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MICHAEL FORTESCUE

Language Relations across Bering Strait

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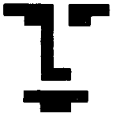
Reappraising the Archaeological and Linguistic Evidence

MICHAEL FORTESCUE



CASSELL
London and New York

Cassell
Wellington House, 125 Strand, London WC2R 0BB
370 Lexington Avenue, New York, NY 10017-6550

First published 1998

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library.

ISBN 0–304–70330–3

Library of Congress Cataloging-in-Publication Data
Fortescue, Michael D.
Language relations across Bering Strait: reappraising the archaeological and linguistic evidence / Michael Fortescue.
p. cm. — (Open linguistics)
Includes bibliographical references (p.) and index.
ISBN 0-304-70330-3 (hardcover)
1. Eskimo languages—Morphology. 2. Aleut languages—Morphology. 3. Uralic languages—Morphology. 4. Languages in contact—Russia (Federation)—Siberia. 5. Languages in contact—Alaska. 6. Languages in contact—Bering Strait. 7. Eskimos—Antiquities. 8. Aleuts—Antiquities. 9. Uralic peoples—Antiquities. I. Title. II. Series
PM50.F67 1998
497'.1—dc21 98-15092
CIP

Printed and bound in Great Britain by Bookcraft Ltd, Midsomer Norton

Contents

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Acknowledgements

During my sabbatical semester at the University of California writing the present book I benefited greatly from discussions with Johanna Nichols, Victor Golla, Marianne Mithun and David Glenn Smith on issues with which it is concerned. I am also grateful to Knut Bergsland, Larry Kaplan, Jeff Leer, Irina Nikolaeva, Jonathan Bobaljik, Irina Muravyova, Juha Janhunen, Yvon Csonka, and Hans Christian Gulløv for constructive comments on all or part of the manuscript and for supplementary information willingly provided. My use of this input does not necessarily reflect their own views as regards the more controversial aspects of this work, but I hope that it at least does not distort that information.

The book is dedicated to all the peoples of the Arctic amongst whom I have had the privilege to conduct fieldwork, and to the late Kay Fortescue, without whom it would most assuredly never have been written.

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Abbreviations

Languages

A	Aleut	In	Inuit
AE	Athabaskan-Eyak	J	Japanese
Ai	Ainu	K	Koryak
Al	Algonquian	Ke	Ket
Alt	Altaic	Ko	Korean
Am	Amuric	Ku	Kutenai
At	Athabaskan	Kwa	Kwakiutl
Au	Alutor	L	Lapp (Saami)
AY	Alaskan Yupik	M	Mongolian (Khalkha)
B	Buryat	Ma	Manchurian
Ba	Baltic	Mo	Mosan
BF	Balto-Finnic	N	Norse
C	Chukchi	Na	Nanai
CA	Coastal Athabaskan	NA	Northern Athabaskan
CAY	Central Alaskan Yupik	NAI	North Alaskan Inuit (Inupiaq)
Ch	Chinese		
CK	Chukotko-Kamchatkan	ND	Na-Dene
		Ne	Nenets (Yurak)
CP	Californian Penutian	Ng	Nganasan (Tavgi)
CSY	Central Siberian Yupik	Ni	Nivkh (Gilyak)
Do	Dolgan	OP	Oregon (& Plateau) Penutian
E	Eskimo		
EA	Eskimo-Aleut	Ost	Ostyak (Khanti)
Ek	Evenki (Tungus)	OU	Ob-Ugric
Es	Enets (Yenisei S)	P	Permic
Ev	Even	Pen	Penutian
Ey	Eyak	PU	Proto-Uralic
F	Finnic	PUS	Proto-Uralo-Siberian
Fi	Finnish	R	Russian
FU	Finno-Ugric	S	Samoyed
G	Germanic	Sa	Salishan
H	Haida	Sc	Scandinavian
Ho	Hokan	Se	Selkup
Hu	Hungarian	Sir	Sirenikski
I	Itelmen	Sl	Slavic
IE	Indo-European	SPI	Seward Peninsula Inuit

ST	Sino-Tibetan	Ur	Uralic
SY	Siberian Yupik	US	Uralo-Siberian
T	Turkic	Ut	Uto-Aztecan
Ti	Tibetan	UY	Uralo-Yukagir
Tl	Tlingit	V	Volgic
Ts	Tsimshian	W	Wakashan
Tu	Tungusic	Y	Yukagir
UA	Ural-Altaic	Ya	Yakut
Ud	Udege	Ye	Yeniseian
Ug	Ugric	Yu	Yupik
Una	Unaliq AY		

Grammatical terms

ABS	absolutive case	LOC	locative case
ACC	accusative case	NOM	nominative case
ALL	allative case	NONWIT	non-witnessed
AN	animate	OBJ	object
ANT	antipassive	OF	object focus
AOR	aorist	PART	participle
CONJ	conjunctive	PASSPART	passive participle
DAT	dative	PASTPART	past participle
FOC	focus	PERF	perfect tense/ perfective aspect
FUT	future		
GEN	genitive case	PERFPART	perfect participle
IMPF	imperfect tense/ imperfective aspect	PL	plural
		POSS	possessive
		PRES	present tense
INDIC	indicative	PROG	progressive aspect
INST	instrumental case	REL	relative case
INT	intentional	SF	subject focus

1 Introduction

The principal purpose of this book is to illustrate how, given a geographical region smaller than a continent but large enough to contain several language families, the suspected genetic and areal affiliations amongst the region's languages can be fruitfully investigated even though any common source appears to lie at a time depth beyond that amenable to the comparative method. This involves applying a particular kind of approach to areal typology in order to extend the limited results of standard methods of reconstruction in the direction of an eventual correlation with what archaeology can tell us of the region's prehistory. The region concerned is the 'Gateway' between the Old World and the New. Various suggestions have been made in the past as to inter-continental linguistic relations here, but none has attained general acceptance (apart from the obvious presence in both North America and Asia of members of the Eskimo-Aleut family). Much would be gained by a grasp of the broader situation - both genetic and areal - even if the ultimate goal of proving some particular hypothesis of genetic relationship according to strict historical criteria may remain elusive. The attempt to fill in this broader picture will, at very least, help elucidate a number of general issues concerning the migration of population groups from the Old World to the New and cast light on how the languages spoken by them came to spread. The book contains much that is speculative - this is inevitable given the subject matter - but the linguistic facts upon which it rests are solid. I have attempted throughout to find a middle way between the cavalier optimism of 'lumpers' and the pessimism of orthodox 'splitters' on matters of deep genetic relationship between the continents.

The basic method I shall be applying is not revolutionary, but represents a synthesis of the historical and typological approaches which may seem unorthodox to some practitioners of both. For them I should stress that I do not regard shared typological features on their own as proof of any kind of historical relationship. My approach consists, rather, of two stages, though I shall present them in overlapping fashion. First I shall push the comparative method as far as I can in attempting to relate the latest linguistic family to have reached North America - Eskimo-Aleut - to Old World language stocks. Then, the number of lexical items reconstructible for the hypothetical proto-language not being sufficient for the case to be considered finally 'proven', I shall scour the wider areal context for accumulations of typologically significant features which may bolster the case for deep genetic relationships - or else indicate substratum/contact interference from plausible sources, traces of which may be geographically far-flung today. I should emphasize that it is precisely the accumulation of such features, not the individual features as such, that is of the essence here. I do not deny that any given feature of a language could have developed internally even if candidates for an areal source exist, or that it could be the result of diffusion even if it theoretically could have developed internally. What adds to the likelihood of remote genetic relationship is simply the sharing of a unique bundle of typological features by the languages concerned. The only stipulations are that the component features do not fall out from some shared general feature (e.g. as postpositions or suffixes do from SOV word order), and that they are not so broadly represented amongst the world's languages as to be of little diagnostic value. Some of these features will be genetically more deeply rooted than others, but I shall not a

priori regard any particular feature(s) as inherently long-lasting (or liable to diffusion)[1]. Others may be the result of diffusion from a common (areal) source, but one of the main purposes of this approach is precisely to pinpoint likely foci for the spread of such features in the wider area, both geographically and in terms of successive linguistic waves that have passed through it.

My use of typology is thus not just to obtain an initial feel for whether the possibility of a historical relationship between isolated and poorly studied languages might be worth investigating (an essential initial stage in any comparative work), but is also intended to extend the partial results such a historical investigation can produce through positing a common typological starting point. This could be either in the form of a hypothetical proto-language or of an areal 'mesh'[2] displaying the typological profile evinced. From this base-line, attempts can be made to explain idiosyncratic structural divergencies in the individual languages or families involved, either through internal development or through interference from neighbouring linguistic entities that display their own distinctive typological profiles.

A further, more general thesis of the book is as follows: thanks to its unique geographical position, straddling the Old and the New Worlds, the Beringian region provides us with a useful test case for observing the differing rates whereby languages and genes move through space and time. Other favourable factors include the sparsity of its population and the relative transparency of successive human movements across it since Land Bridge times, following the dictates of the arctic climate. This is of potential importance for attempts to couple human genetic and linguistic facts anywhere in the world, given the recent influence of the approach of Cavalli-Sforza and his colleagues, according to which the spread of language in early times is essentially equated with the spread of genes (cf. Cavalli-Sforza et al. 1988). For in the case of the region of the present investigation - even though it involves the ancient movements of pre-agricultural hunting people, which ought to reflect this linkage particularly closely - it will be seen that such an assumption is impossible to maintain. I believe that Boas was correct to stress the independence of language, physical type and culture even in remote times (Boas 1911, 5ff).

Actually, Cavalli-Sforza is well aware that languages do not always spread at the same rate as genes (Cavalli-Sforza et al. 1988, 6005), but he explains this in terms of episodes of 'élite domination' (by military invasion or the like), which may cause language replacement in the dominated population, something only conceivable in relatively recent times when such élites had evolved. Neither the 'élite dominance' model nor Cavalli-Sforza's own alternative 'wave of advance' model (let alone the 'system collapse' model), all of which Renfrew (1987, 126ff) adduces in his controversial investigation of the origins of the Indo-European language family, seem to have much relevance when it comes to the movements of small groups of stone-age hunters across the sparsely inhabited Arctic. The 'wave of advance' model favoured by Renfrew is, in particular, triggered by massive demographic buildup of a type much more relevant to the transition to agriculture in Europe. One of the reasons for the popularity of such ideas today in archaeology is the reaction against the unconstrained use of 'migrationist' explanations in the past, much as explaining language differences solely in terms of substrata has fallen into disrepute within mainstream historical linguistics. Yet both migrations (let us by all means call them 'directed expansion' or the like) and the absorption of remnant substratum populations must always have played an important role in the spread of languages and genes in the Arctic, as small

groups of people moved around over large areas in search of limited subsistence resources. The notion of 'substratum' has in fact been revitalized and clarified in recent years, in particular by Thomason & Kaufman (1990), who prefer, however, the expression 'shift-induced interference'.

It is to be hoped that this book will contribute to alerting archaeologists and other non-linguistic specialists in population movements and expansions to the usefulness of linguistic data from specific regions other than Europe and the Near East for constraining their own theories[3].

I shall proceed by first placing the languages with which this book is principally concerned - those that belong to the 'stock' or 'mesh' that I call 'Uralo-Siberian' - into a geographical and prehistoric context; Chapter 1 also contains a broad characterization of their typological nature. In Chapter 2 I shall discuss the main hypotheses that have been proposed in the past linking these languages amongst themselves and to other, external 'stocks'. Chapter 3 then fills in the typological background of the whole region, highlighting those features that prima facie would appear to have potential diagnostic value on either a local or a wider areal scale. The following two chapters investigate the possible morphological elements shared by, respectively, Eskimo-Aleut and Chukotko-Kamchatkan, and Eskimo-Aleut and Uralic (plus Yukagir), the two most plausible wider groupings that have been proposed. Chapter 6 in turn addresses the question of proto-phonology and sound correspondences between all the 'Uralo-Siberian' languages, and presents a sizeable - but hardly overwhelming - number of lexical reconstructions. Chapter 7 sketches a scenario for the prehistoric spread of the Uralo-Siberian languages that draws on the archaeology of the region, and in the final chapter a synthesis of all these ingredients is presented in the form of a discussion of linguistic layering around Bering Strait[4].

1.1. The temporal and spatial framework

The Bering Strait region constitutes what Nichols (1992, 13f.) calls a 'spread zone', through which bearers of successive languages have passed leaving relatively little trace of those that preceded them. Geographically, it also forms a 'bottleneck' - that by which all human beings entered the New World from the Old - and may thus be expected at times to have forced successive linguistic populations into close temporary proximity. By contrast, the adjacent Aleutian and Kamchatkan cul-de-sacs (especially the latter) show certain characteristics of what she calls 'residual zones', where remnants of successive waves over an adjacent spread zone (including language isolates) may accumulate in peripheral pockets of high linguistic diversity. This overall geographical configuration suggests that a combined typological and genetic approach to demonstrating relationships between the languages concerned - separated by thousands of years of unwritten history - may be more fruitful than either of them on its own in trying to reconstruct the linguistic prehistory of the region. In fact, it is my contention that such an approach allows us - without overstepping the ground rules of comparative linguistics - at least to begin to reconstruct the origins of a truly circumpolar language mesh, if not an actual genetic stock, an entity at all events as distinct as the mitochondrial DNA profile displayed by the inhabitants of the Arctic and Sub-Arctic regions of Siberia and North America today (cf. Shields et al. 1993). As we shall see, the match between these two is not exact, but nor, I would claim,

should we expect it to be. The existence today (in completed or partially completed form) of reliable comparative dictionaries for all the individual language families concerned allows the direct comparison of proto-languages, an essential prerequisite for dealing with any degree of confidence with language relationships at this remote time depth.

The spatio-temporal framework of this book is thus the whole of Arctic and Sub-Arctic Eurasia and America, but with primary focus on Alaska and Siberia (the latter including, rather inexactly from a Russian point of view, the Russian Far East), with extensions to the west of the Urals and to the south along the northwest American coast, from about 8,000 BC to the present. This corresponds roughly to Nichols' 'stratum 4' in the colonialization of the Pacific Rim (Nichols 1996, 9)[5]. The whole region that straddles Bering Strait, embracing Chukotka, Kamchatka and Alaska - whether the Beringian Land Bridge was in place or, as was the case during virtually all of the period I shall be focusing on, the rising oceans of the Holocene had replaced it with the narrow strait that divides the continents today - can be referred to as 'Greater Beringia', a designation which no doubt would have pleased the Danish explorer Vitus Bering, after whom the strait and the adjacent sea are named. The Lena river valley is sometimes taken as the western border of this geographical entity (cf. the usage in West 1996), but from a linguistic and ethnographic point of view it makes sense to include Siberia proper within the larger region.

This is harsh territory, in fact the harshest inhabited region on earth. Most of it lies within 1000 miles to either side of the Arctic Circle. Its shores - apart from the Pacific coast of Alaska - are treeless and ice-bound for much of the year, and its interior regions are still colder and bleaker (the high land around Verkhoyansk in Yakutia is the Cold Pole of the northern hemisphere). Much of it is low, flat tundra, broken in Chukotka and Alaska by rugged mountains that alternate with great river valleys. The foggy Aleutian islands have their own, sub-arctic microclimate, as does Kamchatka with its great volcanic peaks and sheltered patches of boreal forest. Precipitation is nowhere great (except on the Pacific coast of Alaska), but the winds are relentless.

Yet there are ample resources for small bands of humans with the skills to exploit the rich marine and riverine life of its shores or to hunt (and in more recent times domesticate) the hordes of wild reindeer that have thronged back and forth on their annual migrations between taiga and tundra since long before man ever arrived in the Far North. Further south within Siberia, the tundra gradually gives way to the coniferous taiga that fills the broad central Siberian plain and all but the highest land of the plateau further east. In the south it is bounded by high open steppeland and - in the center of the continent - some of the world's mightiest mountains. The whole area is traversed by a network of great rivers that converge around Lake Baykal, in size more an inland sea than a lake. Here the climate is still extreme, but mild enough in the short warm summers to support some limited agriculture as well as the grazing of livestock. Some areas - the tundra and the major river valleys - are easily traversed, but elsewhere there are major geographical barriers, notably the high mountain ranges surrounding the central Alaskan basin, and the Verkhoyansk range separating the Lena valley from Chukotka; around these obstacles people on the move have always had to pass. The low Ural mountains to the west, by contrast, are no barrier at all.

The landscape and climate of Greater Beringia has not always been as harsh as it is today, but it has also been colder. Before the global warming of the early

Holocene that led to a general decrease in the extent of glacier-locked ice and a corresponding rise in the level of the world's oceans, the Beringian Land Bridge was exposed over much of the area that the Bering and Chukchi Seas now cover. Owing mainly to the low precipitation of the region, no large ice masses formed, however. This was a low-lying grassland over which megafauna roamed and man followed - at least during those interstadial periods when the Land Bridge was in place and the climate was mild enough for bands of paleolithic hunters to survive. The route human beings followed led always predominantly from west to east, as determined by the relative abundance of the game they pursued. But cross-cutting this general 'drift' was another north-south one, this time determined solely by the fluctuating climate, which punctuated the episodes when it was possible and/or desirable to move eastward across the Gateway to the New World. One of the most significant of these mild episodes was at the height of the Holocene, the so-called Thermal Maximum of about seven to five thousand years ago. The end of this period coincided with the arrival at the Beringian Gateway of the last major expansion of people and languages from the interior of the Old World that would continue on into the New. It is with this expansion that we shall be primarily concerned in the present book.

1.2. The notion of 'Uralo-Siberian' language

At the risk of being seen to preempt in advance the 'stock' as opposed to the 'mesh' conception of the relationship between the languages involved, I shall simply call the hypothetical proto-language (or complex of related languages) out of which all the relevant circumpolar languages may have emerged 'Proto-Uralo-Siberian'. It should be stressed, however, that the positing of such a discrete entity may be an artifact of the comparative method itself. This hypothetical entity, whether stock or mesh, can be taken as representing the core source of all the truly Siberian language families. Before that time Siberia - as opposed to the geographical entity comprising Siberia plus Alaska - did not exist, at least not this side of the last interstadial, when humans first may have ventured so far north as to have been able to cross to America[6]. During the course of the last millennium or so this much ramified entity has gradually been ousted from its original dominance in the area under pressure from new languages - Altaic and Indo-European ones - coming in from the south. The descendants of the hypothetical proto-language that are still spoken today form the following four 'families':

(a) the Uralic languages, comprising two major branches, Finno-Ugric and Samoyedic;
(b) Yukagir
(c) Eskimo-Aleut
and less certainly
(d) Chukotko-Kamchatkan (Chukotkan plus Itelmen)

The last three belong to the so-called 'Paleo-Siberian' or 'Paleo-Asiatic' group first hypothesized in the middle of the last century by L.I. Schrenck as representing the remnants of ancient Siberian languages whose speakers had otherwise been assimilated by encroaching Altaic speakers or displaced to North America (see Skorik 1986, 20)[7].

The reconstructed proto-languages of all these separate groups share certain

almost definitional features that distinguish them from all other surrounding language families, in particular a single voiceless stop series (/p/, /t/, /k/ and sometimes also palatal /t'/ and uvular /q/) corresponding to a single voiced fricative series (/v/, /ð/, /ɣ/ and sometimes also /ð'/ and /R/). This is a typologically rather rare combination, one that reflects either ancient 'consonant gradation' (as reflected still in many Uralic and Eskimo languages, where stops in 'strong' position alternate with the corresponding voiced fricatives in 'weak' position within the word) or at least conditions conducive to its morphological exploitation. See Map 1 for the present distribution of these languages in conjunction with the list of abbreviations at the front of the book (in many areas majority languages such as English and Russian dominate today, of course).

It has been suggested more than once during the course of this century that the languages listed above represent but a selection of a still larger congeries of ultimately related Eurasian languages - this is a matter I shall return to in section 2.5. For the moment let me just state that there is reason to believe that the languages listed above have a closer genetic affiliation to each other than any of them have to any other surviving linguistic family, despite the considerable diversity between their contemporary descendants and despite the typological features held in common by Uralic and Altaic languages in particular. Although I happen to believe that Uralic does share some common genetic kernel with at least some of the languages of the Altaic 'stock', this is far from established today and may never be so to any satisfactory degree. As to still broader affinities, I have no particular opinion - I am simply sceptical of their chances of ever being convincingly proven. As a kind of shorthand - and at the risk of offending orthodoxy on such matters - I shall refer during the course of this book to a number of other controversial language groupings (including 'Altaic' and 'Mosan'); these should be taken as reflecting not proven affiliations but rather 'meshes' that may or may not ultimately reflect common origins, but which at all events lie (for the time being) beyond the grasp of conventional comparative methodology. Though their genetic unity may be unfounded, their accumulation of shared typological features suggests some kind of ancient areal communality at least.

On Table 1 is presented a breakdown of the approximate numbers of speakers of Uralo-Siberian languages today (actually 1970 as regards most groups within Europe). The division into three separate sections for Europe, Asia and America is of course artificial. These figures reflect speakers, not ethnic population as such: especially outside of Europe many no longer use their original language, but have switched to some dominant language like English or Russian. Of the total figures given for Asia and America a further ca. 18% and 15% respectively can be added to cover such groups, though their distribution varies greatly from region to region (also another 267,000 Russian-speaking Mordvins could be added). The vast majority of Uralo-Siberian speakers today speak the three national languages Hungarian, Finnish and Estonian (I have not even included North American immigrants who still speak these as their first language). The figures are taken from Comrie (1981, 279f.), Hajdú (1975), and the 1979 USSR census figures for the Far East given in Fitzhugh & Crowell (1988), adjusted according to the information on the latest (1995) Alaska Native Language Center language map, and with extrapolation from the latest (1995) census figure for Greenland. Relevant sociolinguistic background material concerning all these people can be found in Comrie (1981), Collis (1990), Hajdú (1975) and Fitzhugh & Crowell (1988).

TABLE 1

Numbers of speakers of Uralo-Siberian languages

Europe:	
Uralic	
Finnic	
Lapp (Saami)	31,000[8]
Balto-Finnic	
Finnish	4,800,000
Estonian	962,000
Karelian	2,000
Veps	2,800
Ingrian	200
Livonian	150[9]
Permic	
Zyrian (Komi, incl. Komi-Permyak)	397,900
Votyak (Udmurt)	582,000
Volgic	
Cheremis (Mari)	545,800
Mordvin	983,000
Ugric	
Hungarian	ca. 13,000,000
In all:	21,596,050
Asia:	
Uralic	
Ugric (Ob-Ugric)	
Ostyak (Khanty)	14,600
Vogul (Mansi)	4,000
Samoyedic[10]	
Nenets (Yurak)	24,000
Enets (Yenisei Sam.)	300
Nganasan (Tavgi)	720
Selkup	2,180
Yukagir	260[11]
Chukotko-Kamchatkan[12]	
Chukchi	10,960
Koryak	5,450
Itelmen	100
Eskimo-Aleut	
Siberian Yupik[13]	370
Aleut	10
In all:	62,950

America:	
Eskimo-Aleut	
Aleut	340[14]
Yupik	
Siberian Yupik (St. Lawrence Island)	1,050
Central Alaskan Yupik	10,000
Alutiiq (Pacific Yupik)	450
Inuit	
Alaskan Inupiaq	3,000
Canadian Inuktitut	24,000
Greenlandic (Kalaallisut)	46,850[15]
In all: 83,440	
Total speakers:	*21,744,480*

With the Asian figures compare the ca. 312,000 Yakut, 6,800 Even and 12,070 Evenki speakers according to the 1979 census[16], and with the American ones compare the total figures of 22,570 Northern Athabaskan speakers plus 1,700 Tlingit, 2 Eyak and 300 Haida given on the 1982 ANLC map for Alaska and Canada. These figures have deteriorated rapidly, however - Krauss (1997) has only 12,474 Northern Athabaskan speakers, 575 Tlingit, 1 Eyak and 55 Haida.

1.3. A brief characterization of the Uralo-Siberian languages

In the following I can give only the sketchiest of impressions of the rich - and varied - grammars of the different languages with which this book is concerned. I shall concentrate on important features which they all share, but I shall mention others that contribute significantly to the distinctive profiles of the individual families today. To illustrate the four families and their major branches I shall limit myself to, respectively, West Greenlandic Eskimo and Atkan Aleut, Chukchi and Itelmen, Tundra Yukagir and Nganasan Samoyedic (the major Finno-Ugric languages have been widely described and fall outside of the geographical area of this study). My sources for the material on the tables are Fortescue (1984), Bergsland and Dirks (1981), Skorik (1961), Volodin (1976), Krejnovič (1958), and Tereščenko (1979) respectively. Further useful information of a general nature on all these languages can be gleaned from Comrie (1981), Woodbury (1984), Sinor (1988b), and Skorik (1968).

Phonologically there is on the surface considerable variation between the languages, even within single families, although, as we shall see in 6.1, the reconstructed proto-phonologies are very similar indeed. In general, the Uralo-Siberian families will be seen to have grown gradually further and further apart both grammatically and geographically. There is little evidence of strong mutual influence between the daughter families and languages, let alone convergence of the type that one suspects behind the Altaic languages; by this lucky circumstance my task is somewhat simplified.

Most of the Uralo-Siberian languages have a rather simple consonant inventory, typically with only one stop series and one fricative series by manner, but also often with a palatal (or palatalized alveolar) series by position (see Table 12 in Chapter 6). A voiced series of stops has developed from the fricatives in Samoyedic and Yukagir, and the palatal series has been lost in Eskimo-Aleut (as also in Chukchi and some Balto-Finnic). Unexpectedly, Itelmen also has ejectives (and Aleut and Yupik have voiceless nasals - in Aleut even initial). The presence of uvular phonemes distinguishes the western (Uralic) from the eastern (EA and CK) languages, with Yukagir having acquired them since Proto-Yukagir times (by vowel changes that left uvular allophones no longer always next to back vowels). As regards vowels, the more westerly languages (including Yukagir) have maintained quite a complex array of vowels (including front rounded ones), whereas in the eastern ones this is much reduced (there are only three vowel phonemes in West Greenlandic). Long vowels and/or diphthongs have developed independently in most of the modern languages. Palatal vowel harmony has been largely lost in Samoyedic and is now marginal in Yukagir, whereas Eskimo-Aleut probably never had it. As for Chukotko-Kamchatkan, an unusual form of 'root retraction' harmony has developed (now largely lost again in Itelmen); this will be discussed in 6.1. The canonical shape of morphemes (bisyllabic noun and verb stems but shorter suffixes and demonstrative/ pronominal forms) is similar in most of the languages, as are phonotactic restrictions on clusters (at most two adjacent consonants are usually allowed medially and none word-initially). However, Ob-Ugric, Aleut and - especially - Itelmen have collapsed many originally bisyllabic stems to monosyllables and much more complex clusters have arisen in Itelmen (also to some degree Aleut, Alutor, Kerek and Nenets). As regards morphophonemic alternations, Eskimo-Aleut, Chukotko-Kamchatkan, Samoyedic, and Lapp have, each in their own way, developed a considerable distance away from simple agglutinative beginnings.

The morphology of all Uralo-Siberian (henceforth 'US') languages is essentially a matter of suffixation, although Uralic has shown an increasing propensity to stem-internal inflection, either by consonant gradation (typical of Balto-Finnic) or by vowel ablaut (Samoyedic and Ob-Ugric have both to some degree). Prefixing (also circumfixing) has developed to a considerable extent in Chukotko-Kamchatkan (also Yukagir has a few prefixes). Exclusive reliance on suffixation has been taken to its extreme in Eskimo (West Greenlandic has over 400 productive derivational suffixes and a number of suffixed inflections nearly as great); this is symptomatic of the general increase in degree of morphological synthesis from west to east (out of Eurasia into North America) across the circumpolar region. This drift towards polysynthesis (in its widest sense) has developed via different routes in Eskimo-Aleut (henceforth 'EA') and Chukotko-Kamchatkan (henceforth 'CK'), with EA languages still limited to one lexical stem per word, whereas canonical noun incorporation - arguably a newer phenomenon - is found in Chukotkan (not Itelmen): compare the first sentences under respectively (a) and (b) below. The types of suffixes displayed by Eskimo-Aleut are attested widely throughout the other US languages, however (e.g. morphological valency shifters - causativizers, passivizers, etc. - and aspectual and modality markers, also nominalizing and verbalizing suffixes). All of these are fairly common on a worldwide basis.

Inflectionally, EA has developed unusual double-marking of both head and dependent constituents, e.g. of both possessor and possessum in possessive NP constructions such as **piniartu-p savi-a** (hunter-REL knife-3s) 'the hunter's knife'. The

other languages remain largely dependent-marking (as typical for northern Eurasia). The inflected categories are everywhere limited to nominals on the one hand and verbs on the other, with adjectival concepts being expressed either by ordinary nominals (including participles) in attributive use, or by qualitative verb stems in predicative use; adverbials are either uninflected particles or case-marked nominals.

Nominal categories common to most of the US languages include suffixed number marking to distinguish singular (by zero or a 'singulative' marker), dual, and plural, although the dual has been lost in many European Finno-Ugric languages, as also in Itelmen, Chukchi, West Greenlandic and Sirenikski Eskimo, and presumably Yukagir. The nominative (or absolutive) plural marker is typically not used in combination with oblique case markers (or is replaced by another), and in Yukagir such marking is not obligatory at all. The distinction between nominative and accusative marking is either absent or limited (e.g. to definite and/or singular objects[17]), and in EA and Chukotkan (not Itelmen) the development of ergative clause structure has produced an opposition rather between absolutive case (for intransitive subjects/objects) and ergative/relative case (for transitive subjects). In Chukotkan the latter is the same as the locative or instrumental on nouns, in EA it is the same as the genitive. Most of the languages (except for Ugric and some Samoyedic) have preserved a genitive suffix that plays an important role in their grammars (in CK this is the 'possessive' affix, usually glossed as 'pertaining to' and not included in case paradigms in the standard CK grammars). The fairly simple array of oblique cases typical of US languages has been greatly expanded in the more westerly varieties of Uralic (postpositions have developed further in the east). All the languages except the CK ones have personal possessor suffixes (3rd person only in Yukagir), which may combine with case and number suffixes, sometimes (as in EA and Samoyedic) producing an array of portmanteau morphemes that refers to both possessor and possessum number. Partial paradigms are presented in Table 2 - they include just one typical oblique case, the locative[18], and only the nominative/absolutive case forms of possessed nominals. The EA '4th person' category - i.e. reflexive 3rd - is discussed in 5.1.2. There are no gender distinctions in either nouns or pronouns (but this is typical of the whole region - apart from Russian and Ket).

Less widespread features here include the distinction of two noun classes in CK languages, Class 1 for 'generic and inanimate' referents and Class 2 (containing a historical 3rd person pronoun) for 'specific (animate) individuals' - note that in Table 2 The Chukchi Class 2 plural **Tutun-ti** (from ***Tutun-nti**) refers to the man Tutun's family (Chukchi actually distinguishes a third, mixed class for non-individuated humans). Definiteness is not otherwise commonly marked in US languages (apart from in Hungarian, which has a definite article). There are, however, widespread restrictions on the overt accusative marking of objects, typically limited to definite nouns - in Eskimo this is rather a matter of absolutive versus instrumental object, for definite and indefinite objects respectively (compare the second and third sentences under (a) below). Both nominative-accusative and ergative US languages may have such constructions for indefinite objects. CK languages, for example, have an 'antipassive' construction (like EA), whereas in Samoyedic it is simply a matter of the use of the subjective rather than objective (i.e. intransitive rather than transitive) paradigm, as illustrated in the sentences under (d) below.

TABLE 2

Uralo-Siberian nominal paradigms

Non-possessed

West Greenlandic (stem **qimmi-q** 'dog')

	sing.	pl.
Abs.	**qimmi-q**	**qimmi-t**
Rel.	**qimmi-p**	**qimmi-t**
Loc.	**qimmi-mi**	**qimmi-ni**
etc.		

Aleut (stem **ɬa-X** 'son')

	sing.	du.	pl.
Abs.	**ɬa-X**	**ɬa-x**	**ɬa-s**
Rel.	**ɬa-m**	**ɬa-x**	**ɬa-s**

Chukchi

	Class 1 (stem **qora-ŋə** 'reindeer')		Class 2 (stem **Tutun**, proper name)	
	sing.	pl.	sing.	pl.
Abs.	**qora-ŋə**	**qora-t**	**Tutun**	**Tutun-ti**
Poss.	**qor-en**	(as sing.)	**Tutun-in**	**Tutun-ərɣin**
Loc.	**qora-k**	"	**Tutun-ənə**	**Tutun-ərək**
etc.			etc.	

Itelmen (stem **p'e-c** 'son')

	sing.	pl.
Abs.	**p'e-c**	**p'e-ʔn**
Poss.	**p'e-c-en**	**p'e-ʔiʔn**
Loc.	**p'e-c-enk**	**p'e-ʔn-k**
etc.		

Yukagir (stem **ilə-ŋ** 'reindeer')

Abs.	**ilə-ŋ**	(**ilə-pə**)
Gen.	**ile-n**	(as sing.)
Acc.	**ile-lə(ŋ)**	"
Loc.	**ile-Rə(ŋ)**	"
etc.		

Nganasan (stem **bigaj** 'river')

	sing.	du.	pl.
Nom.	**bigaj**	**bigaj-kəj**	**bika-ʔ**
Gen.	**bika**	**bigaj-ki**	**bika-uʔ**
Acc.	**bika(m)**	**bigaj-ki**	**bika-j**
Loc.	**bigaj-cenu**	--	**bigaj-tini**
etc.			

Possessed (nominative/absolutive)

West Greenlandic (stem **iRniq** 'son')

Possessum number:	sing.	pl.
Possessor		
1s	**iRni-Ra**	**iRni-kka**
2s	**iRniR-it**	**iRni-tit**
3s	**iRniR-a**	**iRniR-i**
4s	**iR(ni)-ni**	**iRni-ni**
1p	**iRniR-put**	**iRni-vut**
2p	**iRniR-si**	**iRni-si**
3p	**iRniR-at**	**iRniR-i**
4p	**iRniR-tik**	**iRni-tik**

Aleut (stem **ɬa-X** 'son')

Poss. number:	sing.	du.	pl.
1s	**ɬa-ŋ**	**ɬa-kiŋ**	**ɬa-niŋ**
2s	**ɬa-an**	**ɬa-kin**	**ɬa-t**
3s	**ɬa-a**	**ɬa-kix**	**ɬa-ŋis**
4s	**ɬa-an**	**ɬa-kin**	**ɬa-t**
1p	**ɬa-ŋin/mas**	(as sing.)	
2d	**ɬa-ðix**	(as sing.)	
2p	**ɬa-cix**	"	
3p/d	**ɬa-a**	**ɬa-kix**	**ɬa-ŋis**
4p	**ɬa-ðix/cix**	**(as sing.)**	

Nganasan (stem **kətu** 'nail')

1s	**kətu-mə**	**kətu-kəj-nʲe**	**kəða-nʲe**
2s	**kətu-rə**	**kətu-kəj-ce**	**kəða-ce**
3s	**kətu-ðu**	**kətu-kəj-cü**	**kəða-cü**
1d	**kətu-mi**	**kətu-kəj-nʲi**	**kəða-nʲi**
2d	**kətu-ri**	**kətu-kəj-ci**	**kəða-ci**
3d	**kətu-ði**	**kətu-kəj-ci**	**kəða-ci**
1p	**kətu-mu?**	**kətu-kəj-nʲü?**	**kəða-nʲü?**
2p	**kətu-ru?**	**kətu-kəj-cü?**	**kəða-cü?**
3p	**kətu-ðuŋ**	**kətu-kəj-cüŋ**	**kəða-cüŋ**

As regards verbal categories, all US languages have suffixed subject and often also object inflections (with 3rd person subject typically marked only by number suffixes). Only the majority of European Finno-Ugric languages lack so-called 'objective' paradigms - these have developed to the fullest in the east, within CK and EA (in the former involving a heterogenous accumulation of prefixes and suffixes, in the latter purely suffixal, as in Uralic). See Table 3 for typical paradigms (aorist or present indicative, 3rd person object only for the transitive), and note the parallel with the

corresponding possessive nominal inflections in Table 2. Indicative paradigms - except in part in CK[19] - are usually based on participles, as marked off on the table by hyphens. More precise temporal indication may be provided by various aspectual (or tense) suffixes. In Nganasan the aorist is probably formed from an old auxiliary verb now fused with the verb stem. Evidential suffixes are also common - except in CK, where particles are used exclusively.

Less widespread verbal features include traces of an inverse construction in the verbal paradigms of CK, where subject-object combinations that break with an agency hierarchy (1st person at the top, 3rd plural at the bottom) are marked by what once was an inverse prefix **næ-/na-**[20] (see the commentary to Map 33 under 3.1.). Also the tense/mood/aspect system of the CK languages is unusually tightly structured (tense and mood paradigms being mutually exclusive and each divided into paired perfective/ imperfective versions - the perfective past or 'aorist' is given in Table 3). Yukagir has developed a unique focus system, involving both focus suffixes on nominal arguments and distinct verbal paradigms depending on which element of the clause is focused upon (subject focus forms, not given in Table 3, are nominalizations with -l or - in the Tundra transitive paradigm - just the bare verb stem). Auxiliary verbs indicating mood, tense or aspect are common in Uralic languages, but otherwise only in Aleut, where this may be a secondary development[21].

TABLE 3

Uralo-Siberian verbal paradigms

Intransitive

West Greenlandic (stem **siniC-** 'sleep')

	sing.	pl.
1	**sinip-pu-ŋa**	**sinip-pu-ɣut**
2	**sinip-pu-tit**	**sinip-pu-si**
3	**sinip-pu-q**	**sinip-pu-t**

Aleut (stem **hila-** 'read', present)

	sing.	du.	pl.
1	**hila-ku-q(iŋ)**	--	**hila-ku-s**
2	**hila-kuX-t**	**hila-kuX-txiðix**	**hila-kuX-txicix**
3	**hila-ku-X**	**hila-ku-x**	**hila-ku-s**

Chukchi (stem **wiri-** 'go down', aorist)

	sing.	pl.
1	**tə-wiri-ɣʔek**	**mət-wiri-mək**
2	**wiri-ɣʔi**	**wiri-tək**
3	**wiri-ɣʔi**	**wiri-ɣʔet**

Itelmen (stem: ɣil- 'drink')

1	t-ɣil-k(icen)	n-ɣil-k(icen)
2	ɣil-c	ɣil-sx
3	ɣil-(ɣ)en	ɣil-(ɣ)eʔn

Yukagir (stem u- 'go, move', verb focus form)

1	(mər)u-jə-ŋ[22]	(mər)u-jə-li
2	(mər)u-jə-k	(mər)u-jə-mut
3	(mər)u-j-Ø	(mər)u-Ø-ŋi

Nganasan (stem **kundua-** 'sleep', continuative present)

	sing.	du.	pl.
1	**kundua-tu-m**	**kundua-tu-mi**	**kundua-tu-muʔ**
2	**kundua-tu-ŋ**	**kundua-tu-ri**	**kundua-tu-ruʔ**
3	**kundua-tu-Ø**	**kundua-tu-gəj**	**kundua-tu-ʔ**

Transitive

West Greenlandic (stem **taku-** 'see')

Object:	3s	3p
Subject		
1s	**taku-a-Ra**	**taku-a-kka**
2s	**taku-a-t**	**taku-a-tit**
3s	**taku-a-a**	**taku-a-i**
1p	**taku-aR-put**	**taku-a-vut**
2p	**taku-aR-si**	**taku-a-si**
3p	**taku-a-at**	**taku-a-at**

Aleut (stem **kiðu-** 'help', present tense)

Object:	3s	3d	3p
Subject			
1s	**kiðu-ku-ŋ**	**kiðu-ku-kiŋ**	**kiðu-ku-niŋ**
2s	**kiðu-ku-un**	**kiðu-ku-kin**	**kiðu-ku-t**
3s/d/p	**kiðu-ku-u**	**kiðu-ku-kix**	**kiðu-ku-ŋis**
1p	**kiðu-ku-mas**[23]	(as sing.)	
2p	**kiðu-ku-ðix**	"	
2d	**kiðu-ku-cix**	"	

Chukchi (stem **pela-** 'leave', aorist)

	3s	3p
1s	**tə-pela-ɣʔan**	**tə-pela-nat**
2s	**pela-ɣʔan**	**pela-nat**
3s	**pela-nan**	**pela-nenat**
1p	**mət-pela-ɣʔan**	**mət-pela-nat**
2p	**pela-tkə**	**pela-tkə**
3p	**na-pela-ɣʔan**	**na-pela-nat**

Itelmen (stem **anja-** 'praise')

1s	**t'-anja-cen**	**t'-anja-ce?n**
2s	**anja-n**	**anja-?n**
3s	**anja-nen**	**anja-ne?n**
1p	**n-anja-cen**	**n-anja-ce?n**
2p	**anja-cx**	**anja-cxi?n**
3p	**n-anja-nen**	**n-anja-ne?n**

Yukagir (stem **ai-** 'shoot')

	Verb focus (any object)	Object focus (any object)
1s	**(mər-)ai-Ø-ŋ**	**ai-mə-ŋ**
2s	**(mər-)ai-mə-k**	**ai-mə-ŋ**
3s	**(mər-)ai-m-Ø**	**ai-mə-lə**
1p	**(mər-)ai-Ø-j**	**ai-l**
2p	**(mər-)ai-m-k**	**ai-m-k**
3p	**(mər-)ai-ŋa**	**ai-ŋu-m-lə**

Nganasan (stem **kontu-** 'carry', past tense)

	3s	3d	3p
1s	**kontu-dʲuə-mə**	**kontu-dʲuə-gəj-nʲe**	**kontu-dʲuə-nʲe**
2s	**kontu-dʲuə-rə**	**kontu-dʲuə-gəj-ce**	**kontu-dʲuə-ce**
3s	**kontu-dʲuə-ðu**	**kontu-dʲuə-gəj-cü**	**kontu-dʲuə-cü**
1d	**kontu-dʲuə-mi**	**kontu-dʲuə-gəj-nʲi**	**kontu-dʲuə-nʲi**
2d	**kontu-dʲuə-ri**	**kontu-dʲuə-gəj-ci**	**kontu-dʲuə-ci**
3d	**kontu-dʲuə-ði**	**kontu-dʲuə-gəj-ci**	**kontu-dʲuə-ci**
1p	**kontu-dʲuə-mu?**	**kontu-dʲuə-gəj-nʲü?**	**kontu-dʲuə-nʲü?**
2p	**kontu-dʲuə-ru?**	**kontu-dʲuə-gəj-cü?**	**kontu-dʲuə-cü?**
3p	**kontu-dʲuə-ðuŋ**	**kontu-dʲuə-gəj-cüŋ**	**kontu-dʲuə-cüŋ**

Finally, as regards syntax, SOV word order is the norm everywhere (outside of most European Finno-Ugric). This is generally fairly flexible (pragmatically determined), except in Aleut; in Chukotkan (and most Alaskan Eskimo) it varies with - and may be in the process of being superseded by - SVO order. In harmony with this feature, postpositions are ubiquitous and modifiers everywhere normally precede their NP heads - except in Eskimo (and to some degree Aleut[24]), where the distinction between modifier and minimal relative clause is blurred. Although subordinating particles are rare (except in CK),there is usually a clear distinction between subordinate and superordinate clause type, the latter being generally based on nominalizations/ participles (though again European Finno-Ugric has developed more Indo-European-like patterns here). EA and Samoyedic have developed some special subordinate mood paradigms. The major superordinate clause types (apart from copular ones, which are variably expressed[25]) are illustrated in the following sentences:

(a) West Greenlandic
Intransitive:
piniartuq taku-sa-qa-lir-unar-puq
hunter.ABS see-PASSPART-have-begin-apparently-3s.INDIC
'the hunter appears to have seen something'

Transitive (erg.):
piniartu-p puisi angu-niar-aluar-paa
hunter-REL seal.ABS catch-try-in.vain-3s/3s.INDIC
'the hunter tried to catch the seal in vain'

Antipassive:
piniartuq immaqa nannu-mik tuqut-si-umaar-puq
hunter.ABS perhaps bear-INST kill-ANT-FUT-3s.INDIC
'perhaps the hunter will kill a polar bear'

(b) Chukchi
Intrans.:
ʔoravetlʔa-t n-ən-u-qinet
man-PL.ABS IMPF-fish-eat-3p.IMPF
'the men are eating fish'

Trans. (erg.):
qeper-e ləɣi-nɣəntev-nin reqoka-lɣən
wolverine-INST really-frighten-3s/3s.AOR fox-ABS
'the wolverine really frightened the fox'

Antipass.:
jara-k tə-pela-tko-rkən
house-LOC 1s-leave-ANT-1s.PRES
'I (generally) leave something in the house'

(c) Yukagir
Verb focus:
tolou-ŋ mə-kelū-j
reindeer-ABS FOC-come-3s
'the reindeer came'

Subject focus:
tolou-ləŋ kelu-l
reindeer-FOC come-3s.SF
'the reindeer came'

Object focus:
ieruce tolou-ləŋ ai-mələ
hunter.ABS reindeer-FOC shoot-3s.OF
'the hunter shot the reindeer'

(d) Nganasan[26]
Intrans.:
əmə? ŋanə?sanə-? məŋ məu-ntənu-nu? nʲilï-tï?
these man-PL.NOM us land-LOC-1p.GEN live-3p
'these men live in our land'

Trans.:
ŋülʲaə tundï-m tandarku-cü
wolf.NOM fox-ACC chase-3s/3s
'the wolf chases the fox'

Indef. object:
koptua səŋülʲi-?ə hualə
girl.NOM look.at-3s.PERF stone.ACC
'the girl looked at a stone'

In order to grasp the great difference between this broad typological profile and that of adjacent, non-Uralo-Siberian languages on the American side of Bering Strait, consider the following characterization of the most prominent features of Athabaskan languages, here specifically Koyukon (examples from Thompson et al. 1983). First, the consonant system is far more complex than anything found within Uralo-Siberian, with 3 series of stops (including ejectives), both voiced and voiceless fricatives, and five different types of lateral. There are traces of an earlier tone system, preserved in some other northern Athabaskan languages.

The morphology of Koyukon is almost entirely prefixing (the exact opposite of neighbouring Eskimo), and its polysynthesis is largely concentrated in the verbal complex, nouns being considerably simpler, with virtually no inflectional marking whatsoever (only prefixed possessor marking[27] and limited collective marking of plural number). This reflects the canonically head-marking nature of Athabaskan languages. The most striking features of its verb morphology are, on the one hand, its highly complex system of stem variation according to mood/tense/aspect (different as between stative and active stems, the latter subdivided into numerous sub-types, each with their own inflectional peculiarities), and, on the other hand, its large number of 'derivational strings' (consisting of one or more discontinuous prefix - often going hand in hand with some inflectional change to the stem), which add specific locational, directional, aspectual or other adverbial meaning to the verb. Interdigitated with these are the subject/object markers, and also overt noun classifier prefixes referring to the type of cross-referenced object or subject (by shape, etc.) which cut across a further complex dimension of covert noun classes[28]. These various elements fall into a large number of 'slot' positions before the stem, including ones for incorporated nouns or postpositions. This is far from the simple cumulative scope relationship between successive affixes in most Uralo-Siberian languages (including the 'logical' recursiveness of Eskimo polysynthesis).

Also typical of Athabaskan languages are its classificatory verbs, unrelated stems with a shared basic meaning ('be', 'move', etc.) that are chosen according to the nature of the subject/object ('living thing', 'long thin thing', 'flat rigid thing', etc.). Basic verbs often have different (suppletive) stems for plural (or even dual) subjects. Some of

these features are illustrated in the two sentences under (e) below, which happen to use the same historical classificatory stem **ton-**, respectively as a 'classificatory motion' and as an 'extension' theme, modified internally for aspect. The **t ɬee** in the first sentence forms a 'derivational string' with its own aspectual requirements, whereas the **t ɬee** in the second (unrelated) is an incorporated subject and **do...di-** is a discontinuous derivational string meaning 'descending over s.th. (e.g. a bank)'.

(e) Koyukon
Active:
hutl t ɬee-gha-s-tee ɬ
sledge out.door-PROG-1s-handle.flat.rigid.object.PROG
'I took the sledge out (through) the door'

Stative:
do-t ɬee-d-ee-tonh
descending.over-trail-descending.over-IMPF-flat.rigid.object.extends.IMPF
'a trail goes down over the bank'

Na-Dene languages in general have a decidedly 'North American', head-marking flavour to them (although they also display numerous idiosyncracies distinguishing them from other Indian languages), in contrast to the typically northern Eurasian features of Uralo-Siberian languages. As will be seen, some of these 'Americanoid' features may nevertheless have been 'picked up' by the easternmost US language families, EA and CK.

1.4. Contact, language shift and small group mobility in the Arctic

One of my prime contentions in trying to piece together the linguistic relationships between Siberia and Alaska will be that in prehistoric times, in this environment, languages have tended to remain relatively conservative and isolated, but to have shown a marked openness to what Thomason and Kaufman (1991, 129ff) call 'normal language shift'. The factors accounting for these 'communicative characteristics' (the term used by Sherzer 1976) surely include the following: extremely low population density and thus relatively little contact with groups speaking completely different languages; a nomadic hunting and fishing life style until recent times (in either an open tundra or taiga forest/river setting); a relatively homogenous level of culture and economic development; and a rather undeveloped sense of linkage between language and ethnic identity. As regards the first point, it may simply be that until relatively recent times nomadic groups in the Arctic were too small and too spread out to have entered easily into situations of prolonged bilingualism, which would probably have been necessary for extensive borrowing (as opposed to shift). Specifically relating to the openness to language shift could be the advantage nevertheless accruing from good communications with other groups who command important but sparse trade commodities or economic niches to which more marginalized groups need to adjust in periods of climatic stress. In such circumstances there is neither the time nor the motivation for the luxury of linguistic convergence[29].

It will be seen that the kind of substratum effects expected from 'normal language shift' can - despite the notorious difficulty of proving that such effects took place in the distant past - go a long way towards explaining the typological diversity of the modern descendants of Proto-Uralo-Siberian. For those readers who regard 'substratum' explanations of linguistic change in general as suspect, I would should stress that I shall be using this word in a very broad sense for a situation of contact-induced change where language shift (without necessarily any lexical traces) can be suspected as the principal mechanism and where at least one reasonable candidate descendant of the hypothetical donor language is still in existence. I shall not distinguish 'substrata' from 'superstrata', since in the temporal and geographical framework of this book the latter term does not seem particularly useful (though perhaps one could talk of a Tungusic superstratum relationship vis-à-vis Yukagir). I am well aware of how complex and indirect such effects can be, as amply illustrated by Thomason & Kaufman - claims of specific substratum effects need to rest not on isolated single features but on the accumulation of a whole series of shared, typologically unusual traits taken from more than one sub-system. The same authors also point out the importance of distinguishing cases of borrowing from cases of shift (although the two can combine). I have followed their advice on both counts.

As opposed to the many known cases of language shift in this part of the world before the arrival of Russian and English (for example of Yukagirs and western Koryaks to Even, of Siberian Eskimos to Chukchi, of eastern Samoyeds to Yakut) there are few cases of outright language mixing or convergence - the famous one of Copper Island Aleut in particular comes to mind. This was the product of a special colonial situation between the native population and the local Russians (see under 8.4). However, as will be discussed at some length in following chapters, the Chukotko-Kamchatkan family as a whole may be said to represent the result of language mixing or at least of strong interference from some unrelated language, probably via a combination of borrowing and shift (especially strong in the case of Itelmen). Vocabulary borrowing - until recent colonial times - appears to have been extensive only in specific circumstances, such as the precarious situation of mainland Siberian Eskimos, dependent on inland Chukchi for essential trade commodities, or when a population has shifted to a new economic basis (e.g. reindeer breeding) without shifting language to that of the people who introduced them to the new way of life (whence the reindeer-associated vocabulary among the Tundra Yukagir, apparently acquired from a small group of Tungusic nomads roaming far to the north). Now the western Uralic languages do indeed display massive lexical absorption from their Indo-European neighbours, the eastern ones have borrowed much from Turkic, and, as we shall see, multilingualism has been widespread for a long time around Bering Strait itself. However, these are exceptions that prove the rule: they involve areas where interaction with - and absorption of or by - neighbours leading different ways of life has at times been intense. I shall argue in Chapter 8 that, all else being equal, it is precisely in 'bottleneck' regions (including off-shore islands, peninsular cul-de-sacs and restricted coastal passages) that one can expect the greatest degree of language mixture or interpenetration.

Comparison with the steppeland 'fast lane' to the south is telling. Here, by contrast with the Siberian taiga and tundra, the communicative characteristics are such as to enhance convergence and exchange of vocabulary. The expedience of ever-changing political alliances between fast-moving, mobile tribes must surely have been

a factor in encouraging multilingualism, something probably lacking amongst the small native populations of the North until recent times when sedentarization and colonially enforced mingling of different ethnic groups, especially in Siberia, was also conducive to multilingualism, but for very different reasons. The picture at the time of first contact with Europeans in the region would appear to have been one of considerable bilingualism on the coasts, where people speaking different languages and engaged in different economic pursuits were in contact - especially around the Beringian Gateway itself. Inland, throughout the vast hinterlands of Siberia and Alaska, bilingualism was probably the exception, although certainly present, evanescently at least, in a number of riverine 'spread zone' locations.

It needs to be repeated that in the Arctic we are always dealing with very small groups of human beings, widely separated from their nearest neighbours. Subsistence by hunting requires a large territory per inhabitant at these latitudes (see Dumond 1987, 36 for a schematic map of population density in the North American Arctic). Nichols (1990, 497f.) gives an estimate of the minimal size of 'tribe' capable of sustaining a stable linguistic community north of latitude 55N. The figure she suggests (about 900) is greater than for many an isolated Eskimo dialect even today (she was presumably referring to languages rather than dialects, however). Certainly, groups of as little as 400 (her 'minimal Arctic tribe') must always have lived close to potential disaster and disappearance. East Greenlandic, whose speakers are spread along portions of the harsh eastern coast of Greenland, is a case in point: it may never have had that many speakers until modern post-colonial times - at least not in one vicinity. In fact it was a population truly in extremis when first contacted towards the end of the last century, at the tail end of the 'Little Ice Age', a fearful society characterized to a greater degree than other Eskimo people by blood feuds and naming taboos. The reasons why that dialect should have developed so rapidly (both phonologically and lexically) when compared to neighbouring West Greenlandic are discussed in Fortescue (1997b); they include subsistence-enforced mobility, isolation from neighbouring 'tribes', and sheer demographic sparsity of population. Literally just before contact, a sizeable group of North-East Greenlanders simply disappeared from the scene - they were seen from an explorer's ship just once, but no contact was made; they had disappeared, leaving only their archaeological calling card, when ships returned later to the area.

Projecting back in time, one should allow for the continual possibility of such events on both sides of the Beringian Gateway. It should also make us wary of scenarios whereby early hunters from Asia are supposed to have been able to wend their way south along the glaciated coasts of Alaska by refuge-hopping in the manner of modern Thule Eskimos crossing Melville Bay south of Thule - a perilous journey at the best of times even for advanced ice-hunters with kayaks and sledges. At least one early migration by this route along the northwest coast of America may indeed have taken place, but only under especially favourable conditions and by people well acquainted with coastal travel already. The Arctic Small Tool people (the probable first ancestors of the Eskimos to appear on the American side of the Gateway) only became fully coastally-orientated by the way (though they doubtless always had boats) in a series of cultural phases that lasted over many centuries.

The whole area is characterized not only by very low demographic density, but also by clearly demarcated language families, only very remotely related (if at all). Language tends to spread more rapidly than genes but more slowly than cultural

artifacts; all three have moved predominantly in the same direction across the Gateway, producing overlaps of the type to be expected from this basic fact. Such conditions are particularly favourable to investigating the dispersal of typological traits over large vistas of time and space, and thus, I believe, the present study can contribute to the crucial question facing typology today in its interaction with historical linguistics: how can we tell the difference between typological features that are 'historical markers' of deep genetic relationship and those that are merely 'areal markers' or, even worse, likely to be the result of universal (e.g. implicational) language-internal developments - and what exactly is the nature of the relationship between these different types of feature?

1.5. Relationship to the original peopling of the Americas: the last wave

This book, then, is concerned essentially with the last wave of linguistic intrusion from the Old World into the New, that for which we have relatively secure ground underfoot (despite the disappearance of the Land Bridge some 10,000 to 12,000 years ago, well before the appearance of speakers of Uralo-Siberian languages in the region!). Preceding it were at least two earlier waves and perhaps several more. Only the waves immediately preceding the Uralo-Siberian one will occupy us to any extent, as the source of various substratum-like features that they left behind. The immediately preceding one probably brought what I shall refer to as the (pre-)Na-Dene[30] language 'stock' - or, better, 'mesh' - which may have been spoken at some stage by the majority of 'real' Beringians, people of the so-called Paleo-Arctic tradition present in the area when the Land Bridge was still in place (Greenberg 1987, 333f. also relates Na-Dene to these people).

There is, however, also evidence of a somewhat earlier North Pacific Rim population, which may have spoken languages remotely related to the 'Mosan'[31] complex of languages of North America that have also left substratum traces in the area, specifically on Kamchatka. As to what came before that - and some evidence points to it having been long before, the entire last episode of the Pleistocene Ice Age having intervened - I shall have little to say, the time depth being far beyond that which would allow one to say anything specific about language relations at this stage. Suffice it to repeat a couple of basic points that others have not been slow to point out in this connection: first, the very diversity of American Indian languages militates at first sight against any archaeological scenario that attempts to compress their entry into the New World into the last 12,000 years or so (the traditional conservative view). Something like 25 to 30,000 (i.e. the time since the last phase of the preceding interstadial period) would seem a priori more reasonable: compare the 'window' of 23 to 28 thousand years ago when the Land Bridge was in place and there was an open passage between the Cordilleran and Laurentide glaciers down through Canada. This was not the case again until, according to some estimates, about 12,000 years ago (cf. Dikov op. cit., 16 and Müller-Beck 1967, 390) - although Worth (1996, 555) interprets new evidence as suggesting that the way was open already by 13500 BP and perhaps even earlier (although it would hardly have been hospitable to traverse). Following up Austerlitz' attempt to explain the imbalance between the great diversity of languages in the New World and the more limited diversity of the Old in terms of successive linguistic stocks being 'drained' from the latter into the former (Austerlitz 1980),

Nichols (1990, 513) estimates a minimum of 20,000 years as the time necessary to account for present diversity given a multiple entry hypothesis, as opposed to ca. 50,000 required by the single entry hypothesis. I would prefer to remain neutral on the question of the dating of the 'first wave' of settlement of the Americas - in 8.1 I shall return to the possibility that 'bottleneck' effects may make the time depth involved appear greater than it really was.

Szathmary (1996, 158), representing modern population geneticists, also opts for an early first entry (between 30 and 20 thousand years ago), based on the estimated time necessary to account for the observed radiation of distinct mitochondrial DNA lineages in the Americas, although unlike Nichols she prefers a single rather than a multiple-entry scenario. Much hinges on whether the founding population was already polymorphic as regards mtDNA lineages, and this limits the direct relevance of such studies to the chronology of successive entries of languages into the New World, since the diversity of American languages may have begun to develop either before or after initial entry. The slender archaeological evidence of human presence in the Americas at that early time is still being vigorously debated (cf. Fiedler 1992, 51ff)[32]. The opening of the Land Bridge for a lengthy period after the climate started deteriorating could, with its abundant fauna, have attracted across it numerous small bands of people who were already roaming the Chukotkan tundra during the warm interstadial.

Secondly, it may or may not be the case that all American Indian languages apart from the Na-Dene ones are ultimately related and represent a unitary first migration into America reflected in the Clovis culture of some 12,000 years ago, as recently argued by Greenberg (1987), following up an idea proposed earlier by Swadesh (1962, 1265). However, the only way to prove anything here would appear to entail abandoning the trodden path of the comparative method entirely, either for controversial 'mass comparative' methods or for a purely typological approach in the manner of Nichols (or Egerod 1991 for the Far East of Asia). As I shall attempt to illustrate, a good deal of mileage can still be gained from a straightforward comparative treatment of at least the 'Uralo-Siberian' group of language families, and its methods should not be abandoned prematurely. Since some of the typological features of at least one earlier wave relevant to this book's topic (that associated with Na-Dene) may have been acquired through contact with still earlier peoples on their way into or already in North America, Nichols' approach in particular will prove useful in attempting to piece together the overall picture. It will be seen, for instance, that later linguistic spreads into the New World may have borne, as she suggests (Nichols 1992, 259), more 'western' typological features with them then earlier ones (which had closer ties around the Pacific Rim). The relationship between Eskimo-Aleut and Uralic languages that I shall be tracing bear this out. My own approach to extending the limits of traditional comparative methods are germane to hers, though I shall be hugging the ground somewhat more closely, focusing on regional features and eschewing any attempt at statistical treatments of the kind she applies on a continental and global scale. My approach is in a sense also more hazardous, since it forces me to posit at least tentative links between typological features and specific language families that may have introduced them in the region.

The particular archaeological 'horizon' in northern Asia with which the Uralo-Siberian expansion into the New World can be associated is the Siberian Mesolithic (or late, transitional Paleolithic), as reflected for example in the Sumnagin culture of the Lena and Aldan valleys. At least one Russian archaeologist, Mochanov, sees the

Eskimo-Aleuts as the direct descendants of the Sumnagins (see references in Dikov 1979, 163)[33]. These people, about whom more will be said in Chapter 7, were fishermen and hunters of wild reindeer about 10,000 years ago who replaced the earlier great game hunters of the Pleistocene tundra associated with the Dyuktai Cave site on the Aldan river. Some Russian archaeologists see the earlier origins of this culture in a migration from the upper Yenisei region (Mochanov 1978, 67); others (notably Dikov 1979, 88ff) sees it as representing a local development from the Dyuktai culture, which dates back at least 18,000 years. At all events, these people - if not their languages - all appear to have their roots in an earlier Siberian paleolithic population of an already discernibly Mongoloid type, such as skeletal remains at Afontova Gora (which dates back some 21,000 years) and still earlier statuettes at Buret' arguably display. These sites cluster along the great rivers between Lake Baykal and the Yenisei and some of them, lacking Aurignacoid blade technology, have been linked to the earlier Mousterian tool industry of eastern Europe (via Mongolia) on the one hand and to the Paleo-Indians of North America on the other. They have been estimated to date back to at least as early as 40,000 years ago, i.e. to the last warm interstadial period (Fiedler 1992, 35)[34]. Of course none of this necessarily says anything about where the language(s) spoken by the Sumnagin and other mesolithic Siberian people ultimately came from - or when.

Dikov himself appears loath to consider a Sumnagin as opposed to a Dyuktai/ Paleo-Arctic source for the Eskimo-Aleuts; the reason may be that the latter represents a more 'advanced' Aurignacoid tradition of bifacial tool (especially blade) makers, which can be regarded as the starting point for the much later Arctic Small Tool microblade tradition associated with the Eskimos, whereas the Sumnagin people (whether intrusive or developing locally) seem to represent a reversal to a simpler Mousterian type of (mainly) unifacial tool makers. However, it should be borne in mind, as Dikov himself points out (following Okladnikov 1964, 23, who did not use these designations, however), that the two different populations lived in very different subsistence environments. The Dyuktai people were specialists in hunting big game (especially mammoth) on the open tundra, where they lived in rather large, sedentary settlements of semi-subterannean dwellings, while the Sumnagins hunted nothing larger than wild reindeer (mammoths, etc., were extinct by about 15,000 BC around Lake Baykal). They were also much more mobile, living primarily in skin tents, and relied heavily on fishing in a riverine forest environment[35]. The shift in tool type may simply reflect this transition from Paleolithic to Mesolithic conditions in Siberia.

The earliest site discovered on the Arctic Ocean, incidentally, is at Berelekh, east of the Lena, dating from around 11500 (to 8500) BC, which lacks Aurignacoid blades but does display traces of some bifacially worked tools. Fiedler (who is still sceptical of a human presence in the Americas earlier than the Clovis culture) sees it at all events as related to the passage of Paleo-Indians towards America (Fiedler 1992, 38). The cardinal point to bear in mind is that, owing to the quirks of geography and climate which left the dry Asian and Beringian tundra largely ice-free while northern Europe was still covered by the Scandinavian ice cap, human beings could move up into the Arctic within eastern Asia before this was possible in Europe.

It seems plausible that bearers of a Ural-Altaic complex of languages (itself far from a homogenous 'stock') moved up from further south into Mongolia, Manchuria and Baykalia (southern central Siberia) with the late Pleistocene/ Holocene warming and the northward return of the forests, some time after the last ancestors of the

Paleo-Arctic people had moved on. Knowledge of the specific Aurignacoid blade technology associated with the latter people ultimately derived, according to Müller-Beck, from the Near East and diffused as far as Kamchatka, Hokkaido and Beringia across the tundra by whatever routes the ice allowed. He descries its presence - albeit in a special local form - at the Mal'ta site of Baykalia (Müller-Beck 1967, 391), C14 dated to 12,800 BC but suspected by some to be much older (see Fiedler 1992, 35). Any new-comers associated with its appearance would probably have been absorbed by residual population groups they encountered en route, a pattern that was later to be repeated several times along the same approximate route into the New World. Hopkins (1967, 480) puts it this way: 'the modern Mongoloid populations, of which Eskimos and Aleuts are a part, evolved during late Wisconsin times (i.e. towards the end of the last Ice Age) in wooded valleys in Transbaykalia and Kamchatka, adapting the Aurignacoid flint and bone-working techniques to the resources of a riverine environment there'. It should be added to this, however, that the original Mongoloid adaption appears - although this is still debated - to have been to a cold, dry climate, pinpointed in time and space by Guthrie (1996, 183) to the 'Mammoth Steppe' stretching to the north of Tibet (and including Mongolia) during the last interstadial[36]. The ancestors of various Paleo-Indian groups - well before Paleo-Arctic times - would have been among the first moving east to the coast if this is so (there are, as we shall see, certain linguistic indications of links at this early stage with the mouth of the Amur river and further south rather than with the Mongolian plateau). Later 'Neo-Mongoloid' people may have developed in situ - or moved back northwards - over a lengthy period of further climatic and genetic change.

It has long been recognized that Eskimo-Aleuts stand apart from other native people of the Americas by various physical indices - e.g. the strong representation of blood type B amongst them (rare in Indians and absent altogether in South America) and their generally more 'Neo-Mongoloid' appearance (cf. Fiedler 1992, 39). What was new in mitochondrial DNA studies in the early 90s was the finding that the non-Na-Dene American Indians are physically somewhat further removed than previously thought from both the Eskimo-Aleuts and the Na-Dene (including the Haida), who in turn share a number of such traits both amongst themselves and with neighbouring 'Paleo-Siberians' of Chukotka (cf. Shields et al. 1993, 557f and Figure 4 in Chapter 8, which is taken from there, also Dumond 1987, 37f.). According to some investigators, the native peoples of America fall into four mitochondrial DNA 'lineages' or 'haplogroups' (reflecting genetic mutations passed on solely in the maternal line - for a summary see Lorenz & Smith 1996). Lineage A is prevalent not only among the Eskimo-Aleuts and the Na-Dene (exclusively so among the Eskimo and - surprisingly - the Haida), but also among various 'Mosan' groups further south and east[37] (it is mixed with B among the Athabaskan Navajos and Apaches of the Southwest). This could represent the result of the mixing not only of Eskimo-Aleuts with (pre-)Na-Dene groups as they entered Greater Beringia, but also of Na-Dene and Mosan populations mingling in still earlier times (this will be discussed further in Chapter 7). However, recent studies distinguish up to ten distinct lineages (variants of A, B, C and D plus two types of 'X'), distributed rather more evenly among native American populations, which would support a single migration, one possibly spread, however, over many millenia (see Merriwether et al. 1996, also Powledge & Rose 1996 for a more popular summary).

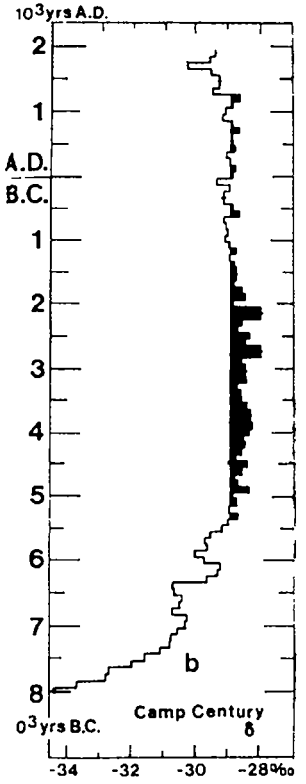
In general, the results of these studies do not unequivocally support Greenberg's

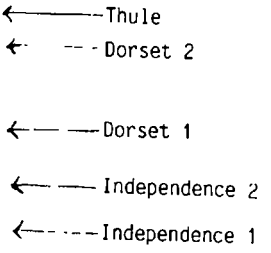
threefold migration (Amerind - Na-Dene - Eskimo-Aleut) model of entry into the Americas. It is principally the linguistic evidence (and its geographical spread) that supports a Na-Dene migration separate from - and later than - the entry of other Amerindians into the New World. The situation appears to have been more complex (even ignoring South America), and may have involved at least four distinct migrations prior to the arrival of people speaking Eskimo-Aleut (if not a single diffuse, protracted one). One must be wary of equating such 'migrations' directly with existing language stocks in America, each of which may have had complex prehistories of movement and mixing before settling in their present positions. Linguists need not worry unduly about the exact number of genetically distinct migrations involved, since, if it is true that language shift may always have been rather common in Greater Beringia (as I argue in this book), the relationship between the four (or more) mtDNA lineages and the four or five linguistic 'waves' that I am suggesting would have been indirect and overlapping at best[38]. My conclusion, as intimated above, is that when the 'last linguistic wave' reached the Beringian Gateway considerable mixing of genes occurred between the newcomers and residual Beringians still in the region, perhaps long after still earlier native Americans had been cut off from the north by an intervening Ice Age stade (i.e. maximum). From the perspective of linguistics the difference between the two last linguistic waves is nevertheless enormous, the two 'stocks' involved being in no demonstrable way related at all - except via the possible contact-induced inheritance of certain typological features. I shall return later to this apparent paradox.

As for the dramatic spread of the 'last wave' across the North American Arctic as far as East Greenland, we are clearly talking about the expansion of ethnic and linguistic Eskimos (or closely related peoples). The phases of this expansion have received detailed investigation at the hands of archaeologists, and much of what can be gleaned from this relatively well charted territory can be transferred to the movements of small populations throughout the Arctic, whenever man has hunted there. Although the bands of people that crossed the Beringian Gateway at various times as they headed east were not the latterday specialized Eskimo hunters we know from the ethnographical literature, they were as much at the mercy of the whims of the arctic climate as the Thule whale-hunters were, who, spreading from northern Alaska about a thousand years ago, undertook the final - and permanent - settlement of Greenland. Now Greenland is disposed geographically so as to resemble an 'arctic fox trap' (Meldgaard 1986, 24) with only one point of entry (Smith Sound between Ellesmere Island and Thule). It is 'open' during relatively warm climatic episodes and 'closed' during colder ones, when the availability of subsistence resources would have been severely reduced and people would not have been able to return the way they had come. The analogy with the Beringian Gateway (only a little further south) should be apparent, although one should bear in mind the differences too: Smith Sound is wider than Bering Strait, but it is also ice-bound much more of the year (in fact crossing by the ice at Bering Strait, with its strong tides, is hazardous even when possible - it is usually undertaken by skin boat during the summer months).

On Figure 1, taken from Petersen and Rix (1982), climatic variation (warmest in the black areas to the right) has been correlated with a particular oxygen isotope's percentage in ice core samples from Greenland's inland ice.

FIGURE 1

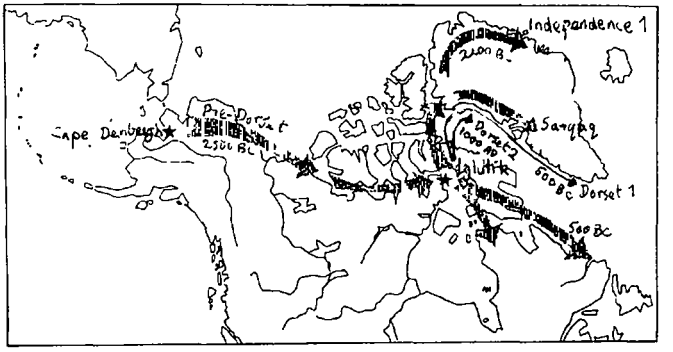




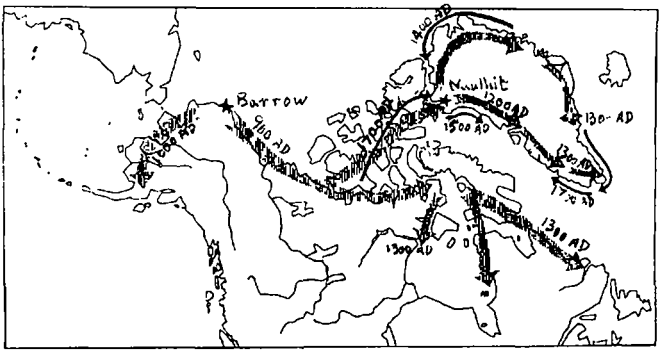
Climatic variation in Greenland
(Petersen & Rix 1982, adapted)

With some reservations this can in turn be compared directly with Figures 2a and 2b adapted from Meldgaard (op. cit.) for the 'Paleo-Eskimo' (pre-Dorset and Dorset) and 'Neo-Eskimo' (Thule) phases of immigration into Greenland[39]. The arrows on Figure 1 are my own, and I have replaced the doubtful arrow tracing Dorset Two to East Greenland on Figure 2a with one for the earliest (Independence One) migration. I have furthermore added arrows for Dorset One but not Independence Two, Note that the earlier pre-Dorset migrations were also followed by cooler periods (though the Arctic was generally considerably warmer during the earliest period of immigration into Greenland than in the last two millenia). It thus looks as if each migration into Greenland (starting with the muskox-hunting Independence One people) occurred during a relatively warm episode and during the subsequent cold one people would have moved south and never have got out again. In fact, all earlier, pre-Thule waves of migration apparently died out in Greenland, leaving those that remained behind in the central Canadian Arctic to retrench (around Iglulik). Only the latest wave left survivors to enter history (at least there are extensive holes in the archaeological record of Greenland following each successive wave but the last). Thus a kind of natural rhythm for successful entry into Greenland is discernible - about once every thousand years[40].

FIGURE 2



2a



2b

Paleo- and Neo-Eskimo migration routes (adapted, Meldgaard 1986)

Such a natural rhythm around Bering Strait could have determined the timing of successive waves of entry into North America from Asia. Compare Nichols' speculative figure of once every two or three thousand years for the entry of a new 'stock' into North America (1990, 503); whether the Paleo- and Neo-Eskimos represent one or two such stocks is still being debated, though the concensus is that there was just one. This could have been manifested in, for example, two major entries for speakers of 'Uralo-Siberian' languages - i.e. either Eskimo and Aleut separately or Eskimo-Aleut as a whole following upon some non-EA Uralo-Siberian language (though the number of actual 'migrations' could of course have been more or less than two). The rhythm hypothesis as regards entry into the New World is perfectly reasonable, but, based on the Greenlandic parallel, one must beware of over-simplification: for a start, the presence of some other group in a 'bottleneck' area like Smith Sound or Beringia might block a potential immigration route for some time. Furthermore, it is not at all proven that the onset of an amelioration of the climate is necessarily a good time to move (or the reverse) - and of course the way beyond Greater Beringia into America was simply blocked by glaciation for long stretches of time. Finally, it can be shown that some of the major entries into Greenland - and therefore probably of those into

North America from Asia - consisted not of massive, monolithic migrations into a virtually empty landscape, but of a number of separate smaller movements and that even between major movement episodes there have been numerous mini-migrations with very specific causes to do with local geography, adaptation to resource harvesting or just plain feuding. Some of these succeeded even under highly unfavourable conditions[41].

On maps 2 through 7 can be seen the successive stages whereby hypothetical Proto-Uralo-Siberian may have spread to produce the distribution of daughter languages we see today on Map 1. The blank spaces on the earlier maps can be taken to have contained languages (or whole families) which have since moved on or disappeared: linguistic variety in the past must have been at least as great in the region as it is today. Detailed commentary must wait until Chapter 7, when the scenario behind the maps will be fleshed out.

Notes to Chapter 1

1. This is in spirit not far removed from Sapir's approach to linking historical and typological considerations. Much more is known today about specific linguistic areas and universal implications between typological features, but his intuitions about aggregates of 'fundamental morphological features' that remotely related languages may still share, however obscured, still ring true, though not all of his proposed language groupings have proved to be equally solid (cf. Sapir 1945, 205). His own tentative conclusion as to which kind of features are most tenacious was in terms of his so-called 'conceptual (mixed- versus pure- relational) type' (op.cit., 145), which lies at a level of abstraction beyond the concrete features I shall be dealing with.

2. This term should be taken as covering any degree of historical relatedness between a group of (once) geographically adjacent languages linked by lexical and/or phonological or structural 'family resemblance'. The possibilities range from Sprachbunds which have drawn unrelated languages into their orbit, through interlocking chains of languages where the ends are unrelated but where there is considerable overlap and actual language mixing in the middle, to traditional language meshes that exclusively involve languages of a single family. Another, crucial intermediate possibility is the situation where all the ingredient languages are ultimately derived from a single ancestral proto-language but the time depth is too great to prove it.

3. At the same time it needs to be more widely recognized that there are dangers attached to the uncritical utilization of taxonomies of genetic relations between languages that happen to be currently widely available. These may include groupings based on very little (if any) solid evidence. I am thinking in particular of such works as Ruhlen (1987), the one linguistic 'model' of the relationship among the world's 5,000 odd extant languages compared by Cavalli-Sforza et al. (1988) with the blood-group based genetic classification of their sample populations. A number of Ruhlen's hypothetical language groupings are disputed (and apt to raise the hackles of specialists). The successive linguistic 'waves' I talk

about in this book should not be equated with any of his broader linguistic groupings - apart from 'Eskimo-Aleut' and 'Na-Dene', about whose distinctness from anything else in the Americas there is general agreement among linguists (I ignore for the moment the thorny question of the relationship of Haida to Na-Dene proper).

4. Note that throughout this book I use the term 'Bering Strait' without the definite article, which is standard usage in scientific (including cartographical) contexts. It probably arose from an earlier 'Bering's Strait', which would have been pronounced the same way (Lawrence Kaplan, pers. comm.).

5. The linguistic 'waves' I shall be talking about, however, do not correspond exactly with Nichols' more abstract typological 'strata'.

6. Of the distribution of hypothetical linguistic stocks in Eurasia at that earlier period we have no knowledge. There is, however, typological evidence suggesting that linguistic strata in North America preceding the one associated with the Na-Dene have affiliations further southwest along the Pacific coast rather than with the interior of the Asian continent. This is a matter I shall return to later. Of course the possibility - even likelihood - of whole language stocks in the area having died out between then and now must also be borne in mind.

7. Schrenck also included the isolates Ket (and other now extinct Yeniseian sister-languages), and Nivkh (Gilyak), sole representative of what may once have been a more extensive Amuric family. Sometimes also Ainu is included. As Russian linguists working on all these languages have stressed, the term 'Paleo-Asiatic' (their preferred variant) is not to be taken as necessarily indicating any genetic unity, but is simply a coverall term for all non-Uralic, non-Altaic native languages of the Russian North.

8. Of which 1,050 in Russia; the latest (1989) census figures give the figure 793 for Saami speakers in Russia, however. The figures given in Collis (1990) are ca. 34,500, of which 1,500 in Russia. Krauss (1997) has only 26,088 speakers of Lapp in all.

9. Far fewer today (Juha Janhunen, personal communication).

10. The 1989 census figures are 26,292 speakers of Nenets, 95 of Enets, 1,061 of Nganasan (but Krauss 1997 gives 28,500, 50 and 500 respectively). These are produced by multiplying total population figures by the percentage who view the language concerned as their mother tongue (where such a figure is available). Krauss (1997) also gives only 1,570 speakers of Selkup (and 12,000 and 3,100 respectively for Khanty and Mansi).

11. The official census figures of 1970 gave 288 speakers, that of 1979 300; I cite the latest official (1989) figures available, although Nikolaeva (pers. comm.) believes that even this is too high, and Krauss (1997) gives only 70. The degree to which bilingual and trilingual Yukagirs actually master their 'first' language is rather uncertain. Dolgykh estimated that there were about 4,500 - 5,000 Yukagirs at the

time of first contact.

12. Krauss (1997) gives 10,000 speakers of Chukchi, 2,500 of Koryak and 200 of Alutor (whereas the figure I quote for Koryak is supposed to include 1,930 Alutors). The figures for the latest (1989) census are actually 4,850 speakers of Koryak and 10,630 of Chukchi. Krauss gives 70 speakers of Itelmen. There are also a few speakers of Kerek left (perhaps no more than two), not indicated separately.

13. This includes about 70 Naukanski and 2 Sirenikski speakers - note that I follow the now widespread ANLC practice of referring to the Naukan and Sireniki languages in these russified forms, although my own preference is for the latter terms (also Chaplino rather than Chaplinski). Official census figures for 1970 gave 785 speakers (also 96 Aleut speakers in the Soviet Union); in 1979 the figures were 500 Chaplinski, 200 Naukanski, and 2 Sirenikski speakers (and 20 Aleuts).

14. This is the figure on the 1995 ANLC map, although Knut Bergsland (pers. comm.) estimates that there are only about 165 fluent speakers left today - the figure given in Woodbury (1984) was 500, that in Krauss (1997) 305 (for Alaska plus Russia).

15. There are perhaps a further 2,000 to 3,000 bilingual speakers permanently resident in Denmark. Greenland is the only place outside of Europe where the number of speakers of a Uralo-Siberian language is actually increasing (and the only native language of geographical North America of which this can be said).

16. For the last two the figures are 7,912 and 10,255 on the 1989 census (compare Krauss 1997, with 7,500 and 30,000 respectively). It also gives respectively 1,088 and 540 speakers of the Paleo-Siberian isolates Nivkh (Gilyak) and Ket (Krauss 1997 gives 400 and 552).

17. In Nganasan both the genitive and (usually) the accusative fall together with the nominative in the singular for one type of noun (with others stem-internal alterations occur). The Samoyedic 'indefinite object' (perhaps better 'new topic') construction illustrated in the last of sentences (d) below is unusual within Uralo-Siberian in so far as it involves the accusative - this may have something to do with the partial conflation of cases here (the distinction between nominative and accusative is often neutralized in these languages). In Yukagir an accusative marker is only used if the subject is also 3rd person and the object non-focused, and the genitive only if the possessor noun is non-specific.

18. Aleut uses postpositions with nouns rather, as does Nganasan with nouns in the dual. All the languages have at least relative/genitive case possessed forms, and Eskimo, Nganasan and - for 3rd person only - Yukagir may also combine these with oblique case.

19. There are also traces of a simple tense-neutral aorist equivalent to the stem in some - especially Samoyedic - Uralic languages.

20. Historically a passive marker, as still found in Itelmen. It is replaced by a 'quasi-inverse' (actually antipassive) equivalent in many Chukotkan paradigms when the object is 1st person.

21. CK languages have auxiliaries of a quite different type for verbalizing - transitively or intransitively - nominalized forms of verbs in certain constructions (see note to 3.1.).

22. The prefix **mə(r)-** expresses actual verb focus (Tundra dialect only); without it the paradigm is best regarded as neutral as to focus.

23. The 1p ending is usually replaced by innovative **-ŋin** today.

24. The divergent aspects of Aleut syntax will be touched upon more than once in this book.

25. As discussed in 3.1, where also the expression of clausal negation is treated: in both cases the same historical morphemes appear widely, in varying degrees of fusion with the nominal or verbal head, resulting in the different surface constructions of the modern languages (see also 5.4).

26. The verbs in these examples are in the tense-neutral aorist (perfective in the third sentence). The intransitive (subjective) form of the verb as in the third sentence is also used with overt pronoun objects and even with possessor-marked noun objects when placed just before the verb. If there is no overt noun object the objective form of the transitive verb must be used (in this case just like Aleut, which, however, always inflects transitive verbs like intransitive ones if the object is overt).

27. These include a 'general' possessor ('someone's'), obligatory on inalienable nouns with no possessor specified, and the two 3rd person prefixes, **ji-** and **bi-**, respectively proximative and distal, which may also occur as object markers in the verb complex. They represent a limited sort of system of obviation, **bi-** acting as an inverse marker within the verb complex.

28. Most subject prefixes stand right before the stem plus associated 'classifier' (actually a voice marker), in other words closer to the stem than all derivational prefixes, another unusual aspect of Athabaskan morphology.

29. Compare the 'worn-down', regularly agglutinative nature of the Altaic languages of the steppe further south (not to mention isolating Chinese), where demographic density and/or mobility are of a quite different order.

30. There is a terminological problem here: Na-Dene in its strict sense (that of Krauss 1976) is today reserved for Athabaskan-Eyak plus Tlingit. However, when I talk of the languages probably spoken on Beringia some 12,000 years ago I am alluding to a common source far earlier than Proto-Na-Dene in this sense and quite possibly involving the ancestor of Haida too, as in Sapir's broader definition of Na-Dene (Sapir 1929) - I shall call this entity 'pre-Na-Dene'. This should not

be taken as meaning that I believe that it will necessarily ever be proven by normal comparative methods that Haida and Na- Dene are genetically related. Lexical replacement over the time-scale involved may have been near total in both branches, only a typologically reconstructible skeleton plus the odd bit of morphology remaining of the common stage.

31. By 'Mosan' I mean the Wakashan, Chimakuan and Salishan language families, which may be still more remotely or indirectly related to Algonquian and Kutenai. That these languages are genetically related is far from proven, although they have much in common typologically - in fact the term 'Mosan' as a genetic grouping is rejected by most specialists today, who see rather areal diffusion as the cause of similarity (cf. Campbell 1997, 210). Denny (1991, 107) likewise sees areal influence on the Columbia Plateau as the source of the morphological similarities between Algonquian and Salishan. The 'Mosan' hypothesis was first posited by Sapir (e.g. Sapir 1929, where he talks of the Algonkin-Wakashan family, in which he includes Kutenai). The term 'Almosan' has since been used by Greenberg and his associates, but is not generally accepted by specialists as a valid genetic grouping. The homeland of the Salishan people was around the mouth of the Fraser River according to Thompson & Kinkade (1990, 45), whence they expanded into previous Penutian territory, especially towards the south, absorbing Penutian speakers in the process. Certainly there are striking differences between the Mosan strip of languages and the less exhuberantly polysynthetic Penutian languages to the south of them that suggest a major historical discontinuity.

32. But note specifically the approximately 13,000 year-old Monte Verde site in Chile, the most likely pre-Clovis site found in the Americas to date, according to Fiedler (1992, 81). It is today widely acknowledged as strong evidence of the presence of man in the Americas before 20,000 BP, given the distance of the site from Bering Strait and the fact that passage between Beringia and the south was blocked between about 20,000 and 13,000 BP.

33. Another opinion is expressed by West (1996, 553), who suspects a link between Sumnagin and the Na-Dene (not on linguistic grounds however).

34. Similar dates have recently been confirmed by radiocarbon dating for Makarovo-4 and Varvarina Gora near Lake Baykal; these sites display a tool kit more sophisticated than anything in Europe at the time and could represent the starting point of the first wave of entry to the New World (Goebel & Aksenov 1995).

35. Note that the use of semi-subterranean houses, though also typical for later arctic people such as the Eskimos, the coastal Chukotkans, the ancestors of the Yukagir on the lower Lena, and certain Uralic people such as the Selkups according to Levin & Potapov (1964, 789 and 588 respectively), is a matter of necessity in such environments and economies. Most of these people lived in tents in the summer. Such features - including the sewing of warm, hooded clothing with the help of bone needles, also attested at some of the earliest Siberian sites - do not on their own say anything about ethnic and/or linguistic affiliations.

36. This correlates with the conclusion of Merriwether et al. (1996) that the source of the founding Amerindian population lies in Mongolia and adjacent Tibet - at least in the common ancestral source of American Indians and the present population of that large area, which contains all of the typical Amerindian lineages (including B, largely absent in Siberia and Alaska today).

37. Note that Mosan population groups are intermediate between the Arctic/Sub-Arctic and more southerly North American native populations as regards the level of mtDNA '9-bp deletion' (and Algonquians are somewhat closer to the latter than Mosans - cf. Lorenz & Smith 1994, 784). Lineage A (lacking that deletion) is quite common in Siberia, whereas B (typified by the deletion, predominant amongst Hokan - especially Yuman - groups in North America, and present in southeast Asia) is absent, suggesting a later entry of the lineage shared by Eskimo-Aleuts and Athabaskans than that typifying Hokan and other southwestern groups.

38. The fact that Eskimo-Aleuts also brought the A lineage with them (like the preceding Na-Dene - and quite possibly still earlier people, since it is present as far away as South America) may simply reflect a 'pool' of lineage A in Siberia, which may well have been in place for a long time (adjacent to Beringia). If, as some geneticists now believe, there was just one early entry into the New World (bearing all four haplogroups), followed by a later reexpansion of those trapped on Beringia during the Ice Age maximum, the relative loss of mtDNA diversity among the populations now speaking Na-Dene and Eskimo-Aleut languages could be explained by isolation.

39. I have changed Meldgaard's date of 900 AD for the first phase of the Thule entry into Greenland (at Nuulliit on Figure 2b) to 1200 AD, according to recently recalibrated Carbon 14 datings, adjusted for the 'Arctic reservoir' effect. This 'wave' followed closely on the heels of the Dorset Two people, who appear to have been in place around Ellesmere Island and Thule from some time before 1000 to about 1300 AD and have 'led the way' for the Thule people. The returning arrows from East Greenland on 2b reflect later movements that brought East Greenlandic traits to the Upernavik and southwest dialects. The movement over the north may reflect rather a fresh wave arriving from Canada and spreading further down the east coast than the west (Gulløv, pers. comm.), but at all events it occurred before the arrival of the Polar Eskimos from Canada around 1700.

    The latest picture emerging of the first appearance of the Thule Eskimos in Greenland involves three discernibly different thrusts into Greenland following close behind the displaced Dorset: first a 'pioneer' group of Birnik seal hunters from North Alaska who mixed with the Dorset underway (it may have been this rather than a first encounter with the earlier inhabitants of the High Arctic somewhere actually in Greenland that brought Dorset traits into the Greenlandic variant of the Thule culture); secondly, groups of whale-hunting people with direct ties to the Punuk people of St. Lawrence Island (associated with sites such as Ruin Island around Ellesmere Island and Thule); and thirdly, groups of 'classical' Thule people of the eastern Canadian Arctic (see Gulløv 1996). None of these

appear to have reached Greenland as early as previously thought.

40. That is if one takes Independence One (Peary Land) and related Sarqaq (west coast) as representing a first major wave starting about 2200 BC, Independence Two (Peary Land) starting around 1300 BC as a second, Dorset One (west coast) as a third about 600 BC (eventually reaching round to the southeast coast) and Dorset Two of the 10th century AD as a fourth. The entry of the Thule people around 1200 AD would be the fifth and last - though it could be seen as filling the same rough temporal 'window' as the fourth. For the advanced Thule culture climate may not have been quite as critical as for the Dorset. As Petersen and Rix (op. cit., 82ff) point out, a warm period is actually unfavourable for a population adapted primarily to hunting on the ice. It was only when they reached southwest Greenland that Thule hunters begin to practise kayak-hunting during the winter months, i.e. when it became possible and/or necessary.

41. The so-called Independence Two cultural phase in Greenland, for example, was actually a series of incursions from Canada (always during optimal climatic conditions in a generally deteriorating era), the last of which may have been identical with the earliest stage of Dorset One (Meldgaard, op.cit., 27). This looks more like a kind of fragmented seepage from the central Canadian Arctic focus of the (pre-)Dorset people, where there was long-lasting continuity, rather than a single massive migration.

    As an example of a mini-migration 'out of season' that did leave survivors in historical times, witness the last group of immigrants to Thule during a particularly cold episode in the middle of the last century. This consisted of just a few families led by a certain shaman Qillarsuaq, who was escaping from his enemies on Baffin Island. It took the group several years to make it to Greenland, and those who chose to return to Canada a few years later all perished. This precarious little migration (and there may have been many similar that never made it through) brought some important cultural revivals with it to the isolated Polar Eskimos at Thule, for example the bow and arrow and the kayak, the use of which had been lost. Interestingly enough, the newcomers do not seem to have influenced the linguistic situation significantly: they were probably too few to do so.

2 Hypotheses concerning the internal and external relations between 'Paleo-Siberian' languages

There has been no shortage of attempts to link the isolated 'Paleo-Siberian' languages[1]change note script one to another and - either singly or in small groups - to known families outside of them. Only in one case, however, that of Eskimo and Aleut, is such a direct genetic link generally accepted as proven. In a second instance, the association of the closely knit Chukotkan group (Chukchi, Koryak, Alutor and Kerek) with Itelmen ('Kamchatkan' or 'Kamchadal') in a Chukotko-Kamchatkan family is accepted with some reservation by most specialists, but is still regarded with scepticism by others. The concensus view today is to regard all other genetic relations that have been proposed among these languages as still unfounded, although certain hypotheses (such as the Eskimo-Aleut-Uralic or the Uralo-Yukagir ones) are regarded as more promising than others. The truth may well be that the time depths between these separate groups may be such as to preclude full 'proof' by traditional - or any other - methods. Before embarking on a detailed investigation into the relationship between the 'Uralo-Siberian' languages, we need to take a look at just how far the individual threads of proposed genetic links among them have been traced today.

2.1. The history of the proof that Eskimo-Aleut is a family

Proving conclusively that Aleut and Eskimo form a genetic family was no mean task, yet without this essential step attempts to relate Eskimo and Aleut to anything further afield had to remain at the level of speculation. The first Russian travellers to reach the region realized that there was some sort of relationship between Eskimos and Aleuts, but this was based on purely physical rather than linguistic facts: also the Koryak and Chukchi were recognized as vaguely representing the 'same' people as them[2]. The gradual plotting out of the actual linguistic relationship between Eskimo and Aleut can be said to have taken well over a century and a quarter, starting with the efforts of no less a figure than the Danish comparativist Rasmus Rask. Already in (approximately) 1819 Rask wrote a short manuscript on the subject, but it had to wait until 1916 for publication, in annotated form (see Thalbitzer 1916, in which the sketch first appeared). What spurred him on to this undertaking was the chance he had to work with two Aleuts who returned with explorer Kotzebue to St. Petersburg. In the manuscript he tried to apply to Aleut and West Greenlandic Eskimo (presumed related on what today we would call typological grounds) the same stringent comparative methods he had used on Indo-European languages with such success, namely the discerning of regular phonological correspondences between the two languages. Among the few morphemes that he compared directly, the most important were the plural suffix **-t**, western Aleut **-s**; dual **-k**, Aleut **-x**; and genitive (relative) case **-p**, Aleut **-m**.

Owing to the paucity of the Aleut material he had to work with (his own notes plus a few early word-lists), he did not get very far. It was only when Aleut received an adequate description with the work of the Russian missionary Veniaminov (1846) that Rask's hypothesis of the genetic relationship between Eskimo and Aleut could be

carried further. Around the same time a few varieties of Eskimo also received more thorough treatment, notably West Greenlandic with Kleinschmidt (1851). During the latter half of the 19th century interest was largely diverted to discussion of the typological character of Eskimo languages - whether they were polysynthetic in the same sense as many North American Indian languages are, as maintained, for instance, by the Danish Eskimologist Hinrik Rink (1891). In the first half of the present century, attention was concentrated on the internal relationship between the growing number of Eskimo languages and dialects that were being described, and to speculations on wider relations between Eskimo and Aleut (still widely assumed to be related) and other language families.

The actual breakthrough, where systematic proof was presented for the genetic relationship between the two branches of the family had to wait until two important articles appeared after the last war, in the Kleinschmidt centenary volume of the International Journal of American Linguistics, by respectively Marsh and Swadesh (1951) and Bergsland (1951). Here was presented a large number of convincing lexical cognates illustrating regular sound correspondences; especially in the second article, common morphological affixes were also subjected to close scrutiny. Since then, Bergsland has published a series of articles deepening our understanding of the details of comparison. In one of these articles (Bergsland 1964) he drew two conclusions, namely that Aleut must have reduced its original case system (in particular losing the equivalent of the Eskimo instrumental), and that the more complex Eskimo verbal paradigms must have developed out of a stage with simpler ones like Aleut, in so far as Eskimo subject/object suffixes (apart from the 3rd person object markers on transitive verbs) still correspond to independent pronouns in Aleut. He later modified this second conclusion, as we shall see, but already in this article he questioned the actual function in the proto-language of the morphemes common to the transitive paradigms of Aleut and Eskimo.

Meanwhile, Swadesh concerned himself rather with trying to calculate the approximate time depth between Aleut and Eskimo. His glottochronological results varied between 2,900 and 4,600 years (the latter figure from 1958), and were subject to criticism by Bergsland and Vogt (1960), who showed that comparison between conservative West Greenlandic and innovative East Greenlandic represented a serious challenge to Swadesh's hypothesis of a constant rate of linguistic change.

Bergsland's many years of work with comparative Eskimo-Aleut culminated in two seminal articles (Bergsland 1986 and 1989). The first of them deals with the sound correspondences between the two branches in greater detail than previously (especially as regards the vowels), illustrated with copious lexical material. With hindsight one can say that it was the far-reaching phonological developments within Aleut that obscured for a long time just how close the two branches of the family actually are. The second compares Eskimo and Aleut syntax - that is the functions of their morphological apparatus. The content of these articles has been integrated into both the recent comparative Eskimo dictionary (Fortescue et al. 1994) and Bergsland's own comprehensive Aleut dictionary (1994). In all, around 510 cognates (excluding common inflectional morphemes) have been unearthed. Lexicostatistically this would suggest a time depth of something in the region of 'only' 4,000 years. Nevertheless, there are profound differences in syntax between the two branches.

Bergsland's interesting new conclusion is that Aleut has undergone some kind of grammatical collapse, perhaps not so long ago, distancing it from the Eskimo-Aleut

proto-language, which must in turn have been closer in most respects to Eskimo today than to Aleut. The cause of this 'catastrophe', whereby a simple phonological merger affecting case inflections (namely relative ***-m**, instrumental ***-mək/-mən**, and locative ***-mi**) may have led to the reinterpretation of Proto-EA ergative morphology as a system of anaphoric reference, will be returned to in 3.3, but for the time being just note that the Eskimo system presupposes the distinction between relative and instrumental case since the ergative construction combines a relative case subject with absolutive object, as opposed to the 'accusative' construction, where the subject is in the absolutive and the object in the instrumental case. With the collapse of the two case markers to **-m**, both transitive constructions would have come to consist of a verb and two arguments, one marked by zero, the other by **-m**, a situation where reinterpretation would have become inevitable.

The basic steps in the 'domino effect' proposed by Bergsland (1989, 73), which resulted in some typologically highly unusual features in Aleut syntax, are: (1) the phonological reduction of final syllables and the ensuing syncretism of locative, relative and instrumental case markers; (2) the collapse of the ergative system (and of the distinction between relative and locative case in postpositional constructions); (3) the development of the unusual Aleut anaphoric reference system from the debris of this collapse, going hand in hand with a strict fixation of SOV word order; (4) the reduction of the portmanteau 3rd person possessor/3rd person possessum suffixes to simple 3rd person forms when the original morphemes began to refer to any anaphoric (non-overt) referent; and (4) the spread of such a referent's own number (including that of a possessor of some overt argument) to the final verb of the (complex) sentence, overriding agreement with the subject (the latter outcome will be illustrated in 8.2.)[3]. In general, it can be said that Aleut has become much more 'syntactic' than Eskimo, with analytic auxiliary verb constructions, for instance, corresponding to 'sentential' verbal suffixes in Eskimo.

This should not be understood as suggesting that Aleut is in all respects innovative compared to Eskimo. Bergsland's other conclusion named above concerning Aleut independent pronouns still holds (although these may in fact have split off from lose attachment to the verb following a common stage of enclisis). Moreover, one important Proto-Eskimo derivational affix, **-u-** 'be', is still an independent stem in Aleut. Bergsland's point is that it is much easier to derive Aleut from something like Proto-Eskimo than it is to derive Eskimo from something closer to Aleut.

2.2. The controversy over the reality of 'Chukotko-Kamchatkan'

Unlike the story of the acceptance of the Eskimo-Aleut languages as a single family, there is still not complete agreement amongst specialists in the Chukotko-Kamchatkan languages as to the nature of the relationship between the two purported branches of the family, Chukotkan and Kamchatkan. Although it has long been recognized that there is some kind of affinity between the two branches (as recognized already by Krašeninnikov 1755, our most valuable source on the languages of Kamchatka soon after contact), detailed comparative work aimed at proving this postulate was never undertaken, and until a few decades ago when the question of the genetic affiliations of Kamchadal (i.e. Itelmen) was mentioned at all it was in the wider context of relations between the so-called 'Paleo-Siberian/ Paleo-Asiatic' languages. Thus Bouda

(1952) attempted to demonstrate a genetic link between the whole group of languages - Chukotkan plus Kamchadal - with Uralic. Some of Bouda's correlations do seem to be sustainable, as is usually the case with such shots in the dark which turn out after all to have been made in the right direction (Swadesh's Eskimo-Chukotkan hypothesis to be discussed in the next section may be another). However, it was a matter of comparing the little known (Proto-Uralic) with the completely unknown (Proto-Chukotko-Kamchatkan), hardly an undertaking likely to stir up much attention in the wider linguistic world.

Despite Bouda's ambitious attempt, progress in clarifying correspondences within the purported family had been very limited by the time of the sixties, with even the one surviving Kamchadal language, heavily russified Western Itelmen, having been accorded only very summary treatment, while the other two Kamchatkan languages sketched by Krašeninnikov were by now long since extinct. This situation led Worth (1962), impressed (or exasperated) by the great lexical differences within Kamchadal and - a fortiori - between these languages and the somewhat better understood Chukotkan ones, to conclude that the unity of Chukotko-Kamchatkan (even of Kamchatkan alone) was illusory and that the chances of recreating Proto-Chukotko-Kamchatkan (if ever it existed) were minimal.

This pessimistic attitude (only slightly mollified by Worth in subsequent publications) prevailed also amongst Russian scholars, notably in the work of Volodin, whose 1976 grammar was the first full-scale scientific description of Western Itelmen. His only mention of the specific problem of placing Itelmen within a wider genetic context were cautious (op. cit., 18), but in later works (especially Volodin 1984, 269) he went further in this direction, suggesting that the crucial core of morphology shared by Itelmen with the Chukotkan languages - of the kind usually regarded as 'proof' of genetic relatedness - was actually due to contact and wholesale borrowing from Chukotkan by some orignally quite unrelated language. Meanwhile, Comrie (1980a) had taken up the challenge posed by Worth and argued that, precisely because of the core morphology held in common, the two branches must be related - if very remotely - as a family. As to the possibility of actually reconstructing Proto-Chukotko-Kamchatkan (PCK), he remained less optimistic. This article contains a useful survey of the controversy up to that point. In another paper (Comrie 1980b) he made the important discovery that CK as a whole retains traces of an 'inverse' construction linked to a person hierarchy, a matter I shall return to later.

With advances in the reconstruction of Proto-Chukotkan, carried forward by Muravyova's 1976 thesis, it became clear that this half of the family was even more closely related than suspected. Thanks to the work of Skorik (1958) and others (e.g. Žukova 1978), the division of that branch into four distinct languages, Chukchi, Koryak, Alutor and Kerek (the latter two having earlier been included in what had loosely been called 'coastal' as opposed to 'reindeer' Koryak) became generally accepted, but still no one ventured further into the historical correlation between this group and Itelmen. I began a few years ago to assemble my own comparative files drawing upon the published sources for all of these languages (Fortescue 1995a represents the state which they have reached at present; see also Fortescue 1997a for reconstructions of core areas of the morphology). With the initiation of a joint project to produce a full-scale comparative Chukotko-Kamchatkan dictionary, which will eventually combine my files with the large body of unpublished lexical data collected by Muravyova, Volodin and others, it can be said that the actual task of reconstructing

what can be reconstucted is well underway. Differences of interpretation remain (i.e. as to whether particular morphemes are cognate or early loans), but these are less important than would have been the case a decade or two ago. In Fortescue (1995a) the base-line for reconstruction is Proto-Chukotkan (PC), with Proto-CK forms reconstructed where possible[4].

Itelmen certainly stands apart from the other languages, both phonologically and lexically, but this could be due to a strong substratum effect. It is my own conviction, having worked for many years on the equivalent Eskimo-Aleut material, that the genetic relationship between Itelmen and Chukotkan is as close as (in fact may in some ways be closer than) that between Aleut and Eskimo, and in the rest of this section I shall try to demonstrate why this is so. One crucial point that will emerge is that numerous Itelmen words that are clearly related to Chukotkan equivalents - whether as loans or as cognates - presuppose regular sound shifts that must have predated Proto-Chukotkan. In such cases there is no simple way of distinguishing early loans from genetic cognates.

First, there is the lexico-statistic evidence: my calculations based on Swadesh's 100 word list shows a conservative 26 out of 98 relevant items held in common by Itelmen and Chukchi (including pronouns but with likely loans from Koryak into Itelmen removed). This should be compared with the 22 out of 98 which Aleut shares with West Greenlandic Eskimo (the figures in Bergsland 1956 for the latter are actually 13 out of 91 - my figure includes four suffixeal cognates and a few items now known definitely to be cognate). Note that according to the usual glottochronological calculations 22% in common is supposed to represent a time depth of approximately 5,000 years while 30% in common corresponds to 4,000 years[5]. One can further set this relationship in relief against the raw numbers of cognates that have as yet been evinced between Chukotkan and Itelmen, as compared with those between Eskimo and Aleut in Fortescue et al. (1994):

TABLE 4

Cognate sets established for PCK and PEA

Proto-Chukotkan: 880 stems plus 54 derivational affixes
Proto-Chukotko-Kamchatkan: 295 stems + 14 deriv. affixes[6]
Percentage of Proto-CK out of PCK + PC (i.e. sets in Proto-Chukotkan with Itelmen cognates) = ca. 20%
Proto-Eskimo: 1,945 stems and derived bases plus 195 suffixes
Proto-Inuit: 544 sets and Proto-Yupik: 448 sets
Of the total, 478 sets have Aleut cognates
Percentage of PE sets with Aleut cognates = ca. 21%
Percentage of PE + PI + PY sets with Al. cognates = ca. 15%

Within EA, a couple of dozen Aleut cognates are with PY (Proto-Yupik) or PI (Proto-Inuit) alone, although it is not always easy to recognize early loans as opposed to cognates here, and these have been subtracted to produce the first percentage. The

second percentage given for Aleut cognates above is in a sense more directly comparable with the Itelmen percentage vis-à-vis Proto-CK, although Chukotkan does not split into two deeply separated sub-branches in the manner of Inuit and Yupik within Eskimo. I have included as 'Proto-Chukotkan' a number of sets attested so far only in Koryak and Alutor (if these - over a hundred - were removed the percentage of cognates would be slightly higher, about 21 rather than 20).

Although the Chukotko-Kamchatkan dictionary has not reached the same level of completeness as the EA one, it is estimated that it will be about two thirds the size of the latter when finished, given the relative richness of the lexical material available. On this basis alone it seems to me that if one is to agree that Aleut and Eskimo form a family (albeit one with a rather low level of lexical correspondence) one is forced to agree that this is also so of Chukotko-Kamchatkan. If Aleut and Eskimo are separated by approximately 4,000 years (a figure on which both Swadesh's and my own lexico-statistical estimates converge), Itelmen could be separated from Chukotkan by about the same time depth - or slightly less. The second line of approach concerns specific sound correspondences that until now have not been investigated (apart from implicitly and/or impressionistically by Bouda and Swadesh). I shall say a few words - and give a few examples - from some of the hitherto most intractable areas here, namely: the source of the Itelmen ejectives and glottal stop[7]; the reflexes of */ð/ and */r/ (also */R/) in Itelmen; and the correspondence between Itelmen stops and corresponding Chukotkan fricatives (also the source of Itelmen voiceless /ɬ/).

Consider then the following list of Itelmen morphemes containing ejectives and glottal stops. In the right hand column I indicate the Proto-CK reconstructions I have proposed for these forms, all of them with clear cognates in Chukotkan (much closer to the starred forms than to the Itelmen and to be found with few exceptions in Muravyova 1976). I group them according to different type of phonological contexts (mainly clusters resulting from loss of a schwa). Examples can also be seen of intervening metathesis of clusters, another widespread phenomenon in Itelmen that complicates the setting up of correspondences.

TABLE 5

The sources of Itelmen ejectives and glottal stop

1) obstruent + continuant	
c'e- 'go into'	(***cəɣæl-**)
c'it 'bow, gun'	(***təritəri**)
əmc'- 'bitter'	(***cəmjə-**, via ***(ə)mcjə-**)
k'e- 'get used to'	(***kæv-**)
k'el- 'go round'	(***kəvlə-**, via ***kvəl-**)
k'im(k'im) 'hair'	(***kəðmir**, via ***kðim**)
mc'emc 'rowan berry'	(***məc-Ral** - redupl.)
pok'o-k'a- 'knock'	(***pek(ə)la-**)
p'ec 'son'	(***pejec**, via ***pjec**)
t'aɬ-k 'far'	(***təðel-**)
t'sal 'fox'	(***taðjola**, via ***tð(ə)jola**)

perhaps also:

c'ec'e-m 'purple willow'	(***qəræqəræ**, via ***tretre** by assimilation)

2) obstruent + continuant prefix (before V)

k'- 'comitative case'	(adverb ***kænmə**, via ***k(C)-**)
q'- 'optative'	(***qə(C)-**)
t'- '1s subject'	(***tə(C)-**)

3) nasal + obstruent

sic'eŋ- 'left'	(***rəŋacəŋ**, via ***riŋceŋ**)
c'aq 'four'	(***ŋəraq**)
c'oq 'three'	(***ŋəroq**)
k'e 'who'	(***mæki**)
k'izvi- 'dry'	(***nə-kərgət-**)
q'ev- 'strong'	(***nə-qiv-**)

4) continuent + continuent

aʔjuvʔaj 'brain'	(***ajwa**, via ***awja**, redup.)
elʔeɬ- 'inform'	(***ðən-ləgælæt-**)
ənqaʔm- 'insult'	(***ðən-Ræqæmæv-**, via ***ðənqæmv-**)
iʔnaq 'ermine'	(***imjaq**, via ***injaq** and ***ijnaq**)

5) loss of voiced lateral before vowel or continuent

feʔa-qɬX 'raven'	(***wælvə-**)
təʔm- 'lick'	(***təmlə-**, via ***təlm-**)
iʔme-məm 'juice'	(***(m)iməl**, via ***ilm**)
-ʔin 'possess. suffix'	(**-linæ**)
leʔl-əm 'dew'	(***lælæl**)

6) final nasal and/or obstruent (+schwa)

maʔ 'where'	(***maŋkə**)
-ʔn 'plural'	(***-ntə**)
ŋuʔn 'here'	(***ŋutəŋ**, via ***ŋunt**)
uʔ 'tree, wood'	(***uttə**)

Recall now the possibility of either a Na-Dene or a Mosan-like substratum on Kamchatka that was suggested in 1.5. One can easily envisage speakers of some such substratum language with glottalized phonemes replacing 'difficult' clusters by corresponding ejectives (or clusters of continuent plus glottal stop) as they switched to Chukotkan[8]. Note that Itelmen verbal stems are predominantly monsyllabic today, as opposed to the bisyllabic Chukotkan pattern (suggesting the syncope of intervocalic vowels, in particular schwa). However, it must be admitted that this could have been an internal development in Itelmen resulting from syncope, although I know of no parallel examples elsewhere where this common process has led to the formation of ejectives. As regards the specific combination of voiceless stop plus voiced fricative, observe that certain Inuit Eskimo dialects (such as Caribou and Netsilik) have developed glottal stop plus fricative for such combinations, a possible intermediate stage. Some nudging effect from a substratum (like that behind the spread of retroflex consonants in Indian Indo-European or clicks in South African Bantu languages) seems likely, whatever the exact mechanism.

Another set of rather complex correspondences involves continuants /ð/, /r/ and uvular /R/ (reconstructible for PC). Usually these correspond to /t/, /z/ and /X/ word-internally in Itelmen, but word-initially they either appear in the same form (but with /s/ for /z/ in the main, Napana dialect) or drop altogether (/R/ may drop also word-internally). The latter process occurs regularly with important transitivizing prefix *ðən-, which is just n- in Itelmen, but rə- in Chukchi word-initially, alternating with -n- when preceded by another prefix. The difficulty here is in knowing whether forms starting with the voiceless fricatives are loans from Koryak or native Itelmen forms. What one can be certain of in most cases is that any word starting with a voiced segment apart from /l/ (and perhaps /z/) is likely to be a loan - except for in the Sedanka dialect, where the voiced equivalents of /s/ and /f/ have been preserved - and that those with zero for these initial segments are native. One can be fairly sure that Itelmen forms with initial /X/ or /x/ like **Xivne** 'wolf' from Proto-CK **(lə)Riɣən(ə)** - Chukchi **ʔinə**, Koryak **Reɣə-lŋən** - are cognates rather than loans since this involves a number of distinct regular correspondences and it is hard to reconstruct a convincing intermediate form in neighbouring Alutor or Koryak from which it could have been borrowed[9]. In other cases, such as stem **Xeqe-** 'bad', it is less easy to be sure that this was not borrowed from Chukotkan ***Ræqæ-**, although there is some evidence that the initial consonant was at some still earlier stage /q/ (in fact at some stage all initial fricatives where probably phonotactically disallowed, as in other Uralo-Siberian languages). Also z-initial words such as **zəl-** 'give' in both dialects are a problem - this stem corresponds to Chukotkan **jəl-** but seems an unlikely candidate for a loan (j-initial loans do exist).

This leads to the more general question of correspondences between initial stops and fricatives in CK. Although usually the correspondences between Chukotkan and Itelmen (non-ejective) stops are one to one, in a good many cases an initial stop in Itelmen corresponds to a fricative in Chukotkan. Thus I **qəl(l)al**, K **RəlRəl** 'snow'; I **qeqeŋ**, C **ʔiŋ(ʔiŋ)** 'nose (of animal)'; I **ktx-**, K **ɣətɣa-n** 'autumn'; and I **°kasf**, K **ɣatte** (from ***ɣatɣa**) 'adze', from respectively ***qəlqəl**, ***qiŋqiŋ**, ***kətɣa**, and ***katɣa**. The change in Chukotkan seems to occur in old reduplicated forms (such as the first and second examples) or when there is another uvular/velar consonant later in the word (as in the third and fourth). In newer reduplications (like C **kitkit** 'a little') this does not occur. Other less regular changes in Itelmen often intervene in such equations, however, as can be seen in the loss of the first syllable-final /ŋ/ in the 'nose' word (also the change of */i/ to /e/, probably by generalization of the 'dominant' form of the stem as vowel harmony broke down), and the 'labialized' (or perhaps more accurately 'pharyngealized') nature of the 'adze' word (the raised 'o' indicates that the whole word is pronounced with some lip and probably also pharyngeal constriction[10]). The same word illustrates also the somewhat more regular development of */t/ to /s/ next to another consonant (the change of */ɣ/ to /f/ - actually [ɸ] - is completely regular in this position). In other cases, however, */t/ goes to /ɬ/, as in **°kəɬf** 'lake', going with Chukotkan **ɣətɣə**[11]. This segment (which may also derive from */l/ next to a voiceless consonant) has a different distribution from that of the similar sound in Chukchi, note, where it represents the usual pronunciation of phonemic /l/. The distributional difference between the two reflexes of */t/ in Itelmen is in part that between adjacency to a stop (where /s/ is usual) and a continuant (where /ɬ/ is normal). Whether the overlap in examples such as the 'lake'

one are due to dialect differences now largely levelled or to more idiosyncratic developments is difficult to say.

Itelmen has also preserved initial /t/ and /p/ in some cases where a stop has been replaced by the corresponding fricative in Chukotkan, as in I **pəs-** 'tie up', going with Chukotkan **vut-**. However, also the reverse occurs when the stop has been fricativized next to a stop (like the */t/ in **skə-** 'make', going with Chukotkan **tæjkə-**), thus I **ft(e)-** 'remain', which goes with Chukotkan **pelat-** (complicated by metathesis and loss of the lateral). In all these cases it is difficult to see ancient loans, since the sound changes involved predate Proto-Chukotkan.

To give an example of how complex - yet essentially regular - the relationship between Itelmen and Chukchi is, I offer on Table 6 a tentative reconstruction of the common word for 'human being' as presented in (Fortescue 1995a), first the Proto-Chukotkan, then the more hypothetical Proto-Kamchatkan[12], and finally their common source in Proto-CK. Note that a prefixed derivative of this word has become the 'official' Chukchi ethnonym **ləɣʔorawetlʔan**, literally 'real human being'. The etymological origin of the word in Chukotkan was already explained in essence by Bogoras (1922, 828) - though not the exact morphemes involved. The term has its origin in mythological conceptions, being used in contrast to the spirit beings, who do not manifest themselves openly like man. Nothing much hangs on this particular etymology (although it appears to be solid) - there are many that are more straightforward, as for example the 'star' and 'freeze' etymologies added below[13].

TABLE 6

Some Proto-Chukotko-Kamchatkan etymologies

PCK **qoraŋvərratəlRən** 'human being'

PC RoraŋvərratəlRən 'human being' [from Roraŋ 'openly' (stem Ruræ- 'appear, come out') plus vərrat- 'appear' and -lRən 'one that -s']
Chukchi: ʔorawetlʔan
Kerek: hujamtalhan
Koryak: RujemtewilRən [reformulated?; Bogoras has ojamja and, in compounds, -mtalRən]
Alutor: Rujamtawilʔən [may be affected by the Koryak; Kraš. has ošamcagal for Karagin]

PK qramralRən 'human being' [cf. Eastern I krosk 'outwards' - for loc. *qoš-k? - in Radlinski, going with Chukotkan Roraŋ above]
W c'amzanʲɬX 'human being' [Volodin also optionally kc'amzanʲɬX, Jochelson qcamzanl]
[and note E kimzanaan 'male' - for *q-? - in Rad., and S uškamzha 'man' - for *-qš-? - in Kraš.]

PCK **ærŋær** 'star'

C arŋatlərŋən 'star' [Bogoras also has ærŋær]
K Pal. erŋer, Kam. arŋaj 'star' [Kr. has Kar. engəš]
Al arŋar 'star'
I erŋez-ecX, ŋezz-ecX 'star' [Kraš. has W agažin, E ezengyn (Radlinski ezegid, ezenic), S ašangyt (Rad. azanid); Sar. as E ežengyc, S azangyd, W ngnešin]

PCK **qitə-** 'freeze'

C qit(ə)- 'freeze (water)' [and qetəkwat- 'feel cold, shiver' qitəqit 'frozen meat']
Ke qəjtə- 'freeze', na-Xəjt-li 'frozen'
K qitə- 'freeze, congeal (blood)'
Al qītə-, Pal qitə- 'freeze'
I qet-et- 'freeze, feel cold, congeal' [Rad. has W iksizic 'freeze' and E kisig 'freezing', kejšizixc 'feel cold']

As regards the 'human being' set[14], note that apart from the unexpected 'recessive' vowel in the first Koryak form (which may reflect a reformulation or be influenced by a coastal dialect where */o/ and */u/ have merged), the sound correspondences are all fairly regular, although this high frequency - yet long - word has undergone contraction in all the languages. Thus the 'glottal stop' of Chukchi (in this position mainly manifesting as pharyngeal constriction and its affect on the following vowel) corresponds to the Koryak pharyngeal[15]; this sound in Chukotkan often corresponds, as we have seen, to initial /q/ in Itelmen. As for the */r/, this goes regularly to /j/ in Koryak (and Kerek but not Alutor, which alone within Chukotkan has retained /r/ distinct from /t/ < */ð/), and, as mentioned above, usually to /z/ in Itelmen. In all languages apart from Chukchi there appears to have been assimilation of /ŋ/ + /v/ to /m/. For the ejective in Itelmen compare the 'purple willow' word in the first section of Table 5 above (/c'/ may thus derive from the cluster */qr/ via */tr/)[16]. As a curiosum note that the Karagin Alutor form (with its regular devoiced reflex of */r/, probably representing **ʔošamtawilʔən** or the like) was related by Krašeninnikov to the source of the Russian deformation 'Kamchadal'.

My general conclusion, then, is that the difference between Itelmen (Kamchadal) and the Chukotkan group of languages, though considerable, does not appear to be any greater than that between Eskimo and Aleut, which form a proven unity.

2.3. Yukagir as a branch of Uralic?

Yukagir is still generally regarded as a language isolate, although the strong case for its genetic affiliation with Uralic has long been recognized. Typologically, the reasons for suspecting a Uralic link are self-evident (only its unique 'grammaticalized focus' system and the presence of a few prefixes are divergent from the typical Uralic profile), but the less than satisfactory descriptive coverage of this small group of closely related languages (typically characterized as 'dialects' until recently[17]) was not

conducive to detailed comparative work after Collinder's seminal work based on the materials at hand at the time (Collinder 1940). Since then, a more solid grasp of the relationship of Samoyedic to Finno-Ugric has also been attained, allowing better comparisons with Proto-Uralic. In a way, Collinder was too successful - since many of the morphological and lexical correspondences he adduced were transparent (and the geographical distance between Yukagir and Uralic would seem to preclude loans) his work was either accepted rather uncritically as a whole by those who pursued this line further (notably Tailleur 1959a and Sauvageot 1969 - Angere 1956 was somewhat more cautious in his assessment) or ignored (notably by Krejnovič 1958, the major descriptive work on the language, based mainly on the Tundra 'dialect', but containing references to the Kolyma variety). Krejnovic - along with other Russian scholars - was sceptical of Yukagir being relatable in a genetic sense to any other language, although he adduced considerable evidence for loans from neighbouring languages, a matter in his opinion of contact alone (in later works his scepticism grew more tempered). Most significantly, he posits strong 'contact' effects on Yukagir of early proximity with Samoyedic, presumably in the Sayan region west of lake Baykal (he also thought he saw still closer links to Yeniseian languages, however). My own attempt to relate Yukagir directly to Eskimo-Aleut (Fortescue 1988a), concentrating on the morphology, was based on this published work (including the fragmentary information on Chuvan and other extinct varieties of Yukagir).

The quality of the material available for comparative work with Yukagir took an important step forward with a thesis by Nikolaeva based on her field work among the Kolyma Yukagir (Nikolaeva 1988a). Here it became clear for the first time that all orthographic renditions of Yukagir hitherto (including the official one used in school materials) had underdifferentiated, since all varieties of the language have a phonemic schwa (albeit of limited distribution) and the Kolyma language has furthermore two distinct varieties of voiced and unvoiced sibilants (palatal and non-palatal, this latter distinction having been lost in Tundra and not noticed in earlier descriptions of the language). In her work she has addressed the problem of reconstructing from all early sources what she calls 'Old Yukagir', which reflects the relationship and distribution of the dialects at the time of earliest contact in the 17th century. Beyond that, she has attempted to reconstruct Proto-Yukagir and compare it directly with Proto-Uralic (cf. Nikolaeva 1988a, 1988b and 1992). Proto-Yukagir is distinguished from Old Yukagir by, above all, the non-phonemic status of uvulars at the former stage (the context of back vowels, later disturbed by vowel shifts, was crucial for their development). In her opinion the basic distinction at that earlier time was between a southern dialect (like modern Kolyma) and a northern one, with modern Tundra representing a northern dialect much affected by contact with Even. She is also working on a long-term project to assemble a comparative Yukagir dictionary in computerized form, now nearing completion. There are numerous aspects of comparative Yukagir in her work that are of interest, but I shall concentrate here on two particularly important areas, both previously subject to considerable confusion: the sibilants and affricates of Yukagir compared with those of Uralic, and its vowel system (including the distribution of schwa). She sees Uralo-Yukagir as an intermediate entity between Proto-Uralic and whatever Nostratic or Ural-Altaic unity lay before that.

The following table (here somewhat simplified) is presented in Nikolaeva (1988b, 83) to illustrate the correlations between Proto-Uralic, Old Yukagir and the modern Kolyma and Tundra languages. Note that the apostrophe henceforth indicates a

palatalized consonant (apart from in Itelmen forms, where I shall continue to use it for ejectives).

TABLE 7

Uralic and Yukagir sibilants and affricates

PU	*s	*s'	*c	*c'	*-nc-	*-n'c'
PY	*ʧ	*ʧ'	*c	*c'	*-nc-	*-n'c'
OY	l,(j),Ø	s'?	c	c'	-nʒ-	-nʒ'-
K	l,(j),Ø	š	c'	c'-,-s'-	-ž-	-ʒ'-
T	l,(j),Ø	s	c'	c'	-r-	-ʒ'-

On the basis of these correspondences, she is able to confirm or reject a number of the cognates proposed by Collinder and others[18]. The distribution of the various reflexes of */s/ in the modern languages (via */ʧ/?) have not been fully worked out yet, although Nikolaeva suggests dissimilation as a partial explanation of why the change sometimes goes all the way to zero word-initially when followed by (a vowel plus) a sonorant, including most importantly /l/ and /j/ (the latter reflex is a secondary development from /l/). */c/ and */c'/ are only distinguished in a few words intervocalically in Kolyma (the distinction is more important in clusters with preceding nasals, themselves lost in modern K and T). Amongst her examples are the following: FU ***s'ala** 'elm tree', K **šal**, T **sal** 'tree'; FU **sula-** 'melt', K, T **ala-** 'melt'; PU ***c'ecä** 'uncle', K **c'ača** 'older brother'; PU ***ic'ä** 'father', K **es'ie** 'father'; PU ***wancV** 'root', K **ožu** 'narrow root (for sewing)', T **varulu** 'root'; and **kun'c'V** 'ant', K, T **köʒ'ə** 'worm, larva'.

The second important area on which Nikolaeva has shed light is the vowel system of Yukagir (see Nikolaeva, forth.). First, she has shown that the diphthongs of Yukagir represent a further development of long vowels, and that these in turn have a secondary origin from short vowels in certain positions of the word - including all monosyllables (see the 'tree' word in the preceding paragraph, for example). The distribution of long vowels is intimately tied up with the distribution of the previously unrecognized phoneme /ə/: in a somewhat simplified fashion one can say that, apart from cases where a long vowel derives from a short vowel plus semivowel (or /ɣ/), lengthening occurs in open syllables followed by consonants plus schwas but no further long vowel. Schwa occurs only in affixes (where they are written like full vowel /e/ in the orthography) or as the final syllable of certain polysyllabic stems (most of which correspond to traditional FU 'e'-stems). The distinction between schwa and full vowel stems has important morphophonological consequences, and the recognition of this phoneme in affixes has considerable potential significance for the reconstruction of Proto-Uralo-Siberian morphology.

The correlation of Yukagir and Uralic vowels, on the other hand, still presents bewildering complexities, but Nikolaeva has also made some progress here, especially as regards the original Uralic vowel harmony system, now largely collapsed in Yukagir. As she shows in for example Nikolaeva (1992, 207), Old Yukagir still had a rather clear distinction between a front and a back vowel series (plus schwa), although

already at this stage */ü/ must have changed to /u/, undermining the regularity of the palatal harmony that applied between the two series in Proto-Yukagir. Furthermore, epenthesis of /i/ or /u/ must already have occurred with many derived forms and inflectional affixes, the choice being independent of the vowel harmony system (thus iŋluɣə 'horror' from stem iŋl- 'be horrified' plus nominalizer -ɣə). Also, generalization of allomorphs of certain common affixes has occurred with long vowels, which now appear with all stems regardless of the quality of the first syllable vowel. Most commentaries on vowel harmony in Yukagir have in fact concentrated on the apparent labial harmony determining allomorphs of certain affixes, but as Nikolaeva points out (Nikolaeva, forth., 18), this is rather a matter of the assimilation-at-a-distance of stem-final schwas.

The original system of Proto-Yukagir appears thus to have been just as in Proto-Uralic: the vowel of the second syllable of stems (and most were bisyllabic) was determined by that of the first. The existence of phonemic schwa beyond the first syllable would further seem to corroborate Janhunen's suggestion that such a sound also existed in this position in Proto-Uralic (Janhunen 1982, 27). In section 6.1 I shall have more to say about Proto-Yukagir phonology.

Apart from the vowel correlations, the major problem that remains for establishing the direct genetic relationship of Yukagir and Uralic is lexical: the number of certain cognates is still not as great as one would hope. This is not in itself surprising given the time depth involved (compare the approximately five or six thousand years that have been estimated to have passed since the break-up of Proto-Uralic, even without taking Yukagir into account - see Maps 4 and 5). The situation has been rendered no easier by the adoption by Yukagir of numerous loans from its Tungusic neighbours which are phonologically not always easy to distinguish from native words. Although many of these can be assigned to relatively recent times - i.e. since the introduction by Tungusic people of a new reindeer-herding way of life among the Tundra Yukagir - the relationship between these two peoples has been entwined for rather a long time, as will be seen in chapter 7.

2.4. Combining the Uralic and Chukotkan hypotheses of Eskimo-Aleut affinity

The first of the two major hypotheses proposed to link Eskimo-Aleut with Old World languages is that linking it with the Uralic languages. The idea actually goes back to at least as early as the treatise written by Danish theologian Marcus Wöldike in 1746, where he compared Greenlandic to the languages of the Old World. His modest conclusion was that only Hungarian had points in common with it and that these languages must once have been adjacent in some vague part of the Old World that he called 'Great Tartary'. Rask (1818), on somewhat more substantive grounds, placed Greenlandic Eskimo in the fold of his 'Scythian' family, comparing the Greenlandic number markers with those of Finno-Ugric and presenting a number of lexical correspondences with Lapp, Hungarian and Finnish (as well as various Turkic languages). It was not until Uhlenbeck in the present century (e.g. Uhlenbeck 1907) that the matter was taken up again; like Rask, he assumed that Uralic and Altaic were related, but in doing so he attempted to distance himself from the traditional genetic versus borrowing dichotomy, envisaging rather an areal model of deep affinity between all these languages as the result of successive episodes of mixing, in a manner more

reminiscent of the position expressed in the present book. His case was based on general grammatical parallels plus a few apparent suffixal and pronominal cognates. Later he turned to the at the time more popular idea of a link between Eskimo and Indo-European, but continued to believe that Eskimo and Ural-Altaic had more in common structurally than it did with Indo-European. This was also true of Sauvageot in his writings (e.g. Sauvageot 1953), where he tried to develop the hypothesis and for the first time drew Yukagir into the picture. But he met strong opposition from the Eskimologists, especially Thalbitzer (1952), who saw the apparent similarities between Eskimo and Chukchi as due solely to an Eskimo substratum behind the latter.

About the same time, Bergsland gathered up the threads of the Eskimo-Uralic hypothesis and added fresh insights of his own (Bergsland 1956 and, especially, 1959). In these articles he concentrated, like those before him, on grammatical and derivational suffixes and mentioned only a hand-full of potential lexical cognates, mainly adduced already by others, e.g. Eskimo **kina**, Aleut **kiin**, Finnish (inflected stem) **ken-** 'who', Eskimo **mannik**, Lapp **monne** 'egg', and Eskimo **kamɐk**, Lapp **gama** 'boot'. But in doing so he illustrated more general points, such as the possible origin of uvular consonants in EA through the loss of earlier vowel contrast (thus he contrasts the 'who' word above with EA interrogatives in **qa-**, which go rather with Uralic interrogative stem **ko/ku-**). He also proposed possible sibilant/affricate correlates in Uralic of the four Proto-EA segments his work with Aleut had led him to posit, 't_1', 't_2', 'c_1' and 'c_2'. He made other important contributions of his own in discussing parallels in the morphology and morphosyntax of the languages concerned. Among the typological features he mentions cautiously as drawing the families together are the possibility of reconstructing double possessor-possessum suffixes of the EA sort also for Uralic (especially Samoyedic), and of relating the EA relative/genitive case marker **-m** to the Uralic definite accusative object marker of that form (Bergsland 1959, 22). This last idea was first mooted by Sauvageot, but was now provided with some motivation by Bergsland's suggestion of an indirect link via the Eskimo instrumental case rather (itself developed from the relative case and used as indefinite object in the Eskimo 'accusative' construction).

As regards the similarity between the Eskimo-Aleut ergative paradigms and the 'objective' verbal paradigms of the Samoyedic and Ugric languages, already pointed out before him, Bergsland suggested that the Eskimo-Aleut transitive construction may have developed from a stage common to EA and Samoyedic by the additional relative/genitive marking of the subject - the genitive, he noted, is common as a subject marker in Uralic non-finite subordinate clauses at least (op. cit., 20). The Proto-Eskimo transitive paradigm might well have been limited to definite or 'stressed' 3rd person objects, as in Samoyedic[19]. He also pointed out that the extreme complexity of Eskimo derivational processes is a secondary development, a matter of degree when compared to Uralic, due largely to the differentiation and recombination of former suffix variants. As regards Eskimo and Finnish geminates he expressed doubt as to their reflecting a common system of 'consonant gradation' (as others had proposed), since their origin in Finnic is at least partly secondary, as is also the case in Eskimo.

In large part independently of these developments, Menovščikov in the Soviet Union wrote a number of shorter articles on the subject (e.g. Menovščikov 1959), where he took a more sceptical view as to whether the similarities actually reflect a genetic relationship.

The possibility that the Eskimo-Aleut family of languages may be related to the Chukotko-Kamchatkan ('Luorovetlan') family on the opposite side of Bering Strait was first seriously addressed by Swadesh (1962)[20], although it had been mentioned in passing by others before him (see Krauss 1976, 231). At least one atempt had already been made to link Chukotko-Kamchatkan with the Uralic languages (cf. Bouda 1951). Swadesh's article is tantalizing and frustrating at the same time. It combines certain crucial insights - in particular as regards pronouns and number marking in the two families - with ad hoc arguments for specific lexical cognates, many of which must be rejected today, given what has been reconstructed for both proto-languages. The edifice of sound correspondences and the reconstructed sound system of his proto-language stands on shaky ground indeed, namely the highly unreliable data for Chukotko-Kamchatkan languages available to him at the time. The main contribution made by Swadesh in this article (apart from the morphological insights mentioned above) was, to my mind, methodological: he proposed a step-wise approach to the comparison of Eskimo and Uralic via a comparison of Eskimo with Chukchi and of Chukchi with Uralic. His conclusion regarding the relationship between Eskimo-Aleut and the nearest language family to it in Asia was by no means meant as an alternative to Rask's Eskimo-Uralic hypothesis (Swadesh 1962, 1265): he saw all these languages (and more) related in the manner of a 'mesh', a notion which I too think appropriate in discussing the relationship among the Uralo-Siberian languages. In fact I shall follow this step-wise approach in the present book, although the broader picture of the nature of linguistic relationships in the region that I shall reach is quite different from Swadesh's.

Over a decade later Hamp returned to this article in a critical review that did not develop Swadesh's ideas any further in terms of new correlations but suggested certain changes in the reconstructed sound system and pointed out which of Swadesh's proposed sets of cognates seemed to be weaker than others (Hamp 1976). My own scepticism towards Swadesh's reconstructions and my interest in the broader Eskimo-(Yukagir-)Uralic hypothesis (Fortescue 1981, 1988 and 1994a) led me to circumnavigate his article as much as possible[21]. Now, after a comprehensive comparative Eskimo dictionary has appeared (Fortescue, Kaplan & Jacobson 1994) and work on a comparative Chukotko-Kamchatkan dictionary is well underway (Fortescue 1995a), I feel it is time to start again down the path sketched by Swadesh, but this time on firmer comparative ground, drawing both Chukotko-Kamchatkan and Uralic (plus Yukagir) into the picture. The obvious starting point is the 1st and 2nd person pronouns, together with the nominal number and verbal subject/object markers that he compared: these represent by far the most convincing aspect of his work in the area. This will in fact provide a way in to the detailed morphological comparisons undertaken in the present book, in Chapters 4 and 5.

Before embarking, I should interject one general caveat about this endeavour. Given the time depth evidently involved and the polysynthetic nature of the languages concerned - in particular the relatively low number of lexical stems as opposed to bound derivational affixes in Eskimo-Aleut - one should not expect to find very many lexical correspondences. As I have argued elsewhere (Fortescue 1992, 246), Proto-EA must have lost a large portion of its previous stock of lexical stems as capitalisation on its highly productive derivational apparatus increased and lexical gaps were filled more and more by derived forms from relatively few stems. With a single exception - an affix meaning 'be' - none of the derivational morphemes of Eskimo languages (several

hundred items in any given dialect) can be related to any Proto-EA stem. The proto-language was already very much like the modern languages today as regards stem/affix balance. Those lexical correspondences which do seem to hold up once one has removed likely loans are relatively straightforward, both semantically and phonologically (the reconstructed EA and CK proto-phonologies are quite similar, and not very different from that of Proto-Uralic either, as we shall see in 6.1), but they are still rather few: 95 reasonably solid Uralo-Siberian sets with reflexes in at least three of the four constituent families (there are many more appearing only in two). This is actually not bad when compared to the less than 200 Sammallahti (also Janhunen) accepts for Proto-Uralic alone, and the 150 Nikolaeva has for Proto-Uralo-Yukagir.

On the other hand, there is quite impressive evidence of ancient genetic communality in the rich morphological systems of all the families involved, the result of processes of grammaticalization stretching across great stretches of time. But precisely because we are dealing here with processes that lead from originally independent stems through enclitics to phonologically and semantically leached affixes, the end product may be obscured by phonological developments (notably processes of reduction) more anomalous than those to which items still lexically independent have been submitted. The net result is a relatively modest yield (as of yet) from the comparison of lexical stems, but considerable yield for potential morphological correspondences. Readers of the present book will be able to judge for themselves whether the case for a genetic relationship between Eskimo-Aleut and either or both the Uralic and Chukotko-Kamchatkan language families has - despite this situation - been substantiated to date.

Many ancilliary arguments of a typological nature can (and should) be added: in a number of ways Proto-CK lies in a typologically intermediate position between Proto-Uralic and Proto-EA, but it also shows a number of typological traits unusual in areal terms, for example its considerable arsenal of prefixes and circumfixes. These need to be explained in terms either of 'natural' developments from a more typologically neutral configuration attributable to some earlier common stage, or as the idiosyncratic result of contact with other languages[22]. In Chapter 3 the typological hinterland will be scoured for help - given the time-depth archaeology suggests we are dealing with when trying to relate the Eskimo-Uralic(-Yukagir) and the Eskimo-Chukotkan hypotheses, we shall need all the help we can muster.

2.5. Nostratic and Eurasiatic speculations

If the 'paleo-linguistic' framework I attempt to establish in this book is to prove extendable, the next logical step, once the reality of a Uralo-Siberian entity is put on lexically firmer ground, would be to address the wider issue of the relationship between this entity and the various Altaic language families (Tungusic in particular). As to the remaining 'Paleo-Siberian' isolates, Ket and Nivkh, these may well prove to be genetically unrelated to Uralo-Siberian in any demonstrable sense. The former seems to have ethnographic and linguistic links both with America and further south within Asia (specifically, perhaps, with Tibeto-Burman), while the latter represents a very ancient population of the lower Amur region, with typological traits pointing in various directions (Comrie 1981, 262 & 266)[23].

Judging from the difficulties that attend the relating of EA, Yukagir and CK to

each other and to Uralic, drawing Altaic languages into the picture may well prove to lie beyond the reach of normal comparative methods, as has often been argued in recent times in relation to the Ural-Altaic hypothesis itself. This goes back to at least as early as Rask (1818), who proposed a relationship between the 'Turanian' (i.e. Altaic) and Finnic languages within a larger 'Scythian' family. The hypothesis was taken up again in the following century by Castrén and others. Certainly the very different demographic and economic conditions of at least the Mongolian and Turkic speaking parts of the Altaic world do not render our chances of ever untangling the linguistic skein at that deep level any easier. For the most cautious of modern attempts to support this link see Poppe (1983), who points out that there are only about 80 plausible common Proto-Altaic items (and far fewer potential Ural-Altaic ones).

Despite the well-known typological similarity between Altaic and Uralic languages there are also some profound traits that separate the former from all of what I have been calling the Uralo-Siberian languages. Thus long vowels and voiced versus voiceless stop series are reconstructible for every branch of Altaic (cf. Poppe 1965, 202 and 197 respectively), but not for any of the four branches of Uralo-Siberian I have proposed - or for the hypothetical proto-language behind them. Of course this could in theory reflect parallel innovations in all the branches of Altaic since a common Ural-Altaic stage (aided by convergence), or else loss of these Ural-Altaic features in Uralo-Siberian alone. Another phonological feature of Proto-Uralic (and other Uralo-Siberian languages) alien to Proto-Mongolian and Proto-Turkic is the presence of a complete palatal series of consonants (it is a recent development in Yakut and Mongolian), although Poppe does reconstruct a proto-Altaic */n'/ on the basis of the Tungusic languages. Altaic languages also lack 'objective' (transitive) verbal paradigms and portmanteau possessor/possessum number affixes (except in most Tungusic, where possessum number precedes possessor much as in Uralo-Siberian, though this is probably a parallel, more recent phenomenon). Moreover, no plural marker - let alone a dual one - can be reconstructed for hypothetical Proto-Altaic. Only Proto-Mongolian shared the US plural marker -t, amongst other plural suffixes (and unlike in most US languages Mongolian plural markers are not limited to the nominative/ absolutive, but may be followed by case markers). Finally, whereas Uralo-Siberian languages generally have rather complex morphophonemics (over and above vowel harmony alternations), all Altaic by contrast remains close to simple agglutination, a situation perhaps reinforced by pressures towards convergence. A more subtle relationship between Uralic and Altaic languages may exist along the lines proposed by Sinor in his later writings (e.g. Sinor 1988), whereby a special relationship (presumably involving a substratum relationship and/or mixing) is posited between the (northern) Tungusic languages and Uralic, independent of a more southerly zone of interaction and/or genetic communality embracing all three branches of Altaic[24].

The formidable difficulties attendent upon attempts to relate Uralic and Altaic and beyond have not deterred the hardy. Since Pedersen (as in Pedersen 1930, 338) first suggested coining the term 'Nostratian' (from Latin **nostrates** 'our countrymen') to cover, open-endedly, those Eurasian language families that might ultimately all be related to Indo-European, others have taken up the challenge with great enthusiasm, notably Illich-Svitych (1971 and later volumes) and his followers after his premature death, mainly in or from Russia. The language families that they consider to be related include a core consisting of Indo-European, Uralo-Yukagir, Altaic, Afro-Asiatic, Kartvelian (southern Caucasian), and (at least for some) Dravidian; others, going

beyond 'canonical' Nostratic, would expand this to include Chukotko-Kamchatkan, Eskimo-Aleut, and even Nivkh[25]. This 'superstock' is typically contrasted with a Sino-Caucasian-Na-Dene one (an idea - minus the Caucasian part - attributed originally to Sapir), covering most of the other languages of Eurasia plus Na-Dene (and including Basque and Yeniseian, but not the Austronesian and Austro-Asiatic languages of Southeast Asia; cf. Starostin 1982, 197ff). Some Nostraticists tend now to see also Nivkh and Chukotko-Kamchatkan as belonging here rather than with Nostratic (cf. Nikolaev & Mudrak 1989). Sound correspondences are sought, but they remain speculative and rather imprecise in detail, based on very few tentative exemplars and very liberal semantics. Also Uhlenbeck (1935), arguing for an Eskimo-Indo-European link, and Thalbitzer (1952) who followed him pursued similar strategies. In fact Swadesh belongs in this company too, having tentatively related 'Uraltaian', Ainu, Gilyak (Nivkh), Sumerian, Eskimo-Aleut and even Wakashan (Swadesh 1962, 1266). And in the wake of his controversial application of mass comparative methods to the languages of America, Greenberg has also turned his attention to the Nostratic world - though his 'Eurasiatic' is not identical with the latter - in an ongoing investigation which applies the same methods to the language families that the author relates to Indo-European, namely Uralic, Altaic, Yukagir, Eskimo-Aleut, Chukotko-Kamchatkan, Ainu, Japanese, Korean and Nivkh (Greenberg, forth.). For a more sceptical attitude more typical of recent times see Rédei (1988b), who regards the few potential 'Nostratic' lexical items apparently shared by IE and PU as being due to early loans from the former into the latter.

As will grow clearer throughout the rest of the present book, I share with the Nostraticists one belief: that most of the languages of Siberia belong either to the same 'stock' as Eskimo-Aleut (my Uralo-Siberian stock/mesh), in turn remotely related to the Altaic language families (at least Mongolian and Tungusic), or to a Yeniseian-Na-Dene stock/mesh, perhaps further related to Tibeto-Burman[26]. I differ from them in not seeing any solid grounds for extending these 'stocks' further west into Europe or south into India. In one respect I also sympathize with (but do not condone) the mass-comparative approach: even within the spatial and temporal frame to which I have limited myself here, inter-linguistic relationships may be more of the nature of a 'mesh' than of a classical 'Stammbaum', in which case the very notion of a unitary proto-language may be illusory (see Fortescue 1988a for a suggested model more suitable to the languages of nomadic hunter-gatherers in the Arctic). In a somewhat different vein, Nichols (1992, 23f.) points out that the traditional family tree model is better suited to spread zones than to residual zones, where contact and substratum effects may build up and be criss-crossed by local diffusion (she regards the whole of the North Pacific Rim as a residual zone). For a cogent defence of the traditional approach to such matters, applied to an adjacent linguistic area, namely Manchuria, see Janhunen (1996, especially Chapter 6)[27].

Nevertheless it seems to me that there is a useful intermediate perspective between the quasi-certitudes of historical reconstruction within already well established families and the global view where everything may just as well be related to everything else. Thus if I now and then revert to such vague designations as 'Ural-Altaic', this should be understood as referring to the common lexical and grammatical core - however inaccessible to precise reconstruction - around which the various Uralic and Altaic languages may have formed by complex, repeated processes of peripheral or substratum mixing with adjacent languages (the same goes for 'Mosan' and 'pre-Na-

Dene' on the American side). The further back in time one goes (especially when dealing with nomadic, pre-agricultural people) the less determinate does the exact linguistic ancestry of a given modern language become - that is, if one accepts the possibility of successive episodes of language mixing and/or shift. I do not myself believe that 'mass comparison' methods (where lexical look-alikes from all the languages concerned are directly compared without detailed phonological correlations) would improve the focus of the picture within the framework I have chosen. Nor indeed are they needed in order to show that there are good grounds to suggest some form of genetic communality here. In fact they would tend to obscure the especially close relationship between the Uralo-Siberian languages as opposed to the other languages of Eurasia (which may very well ultimately be related of course).

What is generally accepted by linguists of all persuasions working in this area, however, is the notion that Eskimo-Aleut must represent the latest language family to have entered the New World during prehistoric times (and Na-Dene the next to last - compare thus Greenberg 1987, 334). If one defines the 'Nostratic' languages as those showing evidence of an original 1st person marker ***m** and a 2nd person marker ***t** (as one is tempted to when looking for what really is common to all of them), then Yukagir, Chukotko-Kamchatkan and (somewhat less obviously) Eskimo-Aleut would certainly seem to belong in the fold. Ironically, the morpheme Nostraticists and mass-comparativists typically choose to show the purported EA reflex of 1s **-m** is relative case form **-ma**, the /m/ of which has nothing to do with the 1st person: it is the relative case marker, to which 1s **-ŋa** has been added[28]. As it happens, the latter morpheme can be analysed at a deeper historical level (pre-EA) as the result of the amalgamation (plus assimilation) of preceding pronominal stem **(tə)k-** plus ancient 1s marker ***-m** and a deictic morpheme **-a**, as will be seen in 4.1.2.

Notes to Chapter 2

1. As defined under 1.2 - not to be confused with my own term 'Uralo-Siberian'.

2. For this reason the Pacific Coast Eskimos of Alaska still call themselves **Alutiit**, literally 'Aleuts', the name given indescriminately to both groups by the Russians.

3. A number of the other syntactic 'oddities' of the language can probably be related to these events, namely the syncretism/redistribution of originally transitive or intransitive participles as the clear morphological distinction between transitive and intransitive clause became blurred; the obscuring of the originally clear distinction between superordinate and subordinate clause paradigms; and the loss of the purely nominalizing function of Proto-EA affix ***-neq**, which now entered instead into various participial and adjectival constructions.

4. Proto-Kamchatkan sets with no known Chukotkan cognates are kept separate and reconstructions not hazarded, owing to the poor quality of data apart from that available now for the modern western language.

5. By way of comparison note the 13-15% of basic vocabulary estimated by Hajdú to be held in common between Finno-Ugric and Samoyedic: this represents a time depth of 6,000 years (Hajdú 1975, 50). The 26 items I have positively marked

between Chukchi and Itelmen are: 'I', 'we', 'thou', 'who', 'there', 'fly', 'night', 'all', 'star', 'stone', 'tree', 'fish', 'woman', 'blood', 'ear', 'egg', 'tail', 'hear', 'eye', 'skin', 'heart', 'neck', 'liver', 'eat', 'cold', and 'kill' (a few of which may yet turn out to be loans). This does not even include 'man', despite the 'human being' set of Table 6, though this and up to 12 other items on the 100 word list I would in fact regard as in all likelihood representing cognates in the two languages ('ashes', 'dog', 'hair', 'long', 'mountain', 'foot', 'bone', 'green', 'red', 'walk' and 'warm').

6. There are also 342 unreconstructed Proto-Kamchatkan sets in Fortescue (1995a).

7. The former were regarded by Swadesh as belonging to Proto-Chukotko-Kamchatkan, and indeed to the common source of EA and CK; the glottal stop was treated by Volodin 1976 - cautiously - as being prosodic rather than phonemic. Certainly the distribution is very different from the glottal stop in Chukotkan languages, but it is - as there - always associated with specific morphemes, both stems and affixes. The orthographic combination with a final /n/ at least represents a phonetic ejective /n/ (J. Bobaljik, pers. comm.).

8. It is not easy to find historical parallels for the source of Itelmen ejectives, since very little is known of the origin of ejective - or other glottalized - consonants among the world's languages: in areas where they are common, such as the Caucasus, they appear to be deeply entrenched and their historical source in anything else is not transparent (J. Nichols, pers. comm.). The only historical route to such segments I am aware of is from clusters of oral stop plus glottal stop, but the latter (other than as automatic anlaut) is secondary in CK languages and not reconstructible for Proto-CK. Note, however, that glottalized (actually implosive) consonants in various south-east Asian languages may arise from clusters - also involving nasals - after loss of vowels or whole prefixes, etc.; this apparently occurred in proto-Kadai (of the Austro-Thai stock) in conjunction with the reduction of bisyllabic to monosyllabic stems under the influence of neighbouring Mon-Khmer languages, where glottalized consonants are common (Solnit 1992, 117). Ejectives in Zulu and related South African languages arose in part at least from combinations of nasal plus stop (one of the sources of the phenomenon in Itelmen). Ejectives are usually found in languages with phonemic inventories more complex than the Chukotkan ones, which bolsters the impression of a substratum influence in the case of Itelmen.

9. This form illustrates, by the way, the historical dropping of whole initial syllables in CK, the initial consonant showing up again in Chukotkan only when further prefixed. The erosion of the onset as well as the final syllables of words in CK (including the weakening of initial stops to fricatives) is no doubt connected to two related factors: the increase of prefixation in the family and the movement of word stress away from the first syllable.

10. What caused this latter development is still not clear, but it may be related to the origin of the dominant vowels of CK vowel harmony pairs, although such 'pharyngealized' words in Itelmen do not correspond exactly to the much larger set of dominant harmony words in Chukotkan. According to Jonathan Bobaljik

(pers. comm.) the phenomenon in Itelmen may be a sporadic development connected to the final stages of the disintegration of vowel harmony in the language. The effect was first noted by Volodin and Xalojmova (1989).

11. */t/ (or */ð/) may also go to /s/ before an /i/, as in **sis** 'needle', going with Chukotkan **titi** (and **seŋ-** 'fly' from CK ***ðiŋæ-** < ***tiŋæ-** and ultimately Proto-US ***teŋ(ă)-**).

12. Forms from the older sources such as Krašeninnikov (1755) and Radlinsky (1892-3) are cited as given there. The eastern (E) and southern (S) forms could be unrelated. There is also some uncertainty as to the initial stop in earlier western Itelmen (now dropped everywhere); the form from Jochelson (1898) cited in Worth (1969, 207) suggests an original uvular.

13. The **-(e)cX** in the first Itelmen form is a suffix 'small', and the /e/ in the stem of the second reflects the lexicalized dominant vowel form; all except the default western Itelmen forms reflect older, non-phonemic orthographic renditions.

14. With this set can be compared another equally central cultural etymology shared by both branches of CK, namely that of the name of the legendary creator Raven: PCK **k(yR)uðkyl** - Chukchi **ku(u)rkil, qu(u)rkyl,** Kerek **qujkyjnʲaqu,** Koryak **kujkinʲaxu** (Kamen' dialect **qujqynʲnʲaqu,** both with suffix **-nʲaqu** 'big'), Alutor **qutkynʲnʲaqu,** and Itelmen **kutx.**

15. The Alutor sound thus symbolized is according to Muravyova an 'emphatic' - i.e. pharyngealized - glottal stop, much as in Chukchi.

16. The Palan Alutor is **ʔərəʔər,** the Koryak **RəjaRəj,** a reduplicated stem. Further parallels are found in related forms meaning 'young man' in all Chukotkan languages - from PC **Rora(t)ceke.** To this may be compared Eastern Itelmen **krošcox** (for **qrašcak** ?) 'man' in Krašeninnikov and other early sources - also for the southern language. As with other older Itelmen material, however, we can never be quite sure what the exact form was.

17. The languages that survive are Kolyma and Tundra Yukagir; the latter has been strongly influenced by Tungusic, but has in turn retained some archaic features such as final /ŋ/. Another variety, Chuvan, was spoken further east, in the Anadyr valley, where its speakers have been absorbed by Koryak and (especially) Russian speakers. Luckily it was partially recorded - if very impressionistically - before extinction by the beginning of this century (as were fragments of two other northerly 'dialects', Omok and the variety spoken around the Yana river, to the northwest - see Tailleur 1962 and 1959b). It contains direct evidence of the nasal plus spirant clusters that have disappeared in the surviving forms of the language.

18. In her article she concluded, based on a handful of old forms, that Chuvan, alone of the recorded dialects, had retained */s/ as such, but now she is more inclined to see the difference between Chuvan and Tundra Yukagir as rather small and the old forms in question just orthographical misrepresentations. Tailleur (1959, 420)

was the first to note the Uralic */s/ = Yukagir Ø correspondence, but Nikolaeva rejects many of the concrete etymologies he proposed in support of this.

19. In this argument he may have made too much of the parallel with the Aleut anaphoric construction: in his later writings he revised his position as to the exact nature of the relationship of modern Aleut to Proto-EA, which he came to see as much closer to modern Eskimo.

20. On very shaky lexicostatistical grounds he speculated that 'Chukotan' and Eskimo split only some 5,000 years ago. For a critical comment on Swadesh's theory of genetic relationship see Menovščikov (1974), who sees the lexical communality that can be unearthed between Eskimo-Aleut and Chukotko-Kamchatkan as due to contact.

21. In the first of these articles I suggested also an Altaic link, possibly more recent than the Yukagir one - this may have been an overly hasty conclusion.

22. For instance with Eskimo as regards the typologically aberrant form of ergative morphology displayed by the Chukotkan languages (see section 3.3). It is generally agreed that there has been long-standing contact (if not a substratum relationship) between the two families on Chukotka. One must for this reason be careful not to attribute, uncritically, shared typological features such as ergativity to the hypothetical proto-language. It is more realistic to envisage alternating periods of separation and close contact since their hypothetical common source, with different contributions to the relationship we see today arising during successive contact episodes.

23. Ancestors of the Kets and other Yeniseians, today hunters of the taiga, were supposedly drawn into the Hun union some two thousand years ago and subsequently displaced into the Sayan region, where they remained until the expansion of the Mongolian empire pushed them still further north (cf. for example Ivanov et al. 1968, 7 and Janhunen 1996, 186). According to this view, they may thus represent a small Siberian population related to the now Turkic-speaking Kirghiz but peripheral to the spread zone 'highway' of the Eurasian steppes, that was for a while drawn into the fast traffic, later to be spun off again. However, all of this remains highly speculative, and the main language of the Huns of Mongolia was probably Turkic. (Another group that definitely took a spin on the fast lane - with more lasting success - were the Hungarians). See Okladnikov (1964, 68f.) for an account of the short-lived Chinese administrative presence in the area before the advent of the Huns, which may throw some light on this perhaps spurious notion of the extra-Siberian arrival of Yeniseian languages in the area. The linguistic links to Na-Dene (to be returned to later) suggests rather that they have been present in Siberia for a very long time indeed. Certain 'Americanoid' physical traits of the Yeniseian people have been remarked upon in the past (cf. Levin 1963, 43).

The Nivkh, on the other hand, have apparently been present as sedentary fishermen and coastal hunters in the lower Amur and adjacent regions since at least 2,500 BC, when their ancestors lived in semi-subterranean houses and there

were cultural links between the local neolithic and the Yang Shao culture of the Yellow River. Although there is no guarantee that these early people spoke anything directly ancestral to Nivkh, they represent a distinct anthropological 'type' like the modern Nivkh (Levin's 'Amur-Sakhalin' type), showing signs of mixture with the neighbouring Ainu (Levin & Potapov 1964, 103). The latter were present on the Japanese main island during probably all of the Jomon period, starting at least 8,000 years ago. Links between the Nivkh and American Indians have long been suspected but never substantiated (cf. Levin 1963, 279f.).

24. If so, the other branches of Uralo-Siberian can hardly be left out of the picture in discussing the idiosyncratic features of Tungusic languages vis-à-vis other Altaic, especially in the light of the known ethnic interpenetration of their speakers with an early 'Paleo-Siberian' population. A case in point is the Tungusic accusative suffix ***-ba** (from ***-m(V)**?), which is easily relatable to the Uralic accusative suffix ***-m**, but is not reflected in the other two Altaic branches (Sinor 1988, 715). Sinor further relates Tungusic plural **-l** to the Uralic collective of the same form (also a Tungusic and Uralic plural element in possessive suffixes **-n**) and Tungusic locative **-la** to Ugric ablative **-l** (also the 'external' local case suffixes with **-l-** of Finnish). He points out in this context that the personal possession/subject markers apparently shared by Altaic and Uralic - which has been made much of in a Nostratic context - are actually limited to certain but not all Altaic languages, thus 1s ***-m** is Proto-Uralic, Turkic and Tungusic, 2s ***-t** is Proto-Uralic and Tungusic only, and 3s ***-s** is Proto-Uralic and Turkic only (in Mongolian such inflections are recent). These all derive from corresponding pronominals, note, and there is no reason why areal convergence (whether between related or unrelated languages) should not also involve pronouns, given their centrality in actual face-to-face communication (English after all borrowed its 3rd person plural pronoun from Norse). The use of 3rd person possessed forms as functionally 'definite' NPs, as discussed in 5.1.2, is on the other hand an important feature linking Uralic to Tungusic alone amongst the Altaic languages. Sinor also mentions a number of near-identical Tungusic and Uralic tree names not found in other Altaic languages (Sinor 1988, 737). The reader will find various other morphological elements treated by Sinor that could be Ural-Altaic in origin in Chapters 4 and 5 of the present book.

25. Thus compare - with great caution - the Eskimo-Nostratic correlates suggested by Mudrak (1984); his comparisons are based mainly on a single Eskimo language (CSY) and in a number of instances he treats Chukchi loans in the latter as if belonging to Proto-Eskimo. The possible cognates shared by EA and other 'Nostratic' languages that have been suggested in the literature have generally turned out to be less than convincing in the light of direct comparison with Proto-EA, which is now possible. Thus the Eskimo stalwarts **alla** 'other' and **ingniq** 'fire', cited (as here in their Inuit guise) once again by Kerns (Bomhard & Kerns 1994, 154), can in fact not be related to the IE stems of similar shape since they derive respectively from **at(ə-** 'be similar' and - as already pointed out by Thalbitzer in 1952 - **əkə-** 'burn' (for the latter compare Yukagir **jeŋkilə** 'fire' rather). Similarly with morphology: the attempt of the same author to relate the 'weak q-stem'

phenomenon in Eskimo to the heteroclitic declension of IE founders on the fact that the former is actually a singulative affix and not a nominalizer at all (op. cit., 181). His attempt to link the 'odd' EA genitive/relative case marker **-m** to Nostratic **-n** via vocalization to a nasal vowel followed by later 'renasalization' as **-m** (despite the fact that EA languages have preserved the final /m/ v. /n/ distinction) typifies the ad hoc nature of most speculations of this nature.

26. The latter possibility looks feasible to me solely on typological grounds (including substratum interference effects) - I am not qualified to evaluate those lexical links that have been proposed. The hope of recontructing any common proto-language forms is dwindlingly small at this time depth, as far as I can judge.

27. Even if Janhunen is correct in insisting that any given language (apart from pidgins and creoles) has just one genetic ancestor, however obscured by later linguistic contact, it is perfectly conceivable that several successive contact episodes could cumulatively result in a situation where no such determinate thread could even theoretically be envisaged. Thus, for instance, a language X might first adopt most of the vocabulary of one or more neighbouring languages while retaining its grammar, then subsequently (as X_2, if you like) come into close contact with a 'superstrate' language Y, whose grammar it largely adopts while maintaining much of its 'original' vocabulary - and so on through several such episodes if the time depth is great enough. Is its ancestor now X or Y? Though a single criterion (say the retention of grammar) might be applied across one such episode, this becomes increasingly arbitrary as contact/substratum episodes accumulate, especially if pidginisation is not just a process typical of recent colonial times (Janhunen himself suggests that Mandarin Chinese might be in origin a kind of pidgin arising from contact between speakers of Sinetic and Altaic languages in the north of China - cf. Janhunen 1996, 167).

    The example of Japanese, as described by Janhunen (op. cit., 199ff), illustrates my point here in fact: even if one sets aside the possibility mentioned by Janhunen that some very early ancestor of Japanese might have been a monosyllabic, Sinetic type of tone language, it is clear that it has absorbed at different periods a great deal of vocabulary from Chinese and other neighbouring languages from the Korean Peninsula, but also displays some important lexical links with southeast Asia (an Austronesian substratum on the southern Japanese islands?). It has also undergone massive grammatical influence from some Altaic type of agglutinative SOV language (either from or parallel with Silla Korean). So which thread is one to follow back in time to find the ultimate ancestor of Japanese? The vocabulary (but which is the earliest layer, 'Austronesian' or 'Altaic'?); the phonology (its pitch accent system and traces of vowel harmony are parallel to those of Korean but the Austronesian element also appear to be strong); or the grammar (mostly Altaic/Tungusic?). It depends on one's perspective: whether over millenia or just a few centuries. Certainly linguistic origins tend to be more easily traceable - at least at not too ancient a time depth - than political and/or ethnic ones, but Janhunen's statement (op. cit., 214) that somewhwere behind the multiple sources of Japanese there is a single 'stable parameter of genetic identity' sounds to me like an article of faith.

28. Also Greenberg (1991, 132f.) cites this purported Eskimo 1s ***-m**. In the same context he misanalyses the Chukchi 1s marker as **-iɣəm**, which is the predicative form containing **-i-** 'be', in order to relate it to Latin **ego**, etc.

As regards the Nivkh 1p inclusive pronoun **mir/mer**, according to Panfilov (1962, 238f.) this (like 1st dual **megi/meŋ**) is based on **mi/me** 'two' and thus can have nothing to do with 'Nostratic' m-initial 1st person forms (including CK **muri** 'we'). Attempts to link Nivkh to 'Nostratic' (and hence also US) languages, such as in Bomhard & Kerns (1994), strike me as particularly weak.

3 A typological overview of the region

What then is the typological backdrop against which the detailed historical investigation of linguistic relations across the Beringian Gateway needs to be set in relief? I have chosen 44 features as being particularly relevant to addressing this question, as displayed in alphabetical order on maps 9 - 53. They (or their absence) are rare enough to have some potential diagnostic value, but not so idiosyncratic as to reflect only very local developments. Although some are more relevant than others, all the features I shall address have some bearing on the situation today, whether as large-scale areal features, as historical markers of deep genetic relationship, or as traces of more local diffusions or substratum effects. Numerous features of the languages of the region that happen to coincide either by forming part of more global clines or by being statistically very common both inside and outside the region (and thus probably the result of coincidence) do not appear. I shall make a few comments on each feature in turn, without explicitly pointing out all possible areal implications - this overview represents the initial, inductive stage of the typological investigation[1].

Recall that my method of using typological data to extend the historical picture involves determining a bundle of typological features reconstructible for the proto-languages of all the known families involved. Where one of these features is lacking in any of the contemporary languages that lack should also find some plausible explanation. The individual diagnostic features must not fall out from some more general feature, and together they should present a unique profile (not one common among the world's languages) that supports the likelihood of some deep historical relation between the languages displaying them. In 3.2 I shall summarize those features which can be said to constitute a Uralo-Siberian profile, distinct both from large-scale areal clines bridging the Asian and the American side of the Gateway and from other clusters of features probably brought by earlier linguistic waves into the New World. It is this profile that causes the Uralo-Siberian group of languages to stand out against the general typological background. In 3.3 I shall return to the question of how we can determine which specific features might be historical markers on their own. The subsequent deductive stage of the application of typology will be spread throughout the following chapters, whenever I appeal to this profile as the starting point for a particular morphological or phonological development.

I shall not enter in this chapter into the question of more geographically limited linguistic areas in the region - the only egregious one is the well known case of the Northwest coast of Ameica[2]. It should be borne in mind here that features clustering in such areas that cut across genetic boundaries often reflect diffusion and/or substratum relations. I will return to this matter in Chapter 8.

3.1. From the Urals to the Rockies

The principal languages or language families covered are shown on Map 8 (refer to the list of abbreviations at the front of the book). The vagueness of especially the terms 'OP' and 'CP' (respectively Penutian in Oregon and California), 'CA' (Coastal Athabaskan of Oregon and California), and Ho (Hokan) should be pointed out[3]. Californian Algic (Ritwan) and Yukian languages, Chimakuan in Washington, and

Salishan in Oregon (as opposed to Washington and British Columbia) I have omitted entirely since they cover too small an area to be represented. The language boundaries are fairly schematic but correspond more or less to their distribution today. Observe that I have added Russian but not English, out of typological interest (Russian representing an older, inflectional stage of Indo-European that has been in contact with Uralo-Siberian languages much longer than English has with native American languages). With the inclusion of isolating Chinese, a full range of morphological types is represented (the Uralo-Siberian languages show varying degrees of agglutinative morphology, as typified in purer form by Altaic ones). Inevitably, the data condensed on the maps is in many instances over-simplified, lacking in precise definition and important details of usage and manifestation of the features concerned: as always in typology one is up against the problem of deciding what exactly can be compared with what - I beg forbearance from specialists, who will no doubt see less than perfect fits for some of the features with 'their' languages.

Map (9): *Adjectives as a distinct part of speech.* This is one of the maps that needs to be interpreted primarily in terms of the absence rather than presence of a feature. Apart from Ket, CK, some Penutian and of course Russian (which I shall generally pass over in my comments), it is the absence of the inflectionally distinct category 'adjective' that characterizes the whole region. Generally Russian and English adjectives correspond here to stative verbs in predicative usage and to participles based on them in attributive usage (this is true also of Athabaskan, where there is nevertheless a small category of distinct attributive adjectives). Also in Tungusic adjectives are only really distinguished from nouns/ participles by differing derivational and agreement potential, though there are a few non-derived adjectives. The situation in CK requires special comment: in all Chukotkan there is a distinct circumfix that forms adjectives[4], and in Koryak and Alutor such forms can not be used attributively. In all the CK languages - including Itelmen, which also has a distinct adjective marker, originally used only predicatively according to Volodin - adjectives are limited as to inflectional paradigms, although their stems act much like stative verbs (forming for instance attributive participial forms). There is also a corresponding adverbial formant in CK. In Ket adjectives are noun-like, but take personal possessive inflections when used predicatively[5].

Map (10): *Antipassive and indefinite object affixes.* Being ergative, it is not surprising that Eskimo, Tsimshian and Chukotkan have antipassive markers (morphological since they all possess complex morphologies), also Aleut, which retains traces of its earlier ergativity. What is perhaps more interesting is that non-ergative Yukagir, Itelmen, Haida and Na-Dene have indefinite/dummy object affixes (proclitic in Haida) of essentially the same function, namely reducing the specificity of the object of transitive verbs. In ND (and Haida) these overlap with 'areal' prefixes. Algonquian has similar affixes, whereas in Salishan the middle voice covers antipassive-like function.

Map (11): *Auxiliary verbs.* Although the presence/absence of auxiliaries is not particularly significant (they tend to come and go rather rapidly), the differing functions they perform in sub-areas may be more so. Auxiliary verbs expressing mood/tense/aspect distinctions - and usually marked for person and number rather

than the main verb itself - are typical of the languages on the Asian side (with the partial exception of Yukagir, some of whose suffixes may in fact be interpretable as auxiliaries, or at least recently have coalesced from them). The functions served by auxiliary verbs in CK languages are, however, somewhat different and apparently isolated: they are essentially verbalizers (transitive or intransitive) used with special (case-marked) nominalizations, including stative stems of emotional or mental state. The nearest analogue may be in some of the Haida 'auxiliaries' or rather 'directive causative' morphemes[6]. These analytic constructions have an immediate, temporally limited sense, as opposed to corresponding plain verbal expressions of more permanent/general relationships or states. The interesting thing here is that many of the verbalizing affixes of Eskimo-Aleut (including that for transitivizing emotional stative verbs, **-kə-**) may once have been auxiliaries of this type, although the grammaticalization process must have been very slow since there is no trace left of any of the independent stems - Eskimo may simply have moved further down the same path. The 'be', 'do' type auxiliaries of Aleut - which express modality and tense - may be a newer phenomenon, consequent to the general collapse and reformulation of the morphological system, or possibly as the result of contact or a substratum relationship with coastal Na-Dene speakers - note the presence of 'be', 'get' 'become' auxiliaries of the mood/tense/aspect type also in Tlingit[7].

Japanese and Korean 'do' type auxiliaries are most commonly used with Chinese loans (but note that both J and K have historically absorbed auxiliaries into their verbal mood forms). Auxiliary verbs have played an important historical role in Ket but are now largely fused into complex verb forms.

Map (12): *Consonant clusters and monosyllabic stems.* These are two distinct parameters, but they are closely associated in the region under investigation. Although there are some languages that display primary (lexical) geminates - a feature of some Eskimo, CK and Uralic languages which may go back to the proto-language (certainly to Proto-EA) - syllable structure is rather simple in the central and eastern part of the region, with (C)V(C)CV(C) being the most common canonical stem shape. The exceptions, namely Itelmen, and to a somewhat lesser degree Alutor and Kerek and Aleut (also Eyak), are therefore the more egregious. To find clusters as complex as in Itelmen one must go as far afield as the Salishan languages of the northwest American coast - or to Russian and Nivkh. Also certain Samoyedic languages have developed complex clusters to some degree (though not word-initially) and Ob-Ugric (to a lesser degree also Samoyedic) has acquired many monosyllabic verb stems via syncope. There is a possible causal link between the two features on this map in so far as historical syncope - not itself an uncommon process - may reduce bisyllabic stems to monosyllabic ones, producing in the process new clusters (note that monosyllabic stems predominate in Itelmen and that Aleut has more of them than Eskimo does). The wide-spread metathesis that has further affected resulting clusters in Itelmen and to some degree Aleut would suggest a secondary adjustment to syncope. Northern Tungusic and Yakut have developed numerous geminates, like most US languages (lost again in Yupik and Aleut).

Map (13): *Copular constructions.* The specific feature to be focused on here is the distribution of morphological 'be'-type affixes, which typify the languages immediately straddling the Gateway, Eskimo and Chukotkan, also Yukagir. Itelmen and Aleut are

again odd ones out, following Na-Dene in having an independent 'be' verb (Na-Dene actually has several - Haida also has a stative suffix **-ga-** acting as a morphological copula). Chukotkan and Yukagir also have independent 'be' verbs, for instance in locative and existential senses, the morphological copula being somewhat restricted/lexicalized in use in Chukotkan but completely productive in an equational/class-assigning function in Yukagir. Eskimo also has a semi-independent locative 'be' verb (**it-/et-**), which in some dialects is only found as a bound morpheme. Interestingly, Aleut has the cognate of the morphological identifying/class-assigning copula **-(ŋ)u-** of Eskimo as an independent verb (**a-/u-**), but also some traces of its morphological use (e.g. in two of its passive morphemes). This suggests that the status of this morpheme as independent stem or affix was fluid for a long time (as is the situation with **it-** today within Inuit). In all languages with morphological copulas an inflected verb represents the minimal verb clause, note - these are all languages of the 'polysynthetic' type, where also noun phrases may be treated as unitary nominal stems for purposes of derivation (see Map 23 on Incorporation).

In Samoyedic, Nanai, and Turkic and Mongolian languages (as also in many American Indian languages south of Na-Dene) is found the phenomenon of 'conversion' (directly inflecting a noun as a verb, as in Nenets **xasawa-dm** 'I am a human being', with 1s inflection **-dm** directly added to the nominal stem). This could in some cases reflect the historical erosion and loss of a morphological copula (a process underway in Chukotkan too). Ket has a zero copular construction, but with no verb-like affixes on the predicative nominal; Nivkh has such a construction, but also has a copular verb and a copular focus enclitic shared by verbal and nominal forms (compare the Yukagir 'nominal predicate' construction in 5.1).

Map (14): *Diphthongs and long vowels.* The presence of diphthongs is one of the less significant features, as they are known to have developed secondarily in Eskimo since Proto-Eskimo through loss of intervocalic fricatives, a common process, and elsewhere in the region as a secondary development from lengthened vowels and/or vowel plus semi-vowel combinations. It is nevertheless of significance in the immediate Bering Strait area: here Siberian Yupik - apart from Naukanski, which has just begun down this path - has lost its diphthongs apparently through contact with Chukchi, via a similar kind of regressive assimilation as that found in the varieties of Chukchi (most of them) that drop intervocalic fricatives. In Greenlandic Eskimo, by contrast, diphthongs have also largely been lost, but there by more natural progressive assimilation. Although long vowels are not reconstructible for any branch of US (unlike all Altaic families, with the possible exception of Mongolian), they have developed either as in Chukchi or by lengthening of full vowels in certain conditions (as in Alutor and Yukagir) or by development from a full v. reduced vowel contrast[8]. The status of long vowels in Ket is debated, but is regarded as a prosodic matter (related to tone) by Starostin (1982, 194f).

Map (15): *Distributive affixes and suppletive plural forms of verbs.* Both of these ways of marking multiple actors on verbs are common in northwest America head-marking languages, where plural marking on nominals is limited. On the Asian side (apart from largely head-marking Ainu and Ket) distributive affixes indicating multiple subjects of intransitive and multiple objects of transitive verbs are found only in Chukotkan and Eskimo (certain such markers may in fact be cognate - see 4.4).

Similar meanings are expressed by reduplication in W, Ts and Sa. In EA the affixes concerned overlap with purely aspectual function (e.g. as iteratives/ frequentatives). Suppletive (or rather matched) singular/plural verbs are limited to ND, Ket, Ainu, Salishan and Penutian.

Map (16): *Ejectives and multiple stop series.* This is one of the most significant maps in the series - it both shows the complete isolation of the phenomenon of ejective consonants in Itelmen until one reaches Na-Dene on the American side, in which ejectives are reconstructed also for the proto-language, and the association of all and only Uralo-Siberian languages (apart from Itelmen) with a single (voiceless) original stop series, as far south in the region as Ainu or Algonquian. In northern Samoyedic and Yukagir the development of a voiced series is secondary. The range of glottalized/ejective sounds is extended to its maximum in the northwest coast languages south of Na-Dene, where also typologically infrequent glottalized continuents are found, so ejective stops (their typological prerequisite) must be very ancient here indeed[9]. The case of 'Algic' Yurok developing ejectives in the Californian area may be parallel to that of Itelmen on Kamchatka, although the trait has long since disappeared as an areal marker - if ever it was - in the latter region. The 'constricted' consonants of Korean are also close to ejectives phonetically. The complex initial consonant alternations of Nivkh (in part syntactically determined), producing three stop and two fricative series, are unique to the region.

Map (17): *Ergative morphology.* Special ergative marking of transitive verb subjects (as opposed to intransitive ones and object NPs) is potentially a most important feature, since it links Chukotkan and Eskimo across Bering Strait to the exclusion of all other adjacent languages as far as Tsimshian. However, this is also a good example of the caution needed in treating a feature - however deeply rooted it may tend to be on a global scale in those languages displaying it - as a historical marker in a given situation. As I have argued in detail (Fortescue 1997a), this would appear rather to be a feature adopted from Eskimo by Chukotkan but not Itelmen. Ergativity has virtually disappeared from Aleut, its morphological marking having become reinterpreted in terms of a new anaphoric reference system (see further on both points under 3.2). The ergative sub-systems of Tlingit and Haida are secondary (and in the latter largely covert). In Salishan ergativity is limited to 3rd person subject marking on verbs (whereas in Oregon Penutian there are fully-fledged - though 'split' - ergative systems with case distinctions). For the ergatively based focal system of Yukagir refer back to section 1.3.

The 'hierarchical dominance' of Algonquian (whereby a strict agency hierarchy alone determines which external NP is subject or object) is close in nature to the verb-internally nominative-accusative orientation of Athabaskan, where an animacy 'chain of being' hierarchy determines what NP may be regarded as transitive subject. Ergativity in Sahaptian OP (including Nez Perce) is not of the classical type (there is a three-way case marking distinction between S, O and ergative A). Stative/active orientation links Tlingit and Haida and is reconstructible for Yeniseian.

Map (18): *Front rounded vowels and schwa.* Front rounded vowels (and sometimes also back unrounded ones) are a common feature of Uralic languages (though lost in Nenets and Enets) and in general typify the Asian rather than the American side of

the Gateway (especially where palatal harmony thrives). Schwa (i.e. an indeterminate central vowel) is, on the other hand, found in all the languages immediately to either side of the Gateway (though it has been lost again in Aleut and in most Inuit Eskimo apart from the Diomede Islands dialect). Schwa, note, is a very common vowel (and not just epenthetic) in CK and Yupik languages, also in ND (though lost again in many languages) and in Tungusic. It can even bear main word stress in some of them, including Siberian Yupik, Diomede Inupiaq and Chukchi (in such cases it is debatable to what degree this is canonical 'schwa'). In Mongolian, what used to be front rounded vowels - and indeed all non-initial vowels - tend now to be neutralized as schwa when unstressed; in so far as distinctions in the reduced vowels are maintained, this is a similar situation to that in Itelmen, where older reduced vowels appear to be merging as schwa in the northern, Sedanka dialect at least. In Yukagir, as Nikolaeva has recently demonstrated, schwa is limited to peripheral positions in the word (in affixes or as the final vowel of certain stems, including ones of more than two syllables). According to Janhunen (1982, 27), schwa may have existed in the second syllable of stems in PU (it was certainly present in Proto-Samoyedic).

Map (19): *Genitive and accusative case marking.* Accusative marking is limited to non-ergative languages of the region (except for Sahaptian OP, which has an analogous 'objective' case), but both case markings are more typical of the Asian than the American side, this reflecting the dominant dependent-marking nature of the former as opposed to the predominantly head-marking nature of the latter. In Tsimshian (and probably Haida) the 'genitive' marker is a clitic (which may also be true of the 'particles' of Chinese, Japanese and Korean). The 'instrumental' often has genitive function in Kwakiutl (compare the object marking on Map 49). All the Uralo-Siberian languages except some Uralic (notably Ugric) display a genitive suffix, though it is limited in usage in Yukagir to 'generic' possession - otherwise there is simple juxtaposition of possessor and possessum as in adjacent Tungusic and Yakut, which may well have influenced it. Ket has a possessive 'particle' of similar distribution that varies according to the gender of the possessor. In Uralic and Turkic languages the accusative is generally restricted to definite objects (but recall the Nganasan 'indefinite object' construction in 1.3), and in Ob-Ugric it is unmarked, as also in Itelmen and in Yukagir except when a 3rd person subject is present. An accusative marker existed in Proto-Uralic, according to Janhunen (1982, 30) also restricted to definite objects. Nivkh may use its absolutive case for indirect objects of ditransitive verbs as well as for ordinary direct objects.

Map (20): *'Have' constructions.* There is a rough dichotomy between the 'be' verb plus locative or possessive nominal construction on the Asian side (minus Eskimo, which goes with the other side) and various morphological or independent verb 'have' constructions on the American side amongst the languages we are most concerned with. An exception is Na-Dene, which has independent 'have' verbs of an existential type, but also employs transitivized classificatory or other 'neuter theme' verbs (compare its lack of morphological copula). Yukagir has several constructions here, including both a morphological 'have' affix of the EA type and a 'have' verb based on a common Uralo-Siberian 'be' verb. Chukotkan and Yakut too have both kinds of constructions - the 'be' plus locative ones may be due to Russian. In some Sa it is a matter of a stative aspectual prefix on a nominal head rather than a specific 'have'

affix.

Map (21): *Head/dependent marking.* As quantified in Nichols (1990, 481), there is a distinct gradient between the essentially dependent-marking languages of northern Eurasia (with case marking on noun arguments of verbs and possessor markers on possessors rather than possessed heads) and the head-marking languages of most North America (excepting much of California). This feature she regards as particularly robust, often influencing other aspects of a language's grammar. 'Double marking' EA takes an intermediate position here, cross-referencing case-marked noun arguments on the verb and marking possession relationships both on possessor and possessum, as befits its geographical setting[10]. Only Nivkh, Ket and Ainu on the Asian side are of the predominantly head-marking type (modified in Ket by the recent development of a case-like system), although Nivkh has rather little morphology. Possibly the admixture of constructions of a head-marking type in Tungusic languages (especially strong in Nanai) may be a local areal feature, due ultimately to an earlier, more clearly head-marking ancestor of Nivkh (and other Amuric languages). The same tendency may have spread from the ancestor of Ket to Yakut. Since Algonquian and (especially northern) Uto-Aztecan, for example, are also strongly head-marking language families, this feature may be associated with an earlier stratum on the American side than either the Uralo-Siberian or the preceding Na-Dene one. The increase in dependent-marking in coastal Salishan could reflect Penutian contact or substratum influence.

Map (22): *Inclusive/exclusive 1st person plural.* I include this map to illustrate a feature which is quite alien to Uralo-Siberian languages, but which may reflect an earlier phase in the colonialization of the Pacific Rim. If so, this would enhance the impression that the Altaic languages (which - apart from Turkic - share this feature) are less closely related to Uralic than has been assumed in the past (and more recently by the Nostraticists).

Map (23): *Incorporation.* Canonical noun incorporation, as well as analogous polysynthetic constructions involving suffixed bound forms rather than independent verb heads (as in EA) or 'lexical affixes' (of a locational-directional or instrumental nature, as typifying Salishan and Uto-Aztecan respectively) are all typical of North (and Meso-)America. Apart from 'suffixing incorporation' of the EA sort, widespread in Siberia (though much less recursive than in EA), the only representation of incorporation on the Asian side is in the peripheral Chukotkan languages plus Ket, Ainu and Nivkh. Yukagir, unexpectedly, incorporates adjuncts only (adjectival stative stems are often incorporated into head nouns), but this is also found in Chukotkan, in which multiple incorporation has developed to its full potential, and so it may have developed under Chukotkan influence[11]. In Itelmen incorporation is quite unknown, but as has been pointed out by others, this may be because it was lost at an early stage under Russian influence - the phenomenon is also receding in modern Chukotkan. Incorporation is something one would expect to be associated with head marking, so it is remarkable that it has developed to such a high degree in Chukotkan with its mixed head/dependent (but mainly dependent) marking. There may be a link to the development of circumfixes there (see 4.4). The prevalence of suffixing incorporation in northern Tungusic and Yakut may reflect the increasing morphological complexity

of the verb towards the Gateway region (Chukotkan too has a few analogous circumfixes), but it is also typical of Samoyedic.

Note that all Na-Dene languages are characterized by a wide array of prefixed 'derivational strings' of a locational-directional, aspectual or adverbial nature, and these could well be viewed as lexical affixes too[12]. It is uncertain whether noun incorporation in Athabaskan - limited to NA - is original or due to outside influence (it is present in Tsimshian, Algonquian and marginally also perhaps Tlingit). Given the rather peripheral position taken by incoporated nouns in the NA verb complex (amongst 'disjunctive' prefixes far from the stem), it may be a newer phenomenon than the accretion of other derivational/thematic prefixes including locational/ directional ones (however, incorporated postpositions, situated still more peripherally, must be even newer and yet they are found in CA and Navajo too).

Map (24): *Indicatives based on participles.* This is one of the features that suggest a particularly close connection between Uralo-Siberian and Altaic languages: all and only these languages of northern Eurasia commonly use participial (originally nominal) forms in finite indicative function with the addition of personal subject markers for 1st and 2nd person. In some of the languages (notably some Uralic and CK) there also exist indicative paradigms not immediately relatable to participles, but these too often reflect old participles retained only in indicative function today. In Uralic, however, there is also some evidence of an earlier tenseless aorist in which the person/number markers were attached directly to the verbal stem (this may have a parallel in the so-called 'general' paradigm of Aleut). In Turkic and Mongolian the feature is even more marked than in Uralo-Siberian languages, with various other, non-participial nominalizations being used in finite indicative function. Yupik - like all Altaic and Uralic languages - has distinct past/perfect and present participles[13]; Aleut has a distinct remote tense participle and some Inuit dialects have a recent past participle. In Nivkh a fixed form of the verb (perhaps a generalized nominalization) without further person distinctions is usual in indicative function.

Map (25): *Initial and intervocalic /ŋ/.* This sound is widespread on the Asian side, but within our overall region is only present on the American side in EA and some adjacent Athabaskan, also Haida (it is, however, reconstructed for Proto-AE by Krauss and Leer 1981). It is notable in initial position in Aleut and CK (where it results from loss of an initial vowel or whole syllable) and in northern Samoyedic, where it is a secondary, automatic anlaut feature[14]. There may be a historical link between this latter, unusual feature and the apparently epenthetic /ŋ/ preceding affix -(ŋ)u- 'be' in EA (and -(ŋ)o- in Yukagir). There are a few other affixes with such an epenthetic segment in Eskimo.

Map (26): *Initial /p/.* The absence of /p/ in Aleut and Na-Dene (it is marginal in Haida) is a potentially important piece of evidence for an early contact/substratum relationship here, but note that on its own the change of /p/ to /h/ or zero (via /f/, as in Manchu), is not unusual on the Asian side - in initial position at least - especially within Altaic languages (but not CK, Yukagir or most Uralic). The loss of initial /p/ is probably relatively recent in Mongolian, Tungusic and Nganasan. The change of medial /p/ to voiceless /hm/ in Aleut is more so (see further under 8.2). Initial /p/ is marginal in Ket but reconstructible for Proto-Yeniseian. It is limited in coastal

Salishan, which could be interpreted as reflecting its absence in Proto-Salishan if interior Salishan /p/ is from a labio-velar, as has been suggested by Thompson (1979, 716).

Map (27): *Initial and intervocalic /r/.* An r-like sound is found throughout most of the region on the Asian side of the Gateway plus Eskimo, though it has been lost (usually by merger) in Koryak and some Eskimo and Uralic (and is often replaced by /tˢ/ in female speech in Chukchi). An /r/ has developed from */d/ in some NA (initially only in Hare), also affricates involving an r-like component have arisen (in e.g. Ingalik and Kutchin), but the distribution is different from in neighbouring Eskimo. The phoneme is not found again on the American sound until as far south as California. Within EA such sounds derive from */ð/, which has been preserved as such in Aleut (apart from Attuan). The sound is common in Chukchi even in initial position (resulting from merger of */ð/ and */r/ plus loss of initial syllables) and has been preserved in most contexts in - alone of the non-Inuit languages - moribund Sirenikski (much influenced by Chukchi).

Map (28): *Initial /s/ and /c/.* This is another map that needs to be interpreted in a 'negative' mode: it is the absence - or restricted distribution - of initial /s/ or /c/ that is the principal point here, linking as it does a number of Uralo-Siberian languages. The Uralic languages have preserved a number of distinctions in this area which may have been merged in various ways further east. Where initial /s/ (or /š/) is present at all it either represents an earlier palatal /s'/ (as in Yukagir) or an earlier /c/ (as in Inuit and eastern Chukchi) or the devoicing of initial /j/ (as in Yakut and some Alaskan Yupik). The fate of initial Uralo-Siberian */s/ is one of the phonological features creating most diversity among the different branches today. Note that the change from */s/ to /l/ (via /ð/?) has parallels in Ostyak and various NA languages. One interesting local development in this area is the exploitation of the difference between /š/ and /c/ in respectively female and male speech - this was the situation in Old Yukagir, as described by Jochelson (1898, 154). Yakut /s/ from */c/ (and the parallel development in Inuit and Siberian Eskimo) is probably unrelated - a similar change has occurred in Sayan Turkic (and further west), the area from which Yakut may ultimately have originated.

Map (29): *Initial sonorants.* Unlike /r/ and /ŋ/, /l/ and /j/ and /w/ are reconstructible in initial position for Proto-Uralic (and also Proto-US); where this is no longer the case they may have dropped or changed, as in EA. Where they do appear in initial position in Yupik languages and Aleut today this is mainly through elision of an initial schwa (in Aleut also other vowels or whole syllables) or loans. Yupik thus stands intermediate between Chukotkan languages with a wide variety of initial sonorants and Inuit with few if any; in fact their presence can be viewed as a Gateway trait, strongest on the Siberian side within Yupik and on Seward Peninsula within Inuit (note that the southern side of Seward Peninsula was also Yupik-speaking until fairly recently).

Map (30): *Morphological causatives and applicatives.* Morphological causatives are widespread throughout the region, but on top of this morphological applicatives (which

draw an oblique - e.g. benefactive or instrumental - argument into the verbal agreement system) are widespread on the American side. Chukotkan is intermediate (as the complexity of its morphology in general is intermediate) between the two sides, with applicative constructions of the Eskimo type expressed by zero (i.e. conversion of ordinary transitive verbs)[15]. Itelmen has a distinct 'indirect object' verbal paradigm, i.e. a kind of morphological applicative with indirect objects treated as direct objects. In Athabaskan the relevant construction is the incorporation of the heads (and pronominal dependents) of post-positional phrases (whereas Haida has a limited zero applicative construction in conjunction with a postposition on an external pronoun - cf. Enrico 1984, 230).

Map (31): *Morphological evidentials and attitudinal affixes.* Morphological evidentials are a feature which brings EA closer to Yukagir and Samoyedic than to CK, its evidential (as well as other 'sentential') affixes corresponding to independent particles/ adverbials in the latter - as also in Na-Dene (though CA Hupa has enclitic evidentials). I have not distinguished sharply between evidentials proper (as in Ostyak, for example) and affixes of 'degree of certainty' (as in Yukagir, for example) on this map. Ainu has evidential constructions with nominalizations plus copula/particle.

By 'attitudinal' affix I mean an affix that may appear on verbs (as well as nouns) to give an affective nuance of endearment or disdain, etc., towards the subject or object of a sentence. An affective diminutive meaning is produced in verbs in Salishan by reduplication and glottalization rather than affixation (as also in some W and OP). Also Tungusic languages have some augmentative (and to a limited degree other) affixes that may belong here. 'Affective consonant alternation' will be discussed in 8.2.

Map (32): *Morphological and auxiliary verb negation.* Morphological negation developed within certain Uralo-Siberian languages out of fusion with a negative auxiliary verb of the type common to Uralic and Tungusic languages (the morphemes concerned in EA, CK and Yukagir would all appear in fact to be cognate with the Uralic morpheme). A parallel development appears to have occurred in Turkic languages. In Na-Dene (and possibly Itelmen) it developed rather from fusion of the verb with a clitic particle (enclitic in ND, proclitic in Itelmen). Besides suffixed negation of the Eskimo kind Aleut also has an enclitic negative of the ND kind (on participial verb forms). In some ND (and Haida) a verbal suffix combines with a preposed negative particle. CK languages have a variety of ways of expressing negation with particles besides the morphological (circumfixed) one represented here, and Ni has at least one morphological negative construction, as does Kwakiutl. According to Thompson (1979, 744) the Salishan negative is, depending on language, either an auxiliary or a full verb followed by a subordinate form of the main verb (but it may also in others be an uninflected particle[16]).

Map (33): *Morphological passive and/or inverse.* Morphological passives are widespread throughout the region, except for Samoyedic (which has developed reflexive paradigms instead), ergative Tsimshian and Koryak (which shares passive participles with Chukchi, but not their full clausal elaboration). On top of - or instead of - this, many North American Indian languages have an 'inverse', which marks on the verb that the patient is more topical in some sense than the agent although the latter is not surpressed as in the canonical passive construction. The borderline is not clear-

cut, however, especially in languages which do not actually distinguish a passive form of the verb stem, only the inflection type it takes; to appear as such on the present map an inverse construction must be morphologically marked on the verb by more than inflection. The construction is commonly closely tied to 'obviation' based on animacy or agent/person hierarchies (as on Map 46)[17]. Athabaskan uses the same pronominal distinction in its 'inverse' construction (object markers within the verbal complex) and in its obviation construction (possessor markers on nominals). It is significant that there are traces of a hierarchically organized morphological inverse in CK languages too: here the phenomenon arose out of an earlier indefinite subject passive (as did the inverse-like construction in Bella Coola Salishan and probably other Sa and Al languages) and has been integrated into active verbal paradigms in those cases where the person hierarchy would be broken (see 3.2). Some Hokan has apparently acquired an inverse construction from adjacent Ritwan (Algic) languages.

Observe that Haida and Tlingit share with Itelmen an indefinite/ impersonal subject passive equivalent (by prefixation or, in Haida, proclisis), which is parallel to the source of the Chukotkan inverse forms (and all Athabaskan has an indefinite subject prefix). Such passives display a number of features more characteristic of inverses. Also the 'D-effect' passive of Athabaskan-Eyak reflects an old prefix (this is also involved in another Tlingit - 'anticausative' - equivalent to the passive). Ket has a zero-subject passive equivalent.

Coastal Salishan, like some Wakashan, disallows certain active combinations of subject and object according to a person hierarchy (in the manner of earlier CK) but it is debatable whether this counts as an inverse, sensu stricto, as opposed to an obligatory passive construction (Dale Kinkade, pers. comm.). See Anderson 1978, 62ff for the 'chain-of-being' type hierarchy involved in southern Wakashan, as in Athabaskan. In interior Salishan (e.g. Thompson) the choice of active versus 'passive' is principally a matter of focal topic tracking in narrative (the latter inflection type is chosen when the topic is object)[18].

Map (34): *Non-finite subordinate clauses.* Non-finite nominalizations functioning as subordinate clauses are typical on the Asian side, except for CK, which - surprisingly - has subordinating particles used with ordinary finite verb forms in the manner of Na-Dene (and Russian), though both of these families make some use of participial forms in, for example, relative clauses. Also Ket and Tibetan have subordinating particles. The special subordinate moods of EA - as in some Uralic and Tungusic languages - may have non-finite origins (as regards the so-called participial moods this is clearly the case, and is probably also so with the 'contemporative/ subordinative'). The distinction between finite verb forms and non-finite forms with personal suffixes added is often obscured by ongoing paradigm-formation in Uralic and Altaic languages, as also in Wakashan, where subordinate mood paradigms are apparently forming from person-marked particles or enclitics/suffixes of a nominalizing type (the process may have gone furthest in Nootka, which also has at least one subordinating particle). Salishan has both (possessed) nominalizations and subordinative/conjunctive clitic constructions. For the internally-headed relative clause constructions found in Na-Dene, and Aleut (also Haida and some Hokan) see 8.2.3.

Map (35): *Noun classes and classificatory verbs.* These categories stand out as lacking in all Uralo-Siberian languages, as opposed to many languages on the

American side which do display them - also, on the Asian side, as regards numeral classifiers, Nivkh, Ainu and Chinese (Japanese and Korean have at least in part probably borrowed this trait from the latter). Such systems (also found in some Algonquian and related Californian Algic) Nichols relates to the preceding ('Stratum 3') level of the colonialization of the Pacific Rim. Something similar is found in Tungusic and Mongolian too ('collective' noun class suffixes).

Note that the gender system of Ket (marked by verb agreement rather than on the noun) finds a parallel in the covert gender system of Athabaskan. The animate/non-animate distinction, crucial in Algonquian, also has importance in Na-Dene and Ket (e.g. in the choice of pronominal prefixes within the verbal complex) - compare also the Chukotkan animate individual class of nouns mentioned in 1.3. The distinction is overt in Tlingit, Haida and Eyak pronominals. Athabaskan has parallel numeral forms for humans on the one hand and things on the other (as also in interior Salishan). Gender in Chinook was apparently borrowed from Salishan. Algonquian has some classificatory 'medial' affixes, referring to the subject or object of the verb.

Map (36): *Noun phrase order.* The most salient deviation of EA languages from the 'harmonic' cluster of features usually associated with SOV languages is the strict positioning of all modifiers (apart from possessor nominals) after rather than before the noun head - all other Uralo-Siberian languages toe the line on this parameter. Na-Dene displays the same deviant trait, but here the very fact of having predominant SOV word order is in conflict with the overwhelmingly prefixing nature of those languages[19]. As regards EA, note that nominal modifiers are mainly participial forms of verbs, i.e. minimal relative clauses (in most languages in the region they precede heads like simple adjectival modifiers despite a universal tendency for such clauses to follow their heads). In Aleut demonstratives and numerals come in the expected position (like demonstratives in ND and Haida and unlike in Eskimo). Within CK there is variability of positioning of adjectives and possessors either before or after their heads (especially in Chukchi), though position before is more common.

Map (37): *Number affixes.* Two points stand out on this dimension - all (and only) Uralo-Siberian languages in the region have dual as well as plural marking on nouns (though the dual has been lost, if it ever existed, in Chukchi and Itelmen - also in Aleut as spoken by younger speakers, and, probably under Chukchi influence, in Sirenikski Eskimo). Secondly, typologically unusual 'singulative' affixes indicating the absolutive singular case are present in the languages immediately flanking the Gateway, namely CK, EA and Yukagir. Only one of the several CK singulatives ever actually indicates one of a natural pair (and that only sporadically) - these will be discussed further in Chapter 4. The nearest analogue to 'singulative' markers in this sense are the 'absolutive' markers of Uto-Aztecan[20]. Ket may once only have marked plural on animate nouns (as in ND). Some of its nouns that do have plurals have shorter plural than singular forms (as do CK languages); it has been suggested that some of the latter reflect earlier singulatives indicating different noun classes, both in Yeniseian and in CK (cf. Ivanov et al. 1968, 237 as regards Ket, and Skorik 1961, 150f. as regards Chukchi). Note that Chukotkan languages too distinguish plural from singular more consistently (i.e. in more case forms) on animate or human nouns than on inanimate ones. Nivkh may originally have distinguished distributive and collective plurality, the former expressed by reduplication, the latter by suffix (Panfilov 1962,

117).

Map (38): *Palatal consonant series.* This is a widespread feature of Uralic and other northern Eurasian languages, also of Russian, which was probably influenced by the former (note that I have not distinguished between primary palatal series and secondary palatalization in the context of certain vowels, as in Russian and Nenets). The feature is absent in Chukchi but present in North Slope Inuit (Inupiaq). In the former it may have been lost under Eskimo influence - it retains the ancient c/l alternation it shares with other Chukotkan, which is part of the semantically based palatal/non-palatal alternation in these languages (with the former largely giving diminutive/ frequentative meanings). In North Slope Inuit it is clearly a late development associated with the merger of (palatalizing) /i/ with (non-palatalizing) /ə/; however, there is some evidence that Proto-EA did have a palatal series[21]. Yakut may have acquired the feature on moving north into the region; this is less certain in the case of Buryat, since palatalization has also developed recently in standard (Khalkha) Mongolian (from the influence of a following /i/ that may then be dropped). Also Ket may have acquired it under areal influence (/l/ and /s/ are always palatal), though Starostin (1982, 145) reconstructs palatals for Proto-Yeniseian). The feature is imited to /nʲ/ (alongside /j/, /ć/ and /ʒ/) in Tungusic.

Map (39): *Phonemic /q/ and glottal stop.* These related features (and the uvular fricative corresponding to /q/) constitute an important bundle that typifies the Beringian Gateway region perhaps more saliently than any other phonological parameter. Successive languages that have been drawn up into the region have taken on one or more of these sounds, most recently Even and Yakut, where the /q/ is still allophonic but is on its way to phonemicization as the conditioning vowels shift[22]. The development of uvulars from velars next to back and/or open vowels is in itself quite natural (it has apparently attained phonemicization also in Uygur Turkic). EA, CK and Yukagir could all have developed their uvulars from velars next to Proto-US back vowels, as they successively entered the gravitational pull of this central Gateway trait.

On top of the uvular stop, Chukchi, Alutor and Itelmen, and the Inuit dialects immediately opposite have a phonemic glottal stop - actually a pharyngealized glottal stop in Chukchi and Alutor, as also found in northern Haida (Koryak has a corresponding pharyngeal fricative, but - as most CK - also an automatic glottal attack to initial vowels). All Na-Dene languages have a phonemic glottal stop, though most Athabaskan languages have in fact lost /q/ again by merger - all except those in the immediate vicinity of Eskimo.

A further distinction in the back region of the vocal tract, namely pharyngeal consonants, is found in some Wakashan (e.g. the pharyngeal stop and fricative of Nootka), and as mentioned, in Koryak (probably from an original uvular as in EA, where /R/ in some Inuit dialects has a pharyngeal manifestation before a following consonant). Pharyngeal fricatives are also found in some languages along the southwestern edge of the Northern Athabaskan territory (the languages further south all have uvulars and/or glottal stops, which seems to be a universal prerequisite for the development of pharyngeals). This suggests that the buildup of such sounds in the region is due to more than one wave reinforcing each other. The widespread presence of the glottal stop and of /q/ further south in western North America may reflect the presence of these sounds already in the area upon the arrival of ancestral Na-Dene[23].

Map (40): *Possessive affixes.* The marking of nouns for personal possession is widespread throughout the region (including all Uralic, EA, ND and most Altaic, although it is recent in Mongolian and Tungusic - as perhaps also in Nivkh). Its absence in CK is all the more salient (but compare Haida). Possessive suffixes could have been replaced at an early stage there by possessive pronominal forms[24], which is also true of Yukagir, although a 3rd person possessor affix is found there, possibly of Tungusic origin (and see 4.1.3 for a similar trace in CK). The prefixed markers in AE may not be that old (compare the corresponding proclitics in Tlingit and the preposed pronominal possessors in Haida); Ket too may be at the same stage as Haida (cf. Vall & Kanakin 1990, 75).

Note that the pronominal possessor of an object NP may be incorporated in the verb in Itelmen, Ku, some Al (including the Cree 'relational' conjugation), Wakashan, and some OP (in A, Ey and H its number only), a typologically unusual trait. Chukotkan displays possessor stranding with possessum incorporation rather (similar to Haida and also Eskimo)[25].

The distinct marking of alienable as opposed to inalienable possession is a feature perhaps to be associated with the preceding wave if not earlier (Nichols' 'Stratum 3'), since it is widespread throughout northwest America (including EA) but limited largely to Tungusic on the Asian side. It could have been acquired by EA on moving up into the Gateway region. Note, however, the absence of this trait in both Nivkh and Salishan (and some Wakashan).

Map (41): *Prefixation versus suffixation.* The overwhelmingly prefixing nature of ND contrasts vividly with the overwhelming suffixing nature of EA and indeed of all other Uralo-Siberian languages except CK, which historically seems to have developed increasing reliance on prefixation, although its most distinctive morphological means is its array of circumfixes (also Salishan languages have a few of these). Since there are signs of earlier suffixation in ND, the shift to almost pure prefixation may have been nudged along by contact with Algonquian and/or Salishan to the south: note that Algonquian (although it also has suffixes) is typified by prefixed directional/locational markers, some subject markers, some aspect/tense markers and nominal possessor markers, as in ND. Also Salishan has some prefixed directional/locational, nominal possessor, and tense/aspect markers - in interior Salishan also subject markers[26]. Prefixation is the marked member of the pair, since most languages prefer suffixes (VSO ones like Salishan and Wakashan can go either way), so its prevalence in ND needs some explanation (cf. Hawkins 1994, 5). The discontinuous nature of many verb stems (or rather 'themes') in ND finds its nearest counterpart in Ket, noted for its unusual system of 'infixing' (actually not infixed within morphemes but between them).

Map (42): *Prepositions versus postpositions and local case systems.* This is another feature closely associated with word order typology. All Uralo-Siberian language families in our region are predominantly SOV (except for Chukotkan, which nevertheless toes the line here, suggesting that it too was predominantly SOV at an earlier stage), so the prevalance everywhere of postpositions is expected (including in ND). The presence of complex case systems is indirectly linked to this feature through the known statistical correlation of developed case-marking systems with SOV order. There is a natural trade-off between complex case marking and post-/prepositions: the number of postpositions is somewhat limited in those Uralo-Siberian languages that

have complex case systems (some southern Samoyedic and Ugric, Yukagir and CK - but also Tungusic). Actually the line between 'complex' and 'simple' drawn here is rather arbitrary, Eskimo also having four local cases plus an equative (and a separate instrumental case in Inuit)[27].

The prevalence of complex case systems on the Asian side, in contrast to the American, is obviously associated with the predominance of dependent-marking there as opposed to the head-marking typical of the American Northwest. Some head-marking American languages nevertheless have locative suffixes (in Na-Dene these are difficult to distinguish from postpositions, except in Athabaskan directional constructions). The case system of Ket (which may be a matter of optional local suffixes and postpositions) is probably a late development under areal influence (cf. Ivanov et al. 1968, 241f.), which may also be true of Nivkh (where case inflections can bracket whole phrases).

Map (43): *Stem-internal ablaut.* This is another map with a largely negative purport: stem-internal ablaut (the alternation of stem-internal vowels under inflection or derivation) is a secondary development within Uralic (but it is reconstructible for Proto-Ugric at least). In all Samoyedic, consonant alternations under inflection are more important. Its origin within Na-Dene - through fusion with ancient suffixes - has been plotted by Leer (1979). Whether the phenomena in Na-Dene and Tibetan (both with mainly monoyllabic verbal roots) could have anything specific to do with each other, I must leave to others to decide (note that the limited ablaut in Ket concerns certain noun plurals rather than verb stems). Stem-internal ablaut, incidentally, was one of the traits seen by Sapir as criterial for 'Penutian'.

Map (44): *Stem reduplication.* This represents one of the most unexpected and isolated traits of CK languages - the nearest analogues further south in America and Asia are generally utilized for different purposes, namely much more common plural/ distributive/ frequentative or diminutive functions. In CK it forms the singulative of a limited number of (mainly) monosyllabic nominal stems and probably has something to do with bringing these into line with the canonical syllable structure of singulative noun forms, the result being the maintenance of the odd CK feature of generally having longer singular than plural forms[28]. However, its manifestation in CK could reflect an earlier stratum in the peopling of the Americas than either the Uralo-Siberian or the Na-Dene ones, if at least some reduplicated forms represent original diminutives/affective forms (as in W and Sa, where some reduplicated singular forms appear to lack any grammatical or semantic significance). Also Nivkh has some reduplicated noun stems.

Map (45): *Stress.* This map would be more transparent if proto-languages had been compared directly on it. Proto-Uralic was probably characterized by non-distinctive stress on the initial syllable with secondary stress on alternate following syllables (as in Finnic today and also Mongolian), as opposed to Turkic final stress (probably a late development - it is combined with non-distinctive stress on the first syllable). The Tungusic pattern could have developed from initial stress along similar lines as in Turkic. In Proto-CK there was probably stress on the first syllable of the (bisyllabic) stem, and in Yukagir the matter is intimately tied up with vowel lengthening in certain contexts (but final stress in certain polysyllabic word types may

reflect recent Yakut influence). EA must have gone through a common stage of syllable-weight prosody as in Inuit still today, with rather evenly distributed stress. The most interesting area is Yupik, which has developed an array of related systems of rhythmical dynamic stress, possibly initiated on the Pacific coast (where they are most complex); these interact with late-developing vowel length (as also in adjacent Aleut, where stress is much less prominent, however)[29]. Also adjacent Ahtna Athabaskan has developed dynamic stress (on the last syllable of the stem). Penultimate stress in Even may reflect Chukchi influence.

Map (46): *Switch reference and reflexive possession.* There is actually a cluster of related features here, all of which function in order to disambiguate between 3rd person referents when more than one is activated in discourse. The phenomenon in EA is not canonical switch reference for all persons (as in Papuan languages) nor obviation of the Algonquian (or Na-Dene[30]) type, but is tied up with the distinction between plain and reflexive 3rd person marking, with closest analogues on the Asian side in Tungusic and Mongolian. It is absent in other Uralo-Siberian languages (note that also Athabaskan has a plain v. reflexive 3rd person possessor marker on nouns). However, it may be comparable to the same/different subject gerund distinction of Yukagir (also Nivkh, Ob-Ugric and some SOV Hokan and CP languages), since the defective EA 'contemporative/subordinate' mood uses the same reflexive 3rd person marker to indicate identity of subject with the superordinate verb (in 4.1.3 its historical origin will be discussed). Kwakiutl distinguishes 'same as vs. different from subject' in its resumptive (incorporated) pronominal possessor construction, and Sahaptin OP has a distinct obviative ergative case affix.

Map (47): *Tense conflation in indicatives.* Proto-EA was probably like Alaskan Yupik and eastern Inuit today on this parameter (also Yukagir). North Slope Inupiaq and Aleut, with distinct past and present paradigms, have innovated and Siberian Yupik, which distinguishes past and present for active verbs, may have been influenced by Chukchi. Proto-Uralic is generally believed to have had a simple aorist conflating present and future (as in most Samoyedic still), but as Janhunen (1982, 36) points out, this probably extended also to the past before a specific past marker was introduced, so Proto-Uralo-Siberian might have conflated all three (as in Ainu and Chinese), with tense markers all deriving from participles and/or auxiliary constructions (see map 24). CK and Aleut make obligatory inflectional distinctions between all three, as does ND, although ND languages, like Eskimo and Aleut, are amongst those where complex aspect predominates over (deictic) tense and its 'tense' distinctions may be more a matter of the obligatory imperfective/ perfective aspect distinction being interpreted as respectively present or past in most situations of speech. In CK tense and mood paradigms represent a set of inflectional choices that are mutually exclusive (i.e. one may choose perfect or optative, but not both at once), just as in Athabaskan and unlike in EA.

In Tungusic the balance between aspect and tense is actually fairly even[31]; more typical of northern Eurasia is the expression of aspect with the help of auxiliary verbs. There are also 'future' or 'predestinative' suffixes on nominals in Tu, northern Samoyedic, Yukagir, CK and EA, and distinct 'future imperative' forms in Eskimo, Tungusic, Yakut, Yukagir and Samoyedic.

Map (48): *Tones.* Though the distinction is not entirely watertight, one can distinguish between true tone languages (with phonemic tone potential on every syllable of the word) and pitch accent languages with a non-automatic pitch drop associated with only one syllable in the word (the border between the latter and dynamic stress is also somewhat blurred). Both phenomena are typical of strata preceding Uralo-Siberian in North America, true tone in Athabaskan and Ket, pitch accent in some OP, Wa and S and in Nivkh (and perhaps northern Tl). Although tone distinctions cannot be reconstructed for Proto-ND, the propensity for tonogenesis (glottalized versus plain monosyllabic stems) certainly was present: glottally 'constricted' vowels (from vowel plus syllable-final glottal stop) can be reconstructed, as also for Proto-Yeniseian (see Starostin 1982, 194f). They are also found in modern Lhasa Tibetan (Old Tibetan had a glottal stop)[32]. In ND these vowels (contrasting with plain short and long ones) apparently led to the tonal distinctions in most daughter languages (they are still found in part in toneless Eyak and Tongass Tlingit - see Leer 1979, 22f), much as in Ket. Tones have been lost again in some Athabaskan (for example in many NA languages adjacent to Eskimo), perhaps also in some Coastal Athabaskan, although they may never have developed there at all.

Map (49): *Transitive versus intransitive verbal paradigms.* Transitive (or 'objective') verbal paradigms displaying agreement with objects as well as subjects typify the complex verbal morphologies of northwest America as far south as Oregon (with the exception of Haida and some W)[33], but they are also found in all the Uralo-Siberian languages of the region (also in Hungarian and Mordvin on the European side of the Urals). Janhunen (1982, 35) reconstructs an objective paradigm for Proto-Uralic (note that such a development is nowhere in evidence within Altaic). Unlike the transitive paradigms of EA and Yukagir, those of Uralic and the ND and CK languages are not built upon passive participial forms. The CK transitive paradigms are built up largely of subject prefixes and object suffixes, a pattern also found in Algonquian and some Salishan (there is much variation within the latter, however). The virtual lack of subject as well as object markers on verbs is notable in Haida and Nivkh (also Manchu and Mongolian).

Map (50): *Voiceless fricatives and lateral.* Another highly significant map in two ways. First, it reflects the absence of voiceless fricatives in all Uralo-Siberian languages except for Itelmen (also Yupik and Aleut, where they are clearly secondary, and some varieties of Inuit, reflecting original clusters or geminates). A typologically less expected single voiced series of fricatives is typical of these languages. The only voiceless segment other than the stops found in all EA (except some Inuit and Aleut where it has been lost) is the voiceless lateral, a typologically rare sound, at least for languages with such simple consonant inventories. This is clearly a Gateway areal feature, borrowed also into Chukchi from Eskimo. ND languages display an unusually wide array of laterals, including the voiceless one. Note its presence also in northern Ostyak and southern ('forest') Nenets, also in Itelmen, independent of Chukchi since it also has a plain /l/ (in Karagin Alutor its presence is part of the devoicing of all initial sonorants/fricatives under Itelmen influence). Its presence in modern Lhasa Tibetan is an innovation.

Map (51): *Vowel harmony.* Although typical of most Siberian languages this is by

no means a unitary phenomenon. The root-retracted or 'compact' harmony of CK languages aligns with Tungusic rather than Uralic (although it goes further than there by being bi-directional, any word containing a single dominant vowel being all dominant). It probably arose from a stage with no vowel harmony (like EA) in connection with its initial entry into the Gateway area, with the acquisition of uvular and pharyngeal sounds (these seem to represent the triggering factor for the dominant series, as will be discussed in 6.1). Vowel harmony in Kerek and eastern Alutor collapsed under Eskimo influence. More uncertain is how Tungusic acquired such a system - it may reflect a CK-related substratum or an areal phenomenon involving also Nivkh, since uvular (let alone pharyngeal) consonants are not reconstructible for Proto-Tungusic or indeed any Altaic family (but note the /q/-area around Nivkh on map 39)[34]. The presence of root retraction harmony in interior Salishan (abounding in pharyngeals) may represent an independent development from that in CK (it is isolated within 'Mosan' languages), but there could nevertheless be an ancient link involving also Nivkh (see 8.2.1).

Proto-Uralic certainly had palatal vowel harmony (like Proto-Mongolian and Turkic and, vestigially, also Yukagir), with back /u, ï, o, a/ alternating with front /ü, i, e, ä/. Labial harmony superimposed on this is typical of Turkic (also Hungarian and Cheremis) - but note that it is also superimposed on the much simplified root-retraction type harmony of Evenki (and to some degree also southern Tungusic, including Manchu). There is high versus low vowel harmony in some CP (e.g. Wikchamni Yokuts).

Map (52): *Vowel systems.* By 'full vowels' I mean here single vowels, ignoring vowel length and also central schwa (/ə/). CK and EA stand between regions with more complex vowel systems, though on the American side this is less marked. In general, northern Eurasia is typified by complex vowel systems and relatively simple consonant systems, whereas the opposite is true of northwest America. CK and - especially - EA may thus have reduced their vowel inventory since Proto-US times without increasing their inventory of consonants (except as regards the uvulars). Note that Inuit (apart from the Diomede dialect) does not even have a schwa besides its three full vowels. Tanaina and Ingalik Athabaskan have reduced their inventory of full vowels to three under Eskimo influence (Kari 1989, 538), just like Kerek and Alutor on Chukotka/Kamchatka.

Map (53): *Word order.* SOV languages dominate the entire region, with the increasing admixture of SVO in Chukotkan and Alaskan Eskimo perhaps a relatively recent development (as regards CK cf. the shift towards prefixation mentioned under Map 41). Word order is in general more flexible in languages immediately flanking the Gateway (e.g. Alaskan and Siberian Yupik and Alaskan Inuit within Eskimo and perhaps Even within Tungusic) than in related languages lying further away. Also Ket is probably predominantly SOV. As mentioned in connection with map 36, the SOV order of all ND languages today is unexpected for a prefixing type of language (especially a head-marking ones). This might reflect an earlier more 'harmonic' SOV stage for that family with less pronounced head marking and prefixing (if not areal influence - presumably via EA - in the direction of SOV order on an originally more harmonic head-marking type of language). Contrast the clearly demarcated zone of VSO (and VOS) languages immediately south of the Na-Dene area (Nootka at least

has both these possibilities). A good many important typological isoglosses coincide along that boundary.

3.2. Features associated with successive waves through the Bering Strait region

The typological features discussed in 3.1 which appear to have been brought into the Beringian region by the Uralo-Siberian wave can be summarized as follows:

a) a single (voiceless) stop series, plus
b) a single voiced fricative series
c) a palatal consonant series
d) genitive and accusative case marking (plus at least three basic local cases)
e) lack of adjectives (and adverbs) as distinct part of speech
f) stems predominantly of shape (C)V(C)CV(C) (except for some pronominals and demonstratives)
g) sounds /ð/ and /r/
h) an auxiliary negative (tending to morphologization)
i) an auxiliary copula (tending to morphologization)
j) morphological evidentials
k) indicatives based on participles
l) non-finite subordinate clauses
m) plural and dual noun affixes (also, in a more limited eastern region, singulatives)
n) purely suffixing morphology
o) word-initial stress
p) tense conflation on simple 'aorists'
q) possessor suffixes on nouns

These features are all at a certain level of (functional) abstraction, manifesting differently in the individual language as regards precise morphosyntactic or phonological form within particular systems of relationships. All the contemporary US languages have moreover lost one or more of them - the CK ones lacking more than any others, notably features (j), (l), (n), (p) and (q).

Ideally, it would have been desirable to submit all the features constituting this profile (as well as the overall profile itself) to statistical treatment on a global scale, to ensure that (a) they are individually likely to be sufficiently stable to have persisted so long, and (b) they are sufficiently rare (either on their own or as part of a 'bundle') to be unlikely to represent the chance result of drift. A statistical investigation of possible implicatory relationships between the individual features of the kind Nichols has already initiated for a handful of such features (beyond the widely known ones between word order and morphological type), would also be desirable - typological traits of the type listed above are not completely independent one from another, at least statistically. It is just that linguistics has not reached the stage where we can do much more than point at a few of the underlying principles of harmony and implication relating such traits[35].

In the absence of this, I have had to apply more intuitive criteria, informed where possible by considerations of unidirectionality, as suggested by grammaticalization theory. The relative stability of the features on the list is in a way vouchsafed by their

persistence within the Siberian region in the languages and reconstructed proto-languages that display them (though there is a risk of circularity here, of course). As regards their relative rarity, this is primarily a matter of 'local' rarity in the Siberian/Northwest American context (which can be read from the maps) - note that some of the features are not at all 'rare' on a global scale (e.g. (d), (g), (l) and (o)), but they nevertheless serve to highlight the Uralo-Siberian 'profile' against immediately flanking areas. More important is the question of implicational relationships between them. As far as I can judge there are no such hidden dimensions on the list, apart from the obvious definitional fact that languages which are of the synthetic type will tend to have morphologically expressed categories (cf. (h), (i) and (j)). Note that I have specifically not added 'nominative-accusative alignment', 'dependent marking' or 'SOV word order', though these are all broadly represented amongst US languages.

Features apparently introduced by the preceding ('pre-Na-Dene'?) wave include:

a) glottally constricted vowels (and an ensuing propensity to develop tones)
b) a tendency to increasing reliance on prefixation
c) stem ablaut (and discontinuous verb stems)
d) lack of /p/ and sparsity of other labials apart from /w/
e) attributive adjectives as a distinct category
f) subordinating particles
g) indefinite object and subject prefixes
h) enclitic particle negation
i) reflexive vs. plain possessive affixes

The following may also have been brought in at this time, although they were probably already represented on the American side[36]:

a) noun incorporation
b) complex aspectual distinctions (inflectional)
c) ejective stops (as well as voiced vs. voiceless ones)
d) suppletive plural verbs
e) uvular consonants
f) monosyllabic verbal stems
g) voiceless /ɬ/
h) classificatory verbs

Features definitely in place in Northwest America already, associated with a 'Mosan' - or some still earlier - wave included:

a) numeral classifiers (and noun gender)
b) a propensity for complex consonant clusters
c) V(S)O word order
d) a phonemic glottal stop
e) inclusive vs. exclusive 1st person
f) lexical affixes
g) stem reduplication
h) distributive affixes on verbs
i) a high degree of overlap between verbal and nominal stems

j) morphological applicatives
k) a morphological inverse

Of these, (d) and (f) seem particularly deeply entrenched, covering a large portion of western North America, but also (a), (e) and (g) would appear to be very ancient in the area. Three major clines which seem to have been in place across the Gateway for a long time are:

a) decreasing complexity of vowel systems and increasing complexity of consonant systems going from west to east
b) increasing domination of aspect over tense (as the marking of the latter becomes less obligatory) going from west to east
c) increasing head-marking as opposed to dependent marking going from west to east

The last of these features can be related to the general increase of morphological polysynthesis as one moves from the Old World into the New - although Ket, which has strong typological links to the 'pre-Na-Dene' stratum in North America, forms a notable exception on the Asian side (this will be returned to in 8.2). As discussed in Fortescue (1992), polysynthesis is a geographically limited phenomenon which usually develop one-way (i.e. from ordinary synthesis to polysynthesis): this path once taken it is unlikely to be reversed short of a radical collapse and restructuring of a language. I discuss in that context reasons to do with language acquisition and the attainment of a new kind of equilibrium between stem and bound morpheme inventories that might favour such a development once it has reached a 'point of no return'. Given that languages further south within the Americas are less synthetic than the ones we are dealing with, the geographical increase in polysynthesis in northeastern Asia across to its maximum in North America, again receding to the south, may also reflect a chronological build-up, the effect having increased with each new entry into the New World, where the most polysynthetic languages in the world - Eskimo - are still spoken on either side of the Gateway itself[97].

Another broad cline on the Siberian side is from languages with complex morphophonemic junction phenomena in the north to agglutinative ones with simple morphophonemics in the south - Altaic intrusions from the south (especially most recent arrival Yakut) excepted. Complex morphophonemics dominate on the American side, this is by no means all-pervasive. Within America there is a cline from languages with complex phonological systems in the west to ones with simple systems in the east (within Eskimo this is also true, though these languages are as a whole phonologically simpler than their continental neighbours).

It is against this background that the more idiosyncratic results of contact and substratum relationships in the region need to be viewed. Typological features which do <u>not</u> seem to be so relevant as historical markers in the region (despite expectations from a global perspective in some instances) include those like SOV word order and the fusion of pronominals as possessive affixes on nouns and/or as person markers on verbs which are simply too common amongst the world's languages; the same can be said of other features like ergativity or switch reference systems which may have diverse manifestations and paths of origin. This does not mean that they may not act as historical markers in other regions of the globe, of course. Some such features, involving for example the replacement of eroded morphology by analytical

constructions, may have arisen independently through 'drift' (i.e. the blind groping towards the resolution of internal tensions/assymetries) in more than one unrelated language of a region, though it can be argued that it is unusual for a previously non-existent grammatical category in a language family to appear out of the blue without contact of some sort being involved.

Throughout the following chapters I shall apply the typological template that has been unearthed, the hypothetical original Uralo-Siberian profile, to bolster various arguments for specific morphological (and other) developments away from a common starting point within the individual component families. This is precisely what one does with the reconstructed phonology of a proto-language when applying the usual comparative methods (I shall simply extend it to morphosyntax as well). Note that this method is open to disconfirmation: if it should turn out on internal evidence that some feature proposed for hypothetical Proto-US clearly arose secondarily within one or more of the ingrediate families, then it should probably be removed from the common profile.

3.3. Typological anomalies as clues to reconstruction

It can be argued that all areal traits must once have been historical markers (i.e. associated with a particular language/family), but not vice versa[36]. Take an areal trait like the presence of uvular consonants in the Beringian Gateway region: this feature must once have belonged to a single language family in the region at a time when flanking languages did not have it, although in this case it is not clear what that language family might have been. Pre-Na-Dene and/or some kind of 'Mosan', for example, could both have picked up the trait from remnant Indian groups remaining in ice-free Alaska during the late Pleistocene (of which there is some evidence - see the possible relevance of Ushki level 7 discussed in chapter 7). But one of them - or both of them independently - could also have imported the feature, regardless of whether still earlier languages in the region had it or not. The actual route by which such a trait reached the Gateway may have been quite complex, and (pre-)Na-Dene, say, could have acquired uvulars already in Siberia, e.g. in the Sayan region, independently of any contact with Mosan languages on Beringia. Nichols stresses the origin of typological features in places rather than specific languages, and indeed, from a broad perspective, they do display a certain detachment from individual languages/families passing through a region. It is nevertheless the individual language that bears the trait along with it. The physical drift in the region we are concerned with has - with few minor reversals that we know about - always been from west to east. Many potential historical markers typifying single language families that have passed through the region - especially more typologically idiosyncratic ones - must never have been picked up by neighbours and been reinforced as areal traits; eventually they may have changed or died out with the languages concerned.

The big question is, then, are there any principled ways in which we can distinguish between the two phenomena - areal features and those features that are likely to be true historical markers - in a particular region of the world? There is more than one approach to this. That espoused by Nichols (1992) applies statistical methods on a global scale to try and unearth certain typological features that tend to be long-lasting and stable in sizable parts of the world and to test for which of these features

tend to cluster and reinforce each other. Results of such investigations can in turn be tentatively related to universal mechanisms - for example, of mental processing, as in Hawkins (1994) - that can be invoked to explain the typological clustering. A related but somewhat more local approach is represented by the present book, which attempts to integrate typological considerations with the comparative/historical investigation of a particular medium-sized region.

These two approaches are compatible, only the perspectives different. The second kind is on firmer comparative ground but is much more limited in its possible spatio-temporal extension, its main advantage over the traditional comparative method on its own being that it can extend the time-scale of the latter (with luck!) by perhaps a few thousand more years, certainly not much more. Its goal is to posit a typologically reasonable framework out of which the specific languages of the region that actually are genetically related can be supposed to have emerged. This is not really possible - or even desirable - from Nichols' broader spatio-temporal perspective. One should not expect all of the generalizations that can be made at a global level to apply equally well within a more limited spatio-temporal perspective. The Bering Strait region is nevertheless well suited to testing global predictions concerning 'good' historical markers on a more local scale, since the geographical nature of this bottleneck must have restricted the number of language families that could have passed through the Gateway at any one time, given the sparsity of population in the Arctic at all times and the relatively slow spread of both people and languages through the region[39].

The typological perspective can help elucidate which traits that are represented in a region might be potential historical markers. As a minimum requirement, these should be globally fairly unusual and preferably not fall out from some other typological feature commonly linked to them and also present in the languages concerned (e.g. alienable possession marking and head-marking, or nominative-accusative alignment and SOV word order, which often go hand in hand - cf. Nichols 1992, 114). Traits which specifically break such expectations (e.g. the monosyllabic verbal roots in dependent-marking Itelmen - compare Nichols 1992, 267) are diagnostically much more significant and may indicate substratum effects. However, one must always consider carefully the chronology of the feature concerned within the individual family, as revealed by internal reconstruction. What is needed then is a language-specific examination of each of these features, to see whether reasonable, natural scenarios can account for their internal genesis, or whether it looks as if something anomalous, suggestive of external or areal influence, has intervened. The recognition of anomaly is of the essence.

It so happens that the area we are concerned with contains good examples of 'areal' features which upon closer examination turn out to be historical markers of individual language families that just happen to have arisen independently in more than one family of the region. It also contains instances of anomalies or 'catastrophes' in individual languages that are typologically unexpected and may reasonably be explained in terms of interference from some other specific language or language family in the region. Actually the two cases lie on a continuum that ranges from instances where completely independent genesis of the feature in question seems the only explanation and instances where the source of the feature in one language is clearly the result of contact with another (see Thomason & Kaufman 1988 for a useful overview of the various types and degrees of contact that can be found amongst the world's languages). In between come cases where the long-standing presence of a

feature in neighbouring languages appears to have triggered or nudged its otherwise potentially quite natural development in a given language (or have prevented its demise if already in place), for example via bilingualism in a border region. The extreme cases are not so difficult to spot, it is in the middle ground that doubt may persist.

All three positions on the continuum can be illustrated for our region in the area of ergativity, which - as one possible selection from the array of morphological 'alignment' types - tends to be a rather stable historical marker on a global scale according to Nichols (1992, 166ff). An example of probably parallel independent development of this feature can be seen by comparing ergativity in Eskimo with the same phenomenon in, for example, Tsimshian. First, note that the phenomenon in Tsimshian may not be genetically isolated - Oregon Penutian languages, which may be remotely related, also have it (although this is not the case with the still more remotely - if at all - related Californian ones). I am not sufficiently versed in any of these languages to state conclusively that the origin of ergativity here has been established beyond any doubt, but Trask (1979, 393) at least includes the Nass-Gitskan variety of Tsimshian amongst those languages (actually all North American ergative languages apart from Eskimo) which have developed a 'Type A' ergative morphology from an earlier passive. If this is so, then ergativity in Tsimshian clearly has a different source from ergativity in Eskimo, since the latter belongs to Trask's 'Type B' language, having developed its ergative clause from a possessed nominalization (actually a passive participle - see Fortescue 1995b for a discussion). The rather special kind of split ergativity displayed by the Sahaptian (Penutian) languages of Oregon, as described by Rude (1991) for Nez Perce, seems to have a different origin (from directional morphemes used originally for obviative marking, according to Rude). The unexpected ergative construction found in the Vakh dialect of Ostyak, as described by Comrie (1981, 130) is quite isolated within Uralic (and hence surely not a historical marker of anything external to itself); it may have a different origin again, to do with topic/comment structure.

At the other extreme, we have every sign of a 'catastrophe' having affected the originally ergative morphology of Aleut when compared with the stable and typologically fairly main-stream phenomenon in Eskimo. In 2.1 we saw the 'domino' effect whereby the phonological syncretism of certain originally distinct case markers led to the complete reshaping of Aleut morphosyntax, in particular to the replacement of Eskimo-type ergativity by a distinction between anaphoric and non-anaphoric clause types. The former uses the residual morphology of the EA ergativity system and indicates an anaphoric topic (or 'outer subject'), while the latter (corresponding to the accusatively organized 'indefinite object' or 'antipassive' construction in Eskimo) is used - with intransitive verbal inflection - whenever the object is an overt NP. Whether this 'catastrophe' was due to a radical language shift by a substratum population (perhaps specifically Na-Dene speaking) or, as Bergsland thinks, was an independent phenomenon, is debatable, but the far-reaching nature of the reorganization went at all events unchecked for some reason, and the anomalous nature of the results can be seen in the extremely rare nature of certain aspects of Aleut morphosyntax amongst the world's languages[40]. This should be seen in the context of the general simplification of Aleut morphology and the considerably reduced productivity of its derivational apparatus when compared with Eskimo, both surely diagnostic signs of rapid reorganization of this sort (a parallel statement, note, can be made for Itelmen

vis-à-vis Chukotkan).

Such 'catastrophes' must eventually repair themselves (if the language survives at all, which, alas, does not look like being the case with Aleut for very long), bringing the language back in line with more universal typological tendencies as it is passed on from generation to generation. It may be that such anomalous events are more common in the prehistory of language families than we tend to think, and this would cause havoc for attempts to reconstruct earlier stages of these families - unless we draw upon the ancillary perspective of areal typology to try and correct for the biases introduced. This is why it is so important that historical linguists should be familiar with the typological literature - in order to spot what is anomalous and therefore demanding of some special explanation. In the present case, the common historical origin of ergativity in Eskimo and its vestigial reorganization in Aleut is not in doubt - it is rather the relevance of ergativity as a historical marker here (if one regards it as a hallmark of the Eskimo-Aleut family it is oddly absent - or at least transformed - in the other major branch of the family).

Finally, ergativity in Chukotkan (but not Kamchatkan, i.e. Itelmen), illustrates a more tricky intermediate case, one where the phenomenon can be shown, because of its typological 'oddness' and the difficulty of recreating a natural, purely internally motivated account of its genesis, to have arisen in all likelihood through 'nudging' from without (see Fortescue 1997a for a detailed account). The 'nudging' must have come from Eskimo (where a type of ergative construction that could have triggered the precise development exists), either through contact or through more radical population mixture and language shift. The difficulty of deciding on the diagnostic status of the feature in this case derives in part from the indirectness of the causal mechanism, and I fear that such complexity is probably the norm when it comes to structural contact effects. Such changes must occur on a much more subliminal level, and more gradually, than the borrowing of vocabulary. The nub of my argument concerning this particular contact phenomenon is that ergative clause structure (mainly marked by NP case) has been superimposed in Chukotkan on already complex transitive verbal paradigms of a nominative-accusative type. Critically, these contain inverse forms based on an earlier passive still found in non-ergative Itelmen[41]. Ergativity in these languages has developed neither from a passive (which produced an inverse rather) nor directly from a passive participial construction as in Eskimo. In a number of ways it is typologically anomalous, for instance in the array of case markings in which it manifests on nominals - instrumental or locative depending on noun class (neither option on its own unusual), but with a special ergative suffix on pronominals that looks like the ergative ('relative' case) marking of the neighbouring Eskimo 3rd person pronoun. The only scenario that makes historical sense of the situation is that of Chukotkan adopting the Eskimo-type construction - specifically in the perfect tense, which is based on a nominalization (passive on transitive stems). This must have occurred during an early, intense contact episode, possibly when inland Chukotkans are believed to have interacted with coastal Eskimos in the formation of the so-called Neo-Eskimo cultures about 2,000 years ago. Language shift by many Eskimos to Chukotkan at this period is the mechanism assumed.

Historical hypotheses based on typology alone are always going to be tentative, but they set up useful frameworks for testing explanations of individual anomalies within proposed historical groupings. If they further explain other anomalies they are reinforced; if they fail to do so they may have to be rejected. The hypothesis of a

Uralo-Siberian historical unity, in particular, would seem to make good typological sense, and it can indeed be shown to shed light on a number of specific historical problems (this will be seen in detail in following chapters). Some of the 'anomalies' within this hypothetical framework that call out for closer investigation if it is to be reinforced are, for example, the prefixes and circumfixes of Chukotko-Kamchatkan, also the noun reduplication and 'compact' vowel harmony of this family, which seem, **primae facie**, out of context amongst the otherwise suffixing and (apart from EA) palatal vowel-harmonizing US languages. Also the unique grammaticalized focus system of Yukagir and the presence in Eskimo-Aleut of plain versus reflexive 3rd person possession markers (at the heart of the grammars of these languages yet isolated within hypothetical Uralo-Siberian) call out for a historical explanation. As it turns out, both of these particular phenomena involve morphological elements common to Uralo-Siberian (as will be seen in chapter 5), simply extended to perform new functions. By trial and error one can eventually determine whether the extended typological framework is going to add any significant explanatory dimension across the board to the purely historical reconstruction; if it doesn't, it can be adjusted or replaced. It could have been the case, for example, that the alignment of EA reflexive 3rd person affixes with the corresponding morphemes in Tungusic offered a more coherent historical picture. It doesn't. As it turns out, Uralic plain person markers do cast light on Eskimo-Aleut 3rd and 4th person possession markers. In return, Eskimo-Aleut may add something to the historical reconstruction of (pre-)Uralic second syllable vowels (and/or final consonants) at a stage before original vowel distinctions after the first syllable were obscured by vowel harmony.

Returning to Nichols' concept of the 'historical marker', it should be apparent from what has been said above that I interpret these so as to include areal features that are also historical markers of wider genetic affinities (there are numerous other historical hallmarks of individual language families that are neither areal nor historical markers). Areal features must of course have spread initially from one or more specific families. They may also be lost again, either **in situ** or by groups moving out of an originally coherent area. Historical markers associated with a particular language family may become either geographically spread across several families or discontinuously distributed within the same family; only in the former case would we want to call them areal features. I would suggest, however, that it is primarily because of areal reinforcement that 'historical markers' may remain for a long time in a geographical region, becoming 'areal markers' if they spread much beyond the original family; there is nothing intrinsically 'deep' or 'long-lasting' about them, as far as I can judge[42]. They reflect rather the result of historical accident, including the original laying down of global 'clines' by initial linguistic colonialization.

It is important to remember (especially for for those linguists who remain sceptical of the notions of 'substratum' and 'areal pressure', etc.) that traits resulting from contact do not necessarily assert themselves only at one discrete period in time, subsequently either expanding their sphere of influence or disappearing entirely from the scene. They may linger on recessively after an initial contact episode, borne by pockets of monolingual or bilingual speakers that remain after the bulk of the 'donating' population has switched entirely to the 'receiving' language and again lost the trait concerned. If one or more of these minority groups in turn expands or reasserts itself the trait could be reintroduced amongst the majority that had switched entirely (or reinforce it if it was still latently present within their language). This could

result in a situation where the same 'external' trait comes to affect the natural internal drift of a language at two distinct stages in its development, complicating attempts to reconstruct the order of successive changes (and obscuring the unitary source of the trait). Substratum effects (like any other strong contact effects) may take generations to stabilize.

To round off this chapter on typology, I would like to suggest that the features which I have already listed in 3.1 are indeed rather good regional candidates as historical markers for Uralo-Siberian (contrasting with those I list for 'pre-Na-Dene' and some more indeterminate earlier wave). By contrast, no such bundle of independent features can be unearthed linking, say, Eskimo-Aleut and Wakashan: the link Swadesh saw between these families (mentioned in 2.5) appears to be based primarily on the purely suffixing polysynthetic nature of both families (more specifically the shared trait of 'suffixing incorporation'). There are indeed a number of other traits shared by the two families, but those that are not wide-spread amongst the world's languages all seem to fall out from this overall type (which may not even be original in Wakashan - compare note 26). These include the high degree of recursivity of their morphologies (with alternating nominalizing and verbalizing suffixes possible in succession), the formation of portmanteau mood + person inflections (in a variety of subordinate as well as superordinate mood paradigms), and the generally transparent, cumulative scope of successive suffixes ('sentential' ones standing closest to the final inflection).

Once again I must stress that my use of the term 'Uralo-Siberian' is to be understood (for the time being at least) as referring to a mesh rather than to a strict genetic unit for which a proto-language can be reconstructed in detail, although, as will be seen in the following chapters, it does approach the level of reconstructability (on that score the Eskimo-Wakashan hypothesis, for example, is a non-starter). The bundle of typological features characterizing the US languages alerts us to the possibility of a deep historical relationship (the traditional role of typology in historical reconstruction), and can also suggest routes for more idiosyncratic developments in the individual language families concerned, as will be illustrated in the following chapters. This includes cases where a particular language family appears to have lost a once common feature. To explain egregious divergences from the common profile other feature bundles typifying earlier 'stocks' or 'meshes' in the region may in turn be drawn upon to suggest likely sources of interference, although it must always be borne in mind that idiosyncratic features may develop internally within any family.

From the larger number of features discussed in connection with maps 9 - 53 I have already eliminated obvious cases of independent innovation and the results of purely local contact. Of course doubtful cases, intermediate on the continuum discussed above, do exist, but these can be lived with, as 'areal features with possible historical purport'. Perhaps the presence of /q/, here assigned tentatively either to pre-Na-Dene or 'Mosan', is a case in point. Its importance for the region is not diminished by this uncertainty. What would help decide in such cases is a richer theory of implicational universals: at present all we can say is that the presence of uvulars in a language implies the presence of velars, something which most of the world's languages have. But take a case like classificatory verbs in Na-Dene, where we are dealing with a particularly rare feature - here the presence of the same feature amongst Mosan languages is significant, but it would becomes still more significant if evidence of a (more or less) universal implicational relationship between classificatory

verbs and, say, numeral classifiers could be shown. In that case the feature could be said to act as an indirect historical marker indicative of a further link to Nivkh (and its presence in ND attributed to contact with Mosan languages). If, on the other hand, a universal implicational relationship could be shown with noun gender systems, the feature could be an indirect historical marker indicative of a link to Ket rather (note in fact that Athabaskan has covert noun gender)[43]. Within Uralo-Siberian similar conclusions could be drawn as regards attitudinal affixes, if these could be shown to be in an implicational relationship to morphological evidentials on a global scale. If so, the case for associating the latter feature with the US profile would be bolstered (the lack of the feature in CK being explicable in terms of a preference for equivalent particles, a possible substratum effect).

Although the linguistic picture that is being developed can be used as evidence for or against specific archaeological/ anthropological scenarios, it must ultimately fall or stand on its own merits. It is of course to be hoped that it will be compatible with what archaeology and anthropology can tell us of such things as the distribution of genes and cultural changes in the region. With luck - and allowing for the different rates of spread of each of these factors - there will be just one configuration where the 'tree rings' of linguistic layering and the 'Carbon 14' chronology of population movements provided by archaeology interdigitate uniquely. This dimension will be spelled out in Chapter 7. Meanwhile, we must turn to a detailed and rather technical morphological comparison of the Uralo-Siberian languages. Readers not familiar with any of these languages might want to skip chapters 4 and 5, although they contain crucial evidence for the hypothesis of their genetic relatedness.

Notes to Chapter 3

1. The sources I have consulted for the maps are too numerous to list individually, but special mention should be made of Campbell & Mithun (1979), Thompson & Kinkade (1990), Comrie (1981), Boas (1911), Sinor (1988), Krauss & Golla (1984), Nichols (1982), Sherzer (1976), Spuler (1968), Serebrennikov & Gadzhieva (1986), and Skorik (1968).

2. Sherzer (1976, 139f.) includes among central areal features for the Northwest Coast (which does not include Eskimo-Aleut or Athabaskan): glottalized stops, the presence of /q/, a single voiceless fricative series, a variety of lateral phonemes, alienable/inalienable possession, numeral classifiers, verbal reduplication and locative-directional markers on the verb. Specific to a northern sub-area are three stop consonant series, an active/stative opposition, glottalized continuants, and classificatory verbs (according to form, shape or number of object).

   Another important linguistic area at the periphery of the region we are dealing with is that embracing Sakhalin, Japan, Korea and the adjacent Asian mainland (perhaps the whole of Manchuria too in a broader area), only this one has been largely obscured by the more recent spread of Tungusic (later also of Japanese, Chinese and Russian). Among features typical of this latter area are pitch accent, lack of/minimal person marking on the verb (linking Japanese, Korean, Nivkh and Manchu at least) and of affixed case marking on nouns, root retraction harmony (traces of which may be found in Japanese, Korean and Ainu

as well as Nivkh), lack of passive participles (notable in transitive relative clauses), stem reduplication (especially onomatopoeic), and numeral classifiers.

3. What is vague is not so much the groupings (which are merely controversial) as my selection of languages typifying them. My sources are very selective and vary in level of descriptive detail, so a given trait may in fact only be typical of some of these varied languages. I have taken into account most of the languages on which accurate data is readily available in published descriptions or theses in the library of the Department of Linguistics at the University of California at Berkeley, but this does not mean that a given trait is necessarily attested in more than one language within these groupings. In the case of Coastal Athabaskan, for example, the sole language source is often Hupa (except when the feature concerned is among those listed in Thompson & Kinkade 1990 or Sherzer 1976 for other CA languages). Sahaptin, Chinookan, Coos-Siuslaw and Takelma (at least) are distinguished where relevant within OP, but the important distinction between the Coastal and the Plateau sub-groups is not maintained (nor is the likelihood that some CP languages may be more justifiably aligned with OP dealt with). Tsimshian (which should more accurately be termed Tsimshianic) contains at least three distinct languages, Coastal Tsimshian and closely related Nass (Nisqa'a) and Gitskan.

4. Only in Chukchi does this now also provide a tense paradigm for verbs ('Present 2' **nə- -qin**, etc.).

5. Vall & Kanakin (1990) call members of this class, which includes demonstratives and numerals, 'specifiers'.

6. The former term is used by Swanton (1911, 237), the latter by Enrico (1984, 234), who points out certain misanalyses on Swanton's part in connection with these morphemes. They include a causative suffix deriving from a full 'have' verb **da(a)**- (parallel to CK **ðəntə-** 'have (as)'), as in the following (Swanton's rendition): **la-qoya(-)da-s** 'he caused it to be dear', i.e. 'he valued it' with causative auxiliary **da-** and verb stem **qoya-** 'be dear' (Enrico has **kuyee-ɬeehl-da-ʔaaw-aa-n** '(he) came to love (them)' with an inchoative morpheme between the stem and the 'have' suffix). Compare Chukchi **tenŋ-u nə-lgə-muri** 'they laughed at us' with auxiliary **lərŋ-** 'consider as' following the essive form of the main verb **tenŋ-** 'laugh', also **ɣici-te ɣe-ntə-linet** 'they (precisely) looked for them', with **-ntə-** from **rət-** 'have as' following a gerundial form of the verb **ɣici-**'look for' (a contrastive nuance is produced by this latter construction). 'Be' morphemes are also among the CK auxiliaries.

7. However, auxiliaries of this sort may well be an old US trait which has simply been further grammaticalized in Eskimo. Note the use of such a morpheme, **a-** 'be', amongst Aleut's auxiliary constructions, as in **PiitraX haqa-l a-Xta-kuX** 'P. apparently came', where the evidential suffix **-Xta-** is attached to the auxiliary. Aleut auxiliaries often correspond to 'sentential' affixes in Eskimo (compare West Greenlandic evidential **-sima-**), but their range is greater (including ones meaning 'do yesterday', 'do today', 'do tomorrow', related to nominals of similar

meaning).

8. As in Nenets from Proto-Samoyedic. This contrast is also found in Itelmen (at least in unstressed syllables) and is reconstructible for Proto-Athabaskan.

9. Note that Itelmen too has glottalized nasals and laterals.

10. The origin of such marking may be reflected **in ovo** in the redundant personal pronoun plus possessive suffix construction of Nganasan (also other Samoyedic and Ob-Ugric), as in **miŋ n'ini-mi?** 'our older brother' (lit. 'us older-brother-our'), which could eventually spread to all 3rd person possessors too, as in EA. In fact Turkic - apart from Yakut, which has lost its genitive - also has double-marked possessive constructions, reserving the construction without genitive marking of the possessor for more 'intimate' possession, as in Yukagir. Chukotkan, on the other hand, has double-marking of transitive subject on the subject NP and the verb of its ergative clause, like Eskimo. Kwakiutl may have double possessor marking in its incorporated possessor construction.

11. The phenomenon of adjunct incorporation may be related to a tendency in the region to treat noun phrases like plain nouns syntactically, with very close sandhi-like fusion of the components, most marked in Nivkh, which by and large only has noun incorporation of the canonical kind - but also Eskimo NPs are bound by strict word order (unlike the clause) and may involve assimilatory and other boundary phenomena between constituents. Whole NPs in Eskimo commonly form bases to which suffixes are applied as a whole (a phenomenon also found in Nootka, which also shares attribute stranding with Eskimo). In Sa and W, adjectives (also numerals), not being distinct from verbs, can combine with nominal field affixes, the result being similar to adjunct incorporation (there are also adjective and adverb-like suffixes).

12. The only reason I don't mark them as such on the map is that they consist not just of affixes with a concrete lexical sense but also (or instead) of a heterogenous string of morphemes of an aspectual nature, typically also involving a specific choice of stem aspectual variant. They can sometimes be compared with the proclitic instrumental 'operators' of Haida, also similar morphemes in Uto-Aztecan and many Hokan and Penutian languages (also Salishan, where they are usually suffixed), or to Haida locative-directional morphemes (suffixed). Locative-directional affixes are suffixed in most Penutian, prefixed in Algonquian and either suffixed or (less commonly) prefixed in Salishan (in Ts and Tl they are proclitic). Many Penutian and Hokan languages in Oregon and Northern California combine both locational-directional and instrumental affixes in profusion, reflecting perhaps a convergence of areal pressures. In purely suffixing Wakashan all lexical affixes are of course suffixed, but there may be traces of once prefixed elements in the guise of certain stems of an adverbial nature or otherwise semantically subordinate to a following verbal suffix.

13. With the former having an active meaning on intransitive stems, a passive one on transitive stems, like the tenseless participles in most CK except Chukchi, where

-lʔən can now only have a passive sense with negative verb forms.

14. As regards word-final /ŋ/, this has merged in eastern dialects of Inuit Eskimo with /k/, but note that the alternation of final nasals and corresponding stops was being exploited at the time of contact in parts of eastern Canada and Greenland as a mark of female as opposed to male speech (compare Yukagir /š/ versus /c/ in connection with Map 28 and Chukchi /r/ versus /tʻ/ in connection with Map 27).

15. Thus compare the following two Chukchi sentences, of roughly equivalent meaning, where the second involves object incorporation and raising of indirect to direct object:

ətləɣ-e akka-ɣtə qora-t təm-nenat əkək qora-nmə-nen
father-INSTR son-ALL reindeer-PL kill-3s/3p.AOR son reindeer-kill-
'the father killed the reindeer for his son'

ətləɣ-e
3s/3s.AOR father-INSTR

In Eskimo there are applicative suffixes like ***-utə-**, which produce pairs of verbs, such as West Greenlandic **aalliR-** 'fetch s.th.' versus **aalliut(i)-** 'fetch s.th. for s.o.', where the object of the second form is the recipient.

16. Curiously enough, the particle concerned, **ta**, is almost identical in form to the Nivkh particle **tʻa** used in the negative imperative.

17. In Algonquian this has been completely grammaticalized and integrated into the transitive verbal agreement system. In Athabaskan it is a matter of the relative discourse saliency of 3rd person participants rather than of a strict person hierarchy being broken as in Algonquian (2nd > 1st > 3rd proximate > 3rd obviative) - as regards 3rd person the two types of system overlap functionally.

18. Nakayama (1997) describes the situation in Nootka, where the relevant hierarchy is 1/2nd > topic 3rd > non-topic 3rd person. He prefers not to use the term 'inverse' for the phenomenon since the suffix concerned can also be added to intransitive verbs in an impersonal subject sense (but compare the probable source of the original CK inverse prefix in an impersonal 3rd person subject marker).

19. There is morphological evidence of an earlier period when there was more suffixation, however. Possibly contact with the VSO languages further south may have played some role. Some modifiers precede the head in Tlingit, note.

20. Although number is not obligatorily marked on stems in Ut, when an plural marker is added in Aztec and Serrano, for instance, the absolutive marker is dropped.

21. cf. the 'tɬ' versus 'tɬ' and 'c' versus 'c' relationship between Eskimo and Aleut discussed in 2.1, and the j-initial words in Sirenikski corresponding to n-initial elsewhere, suggesting a */nʻ/.

22. In Yakut the situation is more complex than in other Turkic, since /k/ rather than /q/ ([X]) appears not only before front vowels but also in the vicinity of /u/ and /ï/. Vowel height appears to be involved, as in Tungusic, from which there may be influence. There are certainly numerous loans from Tungusic (and Russian) with /k/ rather than expected [X] before and after /a/ and /o/. There may have been a parallel, independent development of uvulars in the areas surrounding Nivkh (affecting Nanai) and Ket (affecting Selkup). According to Austerlitz (1990, 20), uvulars in Nivkh may have arisen from /k/ before open vowels (as also in Nanai); Panfilov (1962, 86f.) points out that uvulars rather than velars are regular intially before /a/ and /o/.

23. The presence of /q/ in the Yuman branch of Hokan in southern California is particularly interesting, since it has spread to the nearest Uto-Aztecan languages encroaching from the east through a mechanism analogous to that I envisage for the effect of this Beringian trait on incoming languages from the west: as Hinton puts it, the Yuman distinction between /q/ and /k/ 'froze' the Takic back allomorph of /k/, providing it with phonemic status (Hinton 1991).

24. CK pronouns do not have the same emphatic function as in EA for example (there are separate emphatic forms). As will be discussed in 4.3, the possessive forms of CK pronouns look like innovations. CK could have lost its original US possessive suffixes under influence from pre-ND or Mosan languages which had prefixes rather: this would be parallel to the replacement of such suffixes in Estonian by the neighbouring Indo-European analytic construction.

25. Note thus Itelmen:

qnaŋ ʃa?l qol-qz-a ɬ-kepne?n
at.once knife.PL break-IMPERF-FUT-3p.3p.POSS
'Their knives will start breaking at once'

Comparable examples in Kwakiutl, for example, can be found in Boas (1911, 538f.). There is some overlap between this construction and the applicative construction ('do s.th. with respect to -') found in Salishan.

As regards possessor stranding, compare Siberian Yupik:

juɣ-əm aŋja-a-nit-uq
man-REL boat-3s-be.in-3s.IND
'the man is in his boat'

with Alutor, where the possessor is raised to absolutive subject:

ɣəmmə tə-sejnik-av-ək
I.ABS 1s-teapot-have.hole-1s.AOR
'my teapot has a hole in it'

An alternative analysis of the phenomenon in Chukotkan as a kind of zero applicative construction is possible, however.

26. Thompson (1979, 732) suggests that Proto-Salishan may have displayed considerably more prefixation than the modern languages. Silverstein (1979, 658f.), following Sapir, points out that in Penutian, on the contrary, prefixation is a more recent development in those branches that display it. The full-blown suffixing morphology of Wakashan and Eskimo-Aleut probably represent

independent parallel developments from different starting points (one VSO with some prefixes - compare note 12 - and the other SOV without).

27. Various syncretisms and restructurings have taken place in the Aleut case system, especially on personal pronouns, yet there is an interesting parallel between the results of these changes and the case-inflection of personal pronouns in northern Samoyedic. In both, the stem is not the pronoun itself but a postposition, inflected for person and case. In Nganasan, for instance, this may be optionally preceded by a pronoun in conflated nominative/genitive case (EA languages do not distinguish absoultive and relative on pronouns either). Thus Atkan Aleut locative 1s **ila-miŋ**, 2s **ila-mis**, ablative 1s **ila-miiŋ**, 2s **ila-miis**, based on stem **il(a)-** 'in' (dative 1s **ŋus**, 2s **imis** are based on the actual EA pronominal stem ***ə↓-** rather). Compare Nganasan locative 1s (**mənə**) **na-nunə**, 2s (**tənə**) **na-nuntə**, dative 1s (**mənə**) **na-nə**, 2s (**tənə**) **na-ntə**, based on general locative postpositional stem **na-**.

28. The plural marker is non-syllabic **-t**. Thus singular **tumɣə-tum** 'friend', pl. **tumɣ-ət**. The canonical shape of singulative noun forms is (C)VC(C)V(C)-(C)V(C). Note that CK reduplicated **məɣməɣ** 'wave' may go with Proto-Inuit **malək** 'wave', so syncope and ensuing compensation may have been involved in some cases.

29. It is conceivable that Yupik could have retained the principle of alternating rhythmic stress as such from a much earlier Uralo-Siberian stage, but it is probably more likely an innovation spreading from the Pacific Coast variety of Yupik (Alutiiq). Aleut could have developed its weak equivalent of the phenomenon from adjacent Alutiiq.

30. See Leer (1991, 166) for the 'salient' versus 'recessive' bound 3rd person pronominal distinction in Tlingit. It is close in nature to Athabaskan 'obviation', where the choice (according to animacy and discourse saliency) is between distinct nominal and post-positional 'possessor' markers (see Thompson 1994, who describes the distinction in these terms). Unlike 'canonical' obviation in Algonquian it does not involve marking NPs as obviative/proximate, but the function is much the same. It may be a case of a preexisting 'inverse' construction becoming linked to an animacy hierarchy, just as a preexisting passive seems to have became linked to a person/agency hierarchy of the Algonquian type in CK.

31. Tense is obligatorily marked in the indicative at least, following any aspectual affix. In Nanai there is a three way past-present-future split, in Even a two-way one between past/present and future, while Evenki has a somewhat wider range of tenses.

32. The phenomenon in Tibetan may, however, reflect the reverse development, the glottal stop having developed from the 'breaking' of certain tones. The phenomenon in modern Lhasa Tibetan is at all events apparently an innovation.

33. In Kwakiutl enclitic pronominal subject and object (also instrumental) markers on the verb provide transitive paradigms, but these may be split from the verb by independent nominal constituents - the object pronominal marker is enclitic to the constituent preceding the object NP in Kwa proper, but in Heiltsuk (the northern variety) this apparently does not occur (at least resumptive subject and object pronominals are not obligatory). In Tsimshian subject and object proclitics are rather loosely associated with the verb. In Salishan transitivity as such is always indicated inflectionally, but only one lexical argument (subject or object) is typically present in a given clause.

34. A clue may be found, however, in the initial /x/ or /h/ reconstructed by some investigators (such as Menges 1968, 36) for Proto-Tungusic (reflected in Nanai initial /x/ or /h/). If this phoneme was originally pharyngeal and was lost except initially, the lost segment could represent the missing 'trigger' for dominant vowels. Initial /h/ in Nivkh could be an exact parallel (e.g. if a morpheme like allative **-tox** comes from something like ***-tuh-x**, which would also explain the velar rather than uvular final consonant perhaps).

35. Hence the tantalizing nature of the search for 'macroparameters'. The quest for such broad parameters supposedly going hand in hand with a whole host of associated harmonic features always runs the risk, however, of circularity, since idiosyncratic 'non-harmonic' features may develop out of conflicting sub-system pressures and one may end up defining the parameter and its consequences based on just those selected languages that appear to manifest it smoothly. They have, moreover, only a limited usefulness in dealing with genetic relationships between specific languages, especially where it is suspected that areal influences have disrupted the situation. More important in this context is the recognition of divergence from 'harmonic' expectations that require explanation. The best bet for such a broad parameter (apart from basic word order) is probably head as opposed to dependent marking, which rather obviously goes with complex verb morphology, but is also often accompanied by, for example, 'pronominal' agreement markers on the verb, 'free' word order, and a more highly developed derivational apparatus for verbs than for nominals. Yet none of these features is a necessary feature of strongly head-marking languages, nor are they limited to them.

36. Of these features note that (c) and (e) in particular are also frequent in Meso-America and western South America (e.g. in Quechuan).

37. There is a huge difference in type of polysynthesis hidden behind this generalization: the phenomenon in EA, however prolific, is regular and logically transparent in scope, a perfectly straightforward extension of the less synthetic Uralic type of morphology, whereas that in ND (as in Ket) is more limited but wildly irregular, disjunctive and unpredictable.

38. Of course it is not absolutely clear what is to count as an 'areal' trait, since - as can be seen on some of the maps discussed in the preceding section - their distribution can be rather patchy, with non-adjacent regions where such a trait is

preserved being separated by others where it may have been lost. The likelihood of such a distribution reflecting a unitary spread of the trait is naturally much greater if all the languages concerned are known to be related genetically and/or to have acquired the trait from some still extant common source. If this is not the case, one must always be ready to acknowledge the possibility of multiple, parallel foci. An areal trait (defined in a liberal, geographical way) may in other words have been brought into a region either by a single language (family), from which it diffused, or - fortuitously - by several different languages, reinforcing the entrenchment of the trait in the area. Whatever their genesis, areal traits once in place may not only diffuse further, but may prevent the disappearance of the trait in adjacent languages where drift would otherwise have numbered its days - its maintenance (principally through bilingualism in border areas) would help maintain ease of communication with neighbours, wherever that is valued. But nothing is guaranteed and very little predictable even statistically in language change - observe the demise of ergativity in Aleut despite the persistence of this feature in adjacent regions.

39. With some dramatic exceptions when the way ahead was suddenly open, as in the case of the Paleo-Eskimos, who followed the muskox unhindered all the way to Greenland, or the Thule Eskimos following the bowhead whale at a much later time.

40. These include the overriding of verbal number agreement by the number of the anaphoric possessor of a subject (or object) such that the verb in the equivalent of 'their father saw the boat' shows plural agreement, whereas in the equivalent of 'his friends saw the boat' it shows singular agreement. Note also the kind of indefinite construction as the following (from Bergsland 1997, 12):

kiðu-na -m a-qa -a
help-PART-REL be-PASTPART-3s
'someone helped him'

Here the participial form with **-na-** is formally both the subject of the following transitively inflected verb form and a predicative noun in its own right ('(he) helped (s.o.)'). The construction is the usual anaphoric one, corresponding historically to the Eskimo ergative one, hence the relative case on the 'subject' NP.

41. The morpheme concerned, ***næ-**, is found in Itelmen both as a 3p subject marker (corresponding to the Chukotkan inverse inflectional forms) and as a passive marker, in different paradigms. This is consistent with grammaticalization theory, which sees the unidirectional development of inflectional morphemes from derivational ones (not the reverse) as well as the retention of earlier stages of the same grammaticalization process in one language as quite normal. The same is true of the origin of the Chukotkan 'quasi-inverse' ***inæ-** from an antipassive prefix (which still exists as a derivational prefix in all CK languages).

42. This, it should be pointed out, diverges from Nichols' view of the matter, which lies close to Sapir's belief that certain kinds of typological features are particularly tenacious (in Sapir 1945, 145 he tentatively claims this for his so-

called 'conceptual (mixed- versus pure- relational) type' in particular). Nichols does require some evidence of intrinsic stability of any trait she claims to be a historical marker. The properties she requires of good historical markers include (1) that they should be persistent within any established genetic grouping concerned; (2) that they should extend back in time beyond what can be established as genetic relationship by the comparative method; (3) that they be typologically of low frquency (i.e. relatively rare), but reach a frequency peak (or peaks) in geographically distinct areas (Nichols & Peterson 1996, 359). So a single 'historical marker' on her definition may manifest itself in widely dispersed areas today. She would not consider a trivial phonological feature, for example, that just happened to diffuse rapidly, to be a historical marker of the language/family concerned.

43. This is closely related to the diachronic question as to the route(s) whereby classificatory verbs have actually arisen historically amongst the world's languages. Much more needs to be known about such less common grammaticalization processes.

4 The reconstruction of common Eskimo-Aleut and Chukotko-Kamchatkan core morphology

In this chapter the best morphological evidence to date for a genetic link between Eskimo-Aleut and Chukotko-Kamchatkan will be presented. This is somewhat more convincing than lists of individual lexical look-alikes, since the morphemes concerned constitute the core of the grammatical systems of the languages concerned and are unlikely all to have been borrowed. On the other hand, these high-frequency, functionally loaded elements appear to have undergone considerable phonetic attrition, which tends to obscure regular sound correspondences. Especially when dealing with inflectional morphemes one can expect some irregularity owing to assimilation, syncope, and other erosion processes which often go hand in hand with grammaticalization. In 6.1 I shall discuss the sound correspondences between all US languages - those that are relevant to this chapter should be clear enough, but you may wish to look ahead to Table 13.

4.1 Number, person and possessor inflections and their pronominal correlates

4.1.1. Number

Proto-EA nominals distinguished singular, dual and plural number (singular Ø or **-R/q**, dual **-ɣ/k** and plural **-t**)[1], and they could also be marked for possessor person and number. CK languages do not have the latter category. It is nevertheless possible to descry the counterpart of these EA suffixes in arguably cognate pronominal forms.

A cardinal distinction in EA nominal inflection is that between plain (unpossessed) number and possessum number when a possessor is indicated ('referential' number in Bergsland 1959, 21). The former involves the markers mentioned above, of which the plural has a direct counterpart in Proto-CK, namely **-t**. In combination with preceding possessum markers the plain ones indicate 3rd person possessor number. In Fortescue (1997a) I discuss reasons why this - the Chukchi plural but Koryak dual - should originally have been plural and not dual; suffice it to mention here that the distinction is neutralized for transitive subjects, with an original distributive affix being used in Koryak for intransitive plural subject and transitive plural object, and that plural and dual are neutralized in oblique case nominal declension, the morpheme ***-ðə-** used for both before the case markers being from original 3rd plural pronoun ***əðði** (Koryak absolutive plural marker **-w** was probably a collective originally)[2]. There is a /k/-initial dual in certain Uralic languages (Samoyedic and Ob-Ugric ***-kV**, etc.) which goes well with the EA dual, but the only trace in CK is in 1p and 2p suffixes **-mək** and **-tək** respectively, which may, as discussed in the next section, have been transferred from the otherwise lost old dual (i.e. before a new plural, based on a collective suffix, arose in Koryak).

The Proto-EA possessum number markers are singular **-(ŋ)a**, plural **-(ŋ)i** (the dual **ɣ/k** is the same as for unpossessed number, whence it presumably was transferred). All combinations of plain and possessum number are possible, e.g. 3s possessor plus singular possessum **-(ŋ)a-Ø** and plural possessum **-(ŋ)i-Ø**, as opposed

to 3p possessor plus singular possessum -(ŋ)a-t and plural possessum -(ŋ)i-t (thus Central Alaskan Yupik **cavi-a** 'his knife', **cavi-i** 'his knives', **cavi-at** 'their knife' and **cavi-it** 'their knives' from **cavik** 'knife').

As for the (unpossessed) singular, one of the most striking feature of CK noun morphology is the presence of singulative morphemes (also singulative reduplication) on many common nouns, which makes uninflected singular forms usually longer than corresponding plural ones (note that I use the term 'singulative' in a broad sense to mean any absolutive singular suffix that disappears under inflection). The Proto-CK morphemes concerned are -lŋən, -ən, and -ŋə (as in Chukchi **majo-lɣən** 'hill', **qulɣ-ən** 'skin, bark', and **qora-ŋə** 'domestic reindeer' respectively; for reduplicating singulative forms see 3.1 concerning Map 44). As mentioned in 3.1, it has been suggested that CK 'singulative' markers may reflect earlier noun classes - note that the last form given above, though not limited to animal names, has a remarkable parallel in Nivkh, where **ŋa** 'animal' is used both as a numeral classifier and as a suffix forming animal names, as also in a more limited way in Tungusic (cf. Krejnovič 1955, 142).

Proto-EA also had at least one singulative: **-na** (Aleut **-n**) on demonstrative and q-word pronominals like **u-na** 'this', which could well be compared with the second of the Proto-CK singulatives[3]. Also singular **-R/q** mentioned above functions much like a singulative on 'weak' uvular stems (but note that the strong/weak **-q** distinction may have been phonologically determined in Proto-EA, the strong ending occurring in PE principally after /ə/, which blocked the gemination under inflection that typifies weak stems). It is at all events not cognate to any of the CK ones but doubtless the same as the uvular ending of the 3s form of EA intransitive verbs.

The first of the CK forms has the clearest singulative function - it is commonly found on singular forms referring to objects that usually come in pairs (i.e. body parts like **mənɣə-lŋən** 'hand') and seems to present a link to the EA category of possessum number, otherwise lacking in CK. It could perhaps correspond to Proto-EA 3rd person singular pronoun **ə+ŋa** - or at least the singular possessum marker **-(ŋ)a** which it contains. The final **-n** of **-lŋən** is at all events a generalized 3rd person marker identical with the second singulative **-ən** and/or with the 3rd person pronominal/demonstrative stem **ən-**[4]. The corresponding Proto-EA plural possessum marker **-(ŋ)i** is not reflected in CK, although it has good candidates for a cognate in Uralic and Yukagir (see 5.1.2, also for the probable Uralic cognate of the EA singular possessum marker **-(ŋ)a**).

4.1.2. Non-3rd person

The possessor markers of EA can all be related to reconstructed pronominals, and this is the key to the comparison with CK. On Table 8 below I suggest the common source of the Proto-EA possessor markers for 1st and 2nd person (all three numbers) in pronominal forms that are also reflected in verbal subject/object inflections (as on Table 3). They can be directly compared to pronouns and person inflections in Proto-CK (independent forms, prefixes and suffixes are distinguished by appropriately placed hyphens). As worked out systematically by Bergsland for EA (Bergsland 1986, 109), the common stem appears to be a deictic ***tək-***[5], which may also be found in 4th (= reflexive 3rd) person forms, treated separately below. That the stem could be common

EA-CK was not noticed by Swadesh, who merely compared the suffixed person markers (Swadesh 1962, 1287f.). It is only in Aleut that these ancient pronominals still exist as independent pronouns: 1s **tiŋ**, 2s **txin**, etc. In verbal inflections they fuse with the preceding verb as in Eskimo, but reveal traces of an intermediate enclitic stage (see Bergsland 1986, 109). The plural CK forms could well be old duals, now plural (as suggested already by Swadesh 1962, 1284) - this is indicated on Table 8 by the vertical arrows pointing from dual to (modern) plural. Note that there are residual dual forms that are now plural also in West Greenlandic Eskimo, where the dual is otherwise lost. For some of the verbal and nominal paradigms in which the EA, CK and Yukagir affixes occur refer back to 1.3. EA languages in particular have a wide range of reflexes of these forms, some undergoing various old patterns of allomorphic variation rendered still more complex by the existence of corresponding 'relative' case (possessor) forms historically combined with a preceding **-m-**.

TABLE 8

1st/2nd person pronouns in EA and CK

Proto-?	EA	CK
1s **təkəm(a)**	**-(t)ŋa/-ka**	**kəm/-k/t-**
1d **təkəmək**	**-kuɣ/-vuɣ/-tuɣ**	**-mək** ↓
1p **təkəmət**	**-kut/-vut**	**muri/** ↓**/mət-**
2s **təkə(n)tə**	**-n/-t/-tən/-kən**	**kəðʲ**
2d **təkə(n)tək**	**-ðəɣ/-təɣ**	**-tək** ↓
2p **təkə(n)tət**	**-ði/-ci**	**turi/** ↓

The full reconstructed pronouns given can account for all the varied reflexes in both languages groups with a minimum of ad hoc pleading - for example, the three Proto-CK 1s forms, independent **kəm**, prefix **tə-** but suffix **-k** (as in Chukchi **tə-wiri-ɣ?e-k** 'I went down'; the prefix is newer than the suffix). The fact that initial ***t(ə)k-*** in CK languages regularly becomes **k-** (as in verbal stem **ku-** 'finish' from ***tku-***, the form still found in medial position) explains the independent form (with reduction of initial /k/ to /ɣ/ to produce the regular reflex in Chukotkan, namely **ɣəm**). As for the prefixed form, this probably represents a reduction to ***tə(k)m***, the second schwa being syncopated before the first since the main stress would have been on the following stem. A trace of the final consonant is found in Itelmen, where the morpheme is **t'-** before a vowel: one of the sources of ejectives there is, as we have seen, combinations of stop plus continuant (so from ***tm-***?). Also the Proto-CK plural forms **muri** and **turi**, otherwise difficult to relate to **kəm** and **kəð** respectively, are more understandable when one considers that plural **-t** takes allomorphic form **-ti** after a consonant and may further reduce to **-ði** as in the 3p pronoun **əD-ði** (perhaps from ***ən-ði** - cf. 3s **ən-**), so they may have passed via ***(kə)mði** and ***(kə)ðði** (or ***kətði**) respectively, though the relationship is somewhat idiosyncratic, with the 2p form affected in shape by the 1p one. (The corresponding affixed forms need no comment.)

The Proto-EA 1s form is similarly elucidated by the proposed pronominal

source, which explains why we have Eskimo object form -**ŋa** (and note especially Proto-Inuit 2s-1s imperative -**ŋŋa**, directly reflecting ***t(ə)ŋa**), and 1s pronoun **uvaŋa** based on it, but possessive suffix -**ka**, as in Central Alaskan Yupik **an-u-ŋa** 'I went out' but **cavi-ka** 'my knife'. Given the otherwise transparent parallel between possessed nominal and subject/object verbal inflection in EA, this is an oddity, one which has never received a satisfactory historical explanation[7]. The velar nasal must be due to the assimilation of /k/ plus /m/; there may have been additional (dissimilatory) pressure for this change from the relative case form with preceding -**m** (-**ma** < ***m** + **ŋa**). Nasality in the 1d and 1p forms may have been lost for the same reason, producing absolutive forms like -**vut/put** (Aleut -**mas**) distinct from the **m**-initial relative case form -**mta** (< ***m** + **vət** plus additional 'deictic' -**a** as in the 1s form). Compare the corresponding indicative subject/object form -**kut**, where there is no contrasting relative case form (as in CAY **an-u-kut** 'we went out' as opposed to **cavi-put** 'our knife'), and note the Inuit object form -**tiɣut** perhaps directly reflecting *-**təkut** (< ***təkəmət**). The /u/ in these Eskimo forms could be due to the preceding labial.

Proto-EA absolutive 2s form -**n** (rather than the -**t** which comparison with the Proto-CK would superficially suggest) could well indicate an original *-**nt**- (thus Bergsland 1959, 22)[8]. The relative case form is -**vət** (alternating with -**pət** after consonant), corresponding to Aleut -**mis**, from *-**m-ən**, by dissimulation. Hammerich already in 1936 proposed that the two Eskimo 2s object forms -**tən** and -**kən** both derive from a common source like ***tkən** (Hammerich 1936, 172). As regards the corresponding 2d and 2p forms, the source suggested above could further explain the odd correspondance of 2nd person singular -**n** (as in CAY **cavi-in** 'your knife') with plural -**ði**/-**ci** and dual -**ðək**/-**tək** (as in CAY **cavix-ci** and **cavix-tək** respectively), where the post-vocalic /ð/ forms could reflect */nt/[9].

4.1.3. 3rd person

Although, as we have seen, CK does not have personal possessor affixes of the EA type, it seems that there are traces of a 3rd person possessor marker remaining, of the same type as found in Yukagir before case endings (to be discussed in 5.1.2). Thus the 3rd person marker -**(ə)n** is frozen into position following the stem in the 'Class 2' noun declension for definite, individualized persons (in Chukchi mainly proper names, elder kinship terms and some other animates, including nicknames for domestic reindeer and names of animals in myths). As will be seen in the following chapter, 3rd person possessive suffixes also functioned as general markers of definiteness/specificity in Proto-Uralic.

Besides the 3rd person possessor suffixes mentioned in 4.1.1 above, Proto-EA also had 4th (reflexive 3rd) person suffixes from fused pronouns based on the same **tək**- stem. Aleut still has the independent pronominal forms 4s **txin**, etc., consisting of the 4th person possessive inflections added to this 'deictic' stem. The Proto-CK 3rd person pronominal forms were based, as we have seen, on a different stem: 3s **ən**- (absolutive form **ənno**, perhaps by combination with ***ŋut** 'here'). Note also the 3p object form -**(ə)nət** on verbs. The CK 3s form appears to be from original pronominal stem **ənæ**[10], as still reflected in the Class 2 declension oblique case forms

(locative -**ənæ(k)**, dative -**ənə(k)**). If the EA 4th person suffixes represent ancient 3rd person possessive forms lost in CK, the non-reflexive 3rd person possessive suffixes could reflect original singulative/plural possessum markers, as suggested above. In fact, as we shall see in 5.2, these may all have a common source, reflected also in Proto-Uralic.

The Proto-EA 3s pronoun **əɬŋə** is apparently based on stem **əɬ-/əl-** 'be' followed by an /l/-initial nominalizer (cf. -**ɬəq** in section 4.2), plus the 3s suffix in post-vocalic allomorphic form. Since it is still an independent pronoun in Eskimo, unlike the fused **tək-** forms, one might suppose that it represents a later creation than these. However, Aleut does have a cognate for it (alongside its **tək-** pronouns), namely in oblique forms like **ngaan** 'to/for him' (from ***əɬŋə-ni**, reflecting a syncretism of the dative and locative cases - see Bergsland 1986, 108). It could be, as suggested above, that **əɬŋə** reflects the pronominal source of the singular possessum marker (-(ŋ)**ə**) rather than the other way round (though there is no evidence of this within EA itself). It fits superficially better with the Proto-CK singulative -**lŋən** above at least. However, note that CK -**lŋən** is dominant as regards vowel harmony, which suggests - as will be elaborated later - that it has lost a final pharyngeal/uvular fricative which should show up in any EA cognate (the -**n** is secondary).

A further matter to consider here concerns the existence in Proto-EA of plain 3rd person object suffixes apparently based on the same **tək-** stem, as in Aleut 2p-3s imperative -**t-xə**, older Eastern also 3p -**t-xin**, Proto-Eskimo imperative/ interrogative/ subordinate (= relative plus contemporative) 3s object -**ɣu/-uŋ/-ku**, 3d -**kəɣ**, 3p -**k i**, with the same possessum-number suffixes as in **əɬŋə**, etc. above[11]. Compare also Proto-Eskimo **naɣu/nauŋ** 'where (is)' from **na-** 'what/where' plus the 3s pronominal form here being discussed. There was never any overlap of function with the 4th person forms (either possessive or pronominal), since these were used with coreference to the main clause subject, whereas the 3rd person object ones were only found in subordinate and other non-indicative clauses specifically indicating non-coreferentiality with the main clause subject. Given the considerable phonological irregularity of these forms (and their reflexes in older Aleut) they must be of some antiquity within EA. The Proto-EA 3rd person pronouns **əɬŋə**, etc., go at all events with 2nd person **əlpət** and 4th person **əɬmi**, etc., which take relative case possessor endings even in intransitive subject function (the 3s ones have separate absolutive/relative forms with Ø and -**n** respectively)[12]. None of these fuse with verbs as subject markers or as possessor markers in the manner of the 3rd person possessum suffixes on nouns - or, later, with the build-up of transitive paradigms based on possessed passive participles, also in the indicative mood inflection of verbs. Note that -(ŋ)**ə** does not indicate a possessive/control relationship on its own, as do the corresponding non-3rd person forms - it has its own relative case form **əɬŋən**. In such forms as ***ənlu-ŋə-t** 'their (one) house' it is the final -**t** rather that indicates the possessor.

4.2. Verbal mood and participial markers

In reconstructed Proto-Chukotkan (and as partially reconstructible also for Proto-CK) there was a basic distinction in verbal indicative paradigms between the 'aorist' in -**ɣəRæ** and the 'imperfective' (now Chukchi 'present') in -**ðkən**. This can be compared

to the Eskimo distinction between indicative **-vuq** (Inuit only, from ***-vuR** alternating with ***-puR** after a consonant) and participial **-ðuq**[13]. It is reasonable to suppose that all of these verbal mood and tense markers - with the possible exception of Proto-CK **-ɣəRæ** - were originally nominalizing participial forms (a common areal way of forming indicative verb forms in Siberia, as we have seen). Within Eskimo other participial forms took over this function as the original **-vuq** indicative grew more restricted in use. This installing of original participles as new indicatives is a process still going on in all branches of the family. CK, on the other hand, may reflect the original situation more directly. If Proto-US had an aorist of the reconstructed PU type with person markers directly added to the stem (see Janhunen 1982, 36), the CK aorist (= main narrative sequence indicative) may simply have come to include an aspectual marker as it was drawn into a tight pattern of paradigmatic oppositions involving conflated mood, aspect and tense (see Fortescue 1996). Suffix **-ɣəRæ** would thus represent an original completive morpheme persisting in the aorist and related tense/moods (though barely so as regards its form, since it finally became Ø in many combinations). The imperfective marker ***-ðkən**, may represent rather a nominalizer of the EA type, in the modern languages now functioning as a non-imperfective present tense ('Present 1') in the mood-aspect-tense paradigm system (it is still imperfective in the complex tense/moods).

There is some evidence that the Proto-EA 'participial' mood had an original imperfective sense like Proto-CK **-ðkən**. First, it has retained such a function in West Greenlandic, where the original contrast with 'perfective' indicative **-vuq** is best preserved (the distinction is still partially preserved in Canada and marginally even further west). Here the participle is used to form relative clauses (the most reduced of which corresponds to an adjective in other languages), i.e. commonly refers to states or attributes outside of the narrative flow. It is only used in main clauses in certain exclamatory or focal clause types (again outside of the narrative flow). Secondly, the unusual morphophonemic patterning of this morpheme (initial /ð/ ~ /t/) aligns it (alone of any other bound affixes) with Proto-EA continuative/ progressive derivative affix **-ðuRaR-/-tuRaR-**, in fact the two are clearly cognate (**-aR-** being a suffix of similar meaning in its own right). In North Slope Inupiaq the process of installing old participles in new indicative function has recently produced an opposition between past **-žuaq** as opposed to present **-žuq**, regularly reflecting the two morphemes in question (the former still retains a participial function). As regards the restricted use of the **-vuq** indicative that persists further west, the function is generally one of 'climactic' narrative main action (in North Slope usually in conjunction with adverbial particle **kiisaimmaa** 'finally'). It should be mentioned that a /ð/-initial participial form appears also to be ingredient in the Proto-EA interrogative and imperative moods[14].

Let me follow up for a moment the possibility mentioned above that Eskimo **-vuq** and CK **-ɣəRæ-** are related. An explanation would amongst other things have to show that these morphemes were originally participial, thus we may restrict ourselves to the 3rd person forms (this was later extended in both families by the fusion of non-3rd person pronouns). We may for the same reason ignore transitive paradigms, which can be seen to have arisen from intransitive ones in CK and from passive nominalizations in EA (see Fortescue 1997a). If the form of a common EA-CK unmarked '(past) indicative' morpheme was originally ***-ɣuR** (pl. **-ɣuRɬ** > **-ɣut**), this could have become ***-ɣəRən(æ)** in Proto-CK by addition of 3rd person marker **ən**

(from *ənæ). Note specifically the reconstructible 3p form -ɣəRæt (from *ɣəRənæt with loss of the nasal). The Chukotkan 3s aorist form has absorbed the final /n/ (thus Chukchi -ɣʔi, as opposed to 3s optative -ɣʔen), but the original shape is still more or less preserved in Itelmen (-ɣen). The /æ/ of -ɣəRæ- would thus be the result of a reanalysis, remaining when other person markers were added later. The reduction of /u/ to /ə/ in an unstressed inflection would not be remarkable (but the former could also be from the latter after /ɣ/). Moreover, if CK nominalizer -lRən (from earlier *-lRæn) goes with Eskimo nominalizers -ɬəq and -lRi(C)aq as suggested below, it would seem natural to correlate -ɣəRæn with an Eskimo *-ɣuR (from *-ɣəR?). It would at all events be more natural, areally speaking, for the tightly knit CK tense system to have grown out of existing past versus present participles (as found in neighbouring Yupik) rather than out of aspectual markers (which in neighbouring languages, including Eskimo, always stand before mood markers and subject/object inflections), especially since the participial distinction itself is lacking in CK today. However, against this hypothesis, note that -ɣəRæ- is also present in the perfective variety of the optative paradigm (where a participial morpheme would be less usual)[15].

The case of 'imperfective' -ðkən is somewhat different. Itelmen may not directly have retained the morpheme as such, but it has two 'infinitive' (participial) forms ending in -knən, the '4th infinitive' ('for V-ing') and, combined with comitative prefix k-, the '3rd infinitive', a past/passive participle which also has indicative functions (like corresponding Chukotkan ɣæ- -lin(æ), functioning as a perfect). The first part (*-kən) is probably identical with -ðkən, followed in turn by the generalized 3rd person marker -ən. That -ðkən is itself of participial origin (like Chukotkan ɣæ- -lin(æ) and imperfective - also adjectival - nə- -qin(æ)) is clear from the non-3rd person subject combinations that require linking element -i- (probably from it- 'be'), such as 2p present -ðkən-i-tək[16]. The initial /ð/ in the Proto-CK 'imperfective' (corresponding to the modern Chukchi present) is the interesting thing, especially if the -kə- is comparable to EA participial -kə- to be discussed in 5.2. Not only could this correspond to the /ð/ of Proto-EA -ðuq (*-ðuR), but also to Proto-EA -ðaR- of repeated/habitual action. There is another continuative/ progressive affix in Proto-EA, namely -uR-, and -ðuq could be a combination of a *-ðə- and this (unless the vowel and final consonant of PE -ðuq is based by analogy on that of -vuq). The EA and CK 'imperfective' participial forms are thus not identical, but may share an imperfective marker.

Another participial 'mood' marker in EA, namely Yupik -lRia(q) (Sirenikski -ləRəX), may have a direct cognate in Proto-CK -l(ə)Rən 'one who V-s' (with the same 3rd person ending -n, identical to singulative -ən). In fact the Yupik participle (now in primary indicative function in various dialects) may in turn be related to Proto-EA nominalizer -ɬəq, which forms a 'perfect' mood in Alaskan Yupik[17].

When one combines these verbal 'mood' markers with the person/number markers discussed in the previous section one arrives at intransitive verbal paradigms that can be reconstructed for the two proto-languages, Proto-CK and Proto-EA, but that cannot be assumed for any earlier common stage. Prior to that one must envisage - apart from a 'bare' aorist stem - participial forms used in indicative function for 3rd person subjects. 1st and 2nd person subjects would simply have involved the

corresponding independent pronouns, not yet fused (via an enclitic stage) as suffixes, with or without auxiliary **-i-**. The accretion of fused object pronominals (or, in the case of EA 3rd person, possessor/ posssessum portmanteau suffixes) to produce transitive paradigms in both families was a still later chapter.

4.3. Case Markers

The lack of a case marking distinction between nominative and accusative (or at least a limited use of accusative marking) is an areal trait of the non-Altaic Siberian region (including Nivkh). This cuts across the distinction between nominative-accusative and ergative languages - thus Itelmen (nominative-accusative) and Chukchi (ergative) both have an absolutive case. Two possible historical explanations suggest themselves: either an older accusative marker (e.g. ***-m**) was lost in most of the modern languages (as in some Samoyedic), or the proto-language lacked the distinction too and the accusative marker, where found, is an innovation. The latter (minority) opinion is voiced by Raun (1988, 558) as regards Uralic. In 3.2 we saw that there is good reason to believe that the ergative Chukotkan languages developed from a nominative-accusative stage still reflected in Itelmen.

As I have argued elsewhere (Fortescue 1988a), the Proto-EA case markers would appear to have more in common with Yukagir than with Proto-CK. Nevertheless, there are two ancient local case markers with traces in all these languages plus Uralic, namely locative **-k** and dative/allative **-ŋ**, of which more will be said in the following chapter.

The relative case marker for 3rd person possessor **-n** in Eskimo is also comparable to both Proto-Uralic genitive **-n** and (more indirectly) Proto-Chukotkan genitive **-in(æ)**. The original form of the CK genitive was probably just ***-n**, as still preserved in Itelmen (e.g. on 3s **ən(n)a-n**), but a new genitive (**-inæ**, corresponding to Itelmen **-ʔin/-ʔan** 'pertaining to') arose perhaps from **-i-** 'be', apparently on the basis of **-kin(æ)** 'pertaining to', which itself contains locative case **-k** plus **-i-**. However, 3s **ənæ** (as also ingredient in participial forms like **-linæ**) may rather be involved, via a reanalysis of the combination of genitive ***n** + 3s ***sä**, exactly the source proposed by Nikolaeva for Yukagir genitive **-də-** (< ***-ntə-**, as discussed in 5.1.2.). The form of the 'new' genitive on Chukotkan pronouns is at all events **-nin(æ)** on singular stems (from 3s form **ən-inæ**), **-ɣinæ** on plural ones (with /ɣ/ from locative **-k**).

On the other hand, the ordinary EA relative case marker **-m**, so central to its morphology, is not so easily relatable to anything outside of that family (at least no case marker). The presence of two different genitive/ relative markers in Proto-EA should be seen in the light of the fact that EA languages are of the double head/dependent marking type (on both verbs and nominals), whereas CK languages are - especially on nominals - of the more typically Eurasian dependent-marking type, so one does not find a separate genitive marker on the possessor (dependent) constituent and a corresponding personal possessor marker on the possessum (head) constituent as in EA. The **-n** genitive is limited in Proto-EA to contexts where a 3rd person-possessed head is itself the possessor of a further head item (or subject of a transitive verb), or where a 'relative' mood verbal form has a 3rd person subject[18], conditions not relevant for CK or Yukagir. This **-n** genitive, as mentioned, also forms the relative of 3rd person pronoun **əɬŋa** (**əɬŋan**) - compare the genitive of the 3s

pronoun in Proto-Chukotkan **əninæ**, Itelmen **ən(n)an**. So it looks as if the distribution of this case marker has become restricted in Proto-EA, and **-m** has taken over in all other situations - i.e. where accreting double dependent/head marking required a genitive/relative marker on the dependent constituent as well as a possessor marker on the head constituent. More will be said about the source of EA **-m** in 5.3.

Other CK case inflections have transparently more recent derivational origins (e.g. the Chukotkan allative **-jtə(ŋ)** from a lexical stem **jət-** 'go to/for' - the **-ŋ** may reflect the old allative)[19]. However, Bouda (1952, 43) equates the CK instrumental **-tæ** and the Proto-Uralic elative/ablative and thus it may also go with also the Yukagir and EA ablative ***-(kən)t**. The '2nd comitative' ***ka- -ma** 'with, in the presence of' (also '1st comitative' ***kæ- -tæ** '(together) with') is of particular interest in connection with Yukagir since the prefix probably comes from adverbial **kænmə** 'together', which may share a common source with Yukagir **könmə** 'friend'. On the other hand, the **n**-initial Itelmen case suffixes which Swadesh relates to EA locative **-ni** (Swadesh 1962, 1286) probably just reflect the CK Class 2 noun declension containing 3s pronoun **ən(æ)** before case endings.

4.4. Derivational affixes

Sentential negation was expressed derivationally in both Proto-EA and Proto-CK. The morpheme concerned is reconstructed for Proto-Eskimo as **-(ŋ)it-**, Proto-EA - **(ŋ)ila-** (see Fortescue et al., 1994, 419 - the /ŋ/ is epenthetic). It takes subject/object suffixes directly in the indicative, with neither participial **-ðuq** nor indicative **-vuq** (thus 3s **-(ŋ)ilaq**, 3p - **(ŋ)il(l)at**, etc., as opposed to participial **-(ŋ)itcuq**, etc.). In Aleut the cognate morpheme forms a special indicative paradigm with **-laka(X)** followed by person/number inflections (the **-ka-** is compared in Bergsland 1989, 71 to positive present marker **-ku-** and to Eskimo 'present passive' participial formant **-kə-**). The Proto-EA suffix is comparable with Proto-CK verbal prefix **æ-** (< ***æl-**?), which combines with a (participial) suffix **-kæ** on the verb and probably has the same source as negative particle **ællæ**[20].

Discontinuous marking of negation is not a particularly rare thing amongst the world's languages, of course. It could be that this morpheme represents - by procliticization of a negative verb - the earliest source of circumfixation in CK, the morphological process that was to become typical for these languages. If so, we have the seeds of this major typological 'anomaly' of CK reflected in Uralic itself, since the construction of negative verb plus deverbal suffix on the following main verb is reconstructible for PU (Janhunen 1982, 37), with a parallel also in Tungusic. From this the step to using the negative 'circumfix' on nominal expressions in the sense 'without, not having' is not great, since it is a basic feature of Uralo-Siberian languages for nominalizations to have either nominal or verbal (e.g. indicative) function. The further development to involve the opposite meaning 'with, having' would be quite natural, producing the CK comitative circumfix **ka- -ma**, which consists (as mentioned in 4.3) of a prefixed particle originally meaning 'together' (it combines with nominalizing suffix **-lRən** to mean 'have') and a suffix **-ma** which has verbal use, forming a temporal gerund, and which may be cognate with PE stative affix **-(u)ma-** (Aleut **ma-** 'do, be thus' - probably combined with stem ***əl-** > Ø 'be') and Uralic nominalizer **-mV**. I

shall return to both of these morphemes in 5.2.

Other Proto-EA derivational affixes with likely cognates in Proto-CK include **-la-** of repeated action = Proto-Chukotkan **-la-/-ca-**; in both Chukchi and Aleut with transitive verbs this indicates action on several objects (compare also Uralic iterative **-l(a)-**). Recall also **-linæ** 'having' mentioned earlier, which may go with Proto-EA **-ləkˇ** of the same meaning (also ingredient in one of the Aleut passive morphemes)[21].

There appear to be a few lexical stems in Proto-CK corresponding (like Itelmen **ənk-** above) to bound derivational affixes in Proto-EA, and these are potentially most valuable since, as mentioned, there is virtually no lexical source visible within Proto-EA itself for any of its bound affixes. A case in point is Itelmen stem **ənk-** 'catch' and EA suffix **-nəɣ-** 'get'. Another is Proto-CK auxiliary verb **ðətcə-** (> Chukchi **rətcə-**, Itelmen **it-/issi-**) 'make', which forms transitive correlates of certain analytic constructions with intransitive auxiliaries like **(t)va-** 'be'. It is tempting to correlate this with Proto-EA causative **tə(t)-** (and Uralic transitivizer **-t(a)**, Yukagir **-tə-**). Proto-CK stem **(t)va-** 'be' is perhaps itself from ***ət-** 'be (in a place)' (as in Proto-EA **ət-/əl-** and Proto-CK **it-** mentioned several times already) plus a stative element **-va-**[22]. Proto-EA **-(ŋ)u-** 'be' could on the other hand be cognate with the Chukotkan 'attributive' (or essive) case marker **-(n)u**, whose function overlaps with that of the Eskimo aequalis case.

In sum, there would appear to be a good many reasonable candidates for historically shared morphological elements (both derivational and inflectional) between the two families, although the functional and phonological details of the correspondences are not fully transparent. Let us see if the situation is somewhat more limpid when we compare Eskimo-Aleut and Uralic.

Notes to Chapter 4

1. In the comparative dictionary of Fortescue et al. (1995), final /R/ and /ɣ/ are written for Proto-EA rather than the corresponding stops /q/ and /k/, the difference being non-contrastive and indeterminate. For simplicity I generally write the stops in the present work (except in Chapter 6, where I cite forms directly from the dictionary).

2. The Itelmen plural is generally **-ʔn** ([n']), probably reflecting Class 2 plural ***-ntə** - the two declensions have collapsed in Itelmen, with also some of the oblique case endings deriving from Class 2 (locative **-enk**, pl. **-ʔnk**, and allative **-anke**, pl. **-ʔnke**).

3. But compare also Chukotkan adjectival suffix **-qinæ**, which is also used on demonstratives such as Chukchi **ŋa(a)n-qen(a)** 'that over there' (the stem **ŋa(a)n** could be cognate with Proto-EA **iŋ(a)-** 'over there').

4. That it is felt by bilingual speakers to have a similar function to Eskimo singulative **-q** can be seen from the equivalence in many shared place names on the Chukotkan coast, e.g. Chukkchi **Uelen** = Eskimo **Ualəq**.

5. This was already touched upon in Bergsland (1951, 169), referring to an idea first expressed by Uhlenbeck. Compare Proto-Eskimo deictic prefix **tað-** and Uralic **ta** 'that'.

6. Perhaps from earlier ***kət** (cf. Chukchi **ɣər/ ɣət** in Bogoras (1922) alternating with ***kən-** (the Chukotkan inflected base form is **ɣən-**, in Itelmen **kn-**). This alternation harmonizes well with the variation in EA and the proposed common proto-form ***təkəntə**.

7. In Aleut the parallel is apparent even with the 1st singular forms: **-ŋ** on nouns and **tiŋ** (enclitic) on verbs. The Yukagir 1s marker on verbs **-ŋ** suggests a parallel development.

8. Note also Eastern and Attuan Aleut plural **-n** beside Atkan **-s**, with complete syncretism of the plural and the 2s possesor marker, as also in eastern Inuit (but there as **-t**).

9. From ***tət**; note that ***tə** > **ci** before an alveolar is still an active process in Alaskan Yupik. Further evidence of the /ð/ ~ /t/ ~ word-final /n/ alternation (from */nt/) will be seen in 5.4.

10. In turn probably going with Uralic 3s pronoun ***sän**, suffixal **-nsä**, Yukagir genitive ***-ntə-**, to be discussed in 5.1.2. CK **-(ə)n** may thus ultimately be the same as the Proto-US genitive of that form.

11. There is a problem, however, with the vowel of the 3s form in Eskimo. The diverse forms here could all reflect ***təkəŋa**, as the Aleut suggests, via ***təɣəŋ-** note the old /əɣ/ ~/u/ correspondences in such PE pairs as **mətəɣ/ mətu** 'slush ice', **iməɣ-/ imu-** 'wind up', also the origin of the 1st person forms on Table 8, and even the correspondence of Eskimo contemporative marker **-lu-** with Aleut **-lix** (from ***-ləɣ**). This may have been the initial context for the fusion of the 3rd person pronoun in EA, so there may be assimilation in Eskimo with the vowel of the preceding syllable **-lu-**. Note too the complementary distribution of Eskimo 3rd person optative **-li** and 4th person contemporative **-lu-ni**: the two may ultimately be the same (the contemporative can also be used as an imperative and corresponding Aleut **-lix** may cover both funtions).

12. The non-3rd person forms are also reflected in Aleut; however, 1s pronoun **uvaŋa**, based on demonstrative stem **uv(a)-**, is an Eskimo innovation. All these independent pronominal forms retain some verb-like syntactic qualities reflecting participial origins of the type suggested. They are in fact only used for emphasis, the inflection of the head verb being sufficient for signalling the subject and/or object (or possessor if the head is a noun).

13. Yupik has **-(ɣ)uq** after the apical fricative regular dropped intervocalically, with the velar fricative showing up (as **-ɣuq**) after double vowels/diphthongs, in contrast to additive transitive indicative marker **-a-**, clearly from ***-ða-**. It has been argued in Fortescue (1981, 39) that Inuit **-vuq** could actually be from

*-**ɣuR**, which would explain the velar appearing after double vowels in Yupik (allomorph -**uq** is found sporadically through Inuit with certain affixes such as -**mi**- 'and so', which could reflect the regular loss of /ɣ/ between full vowels). Some other common PE affixes beginning with a vowel appear to have been velar-initial at an earlier stage (such as *-**aR**- of repeated action - apparently related to -**ɣaR**- of similar meaning in Inuit), the initial /ɣ/ having been lost even in Siberian Yupik, which normally retains it. If this is so, it may be possible to directly compare an EA *-**ɣuR** with CK -**ɣəRæ** (though hardly with WG i-dialect forms in -**ɣuq**/-**ŋuq**, which retain /u/, reflecting *-**vuq**). The Inuit morpheme may rather go with PU deverbal/ participial formant -**pV** however, having been replaced in Yupik, as suggested by Bergsland (1959) - see further under 5.2. It is also absent in Aleut, which on the other hand does have a probable cognate of the original participle in *-**ðuR** in the agentive nominalizer -**(X)ta-X**. This goes directly with Eskimo agentive nominalizer -**ðə** - all of these forms may ultimately go with PU nominalizer -**ntV**, as discussed in 5.4.

14. The latter attested in Aleut 2s form -**ðа**; in Inuit the interrogative has been restructured with the initial consonant of the indicative in -**vuq**, etc.

15. It is also replaced by -**la**- for plural subjects in Koryak (clearly an aspectual affix in origin), leaving the following person markers as in Chukchi. Moreoever, it is also recessive as regards vowel harmony, which goes counter to the hypothesis to be discussed later that a final EA uvular corresponds to dominant harmony in cognate CK morphemes (although after the reanalysis proposed it would no longer have been final).

16. Compare also the 3s-3s transitive form -**ðkən-i-næ** and 3rd person suffix -**linæ**, which appears to contain this -**i**- (followed by the 3rd person marker), the actual participial affix being -**l**- (cf. Proto-EA -**lək** 'one having -'). It is from this that the non-3rd person forms probably derive, with both the -**l**- and the following -**i**- dropping or absorbed before the person markers. Note that Chukotkan **ɣæ--linæ** on nominal stems means 'having/has', like the proposed EA cognate. Compare also -**qinæ** in note 3, whose **q**- also drops before other person markers.

17. Note also related Chukotkan -**cRən** 'more, most', displaying the common CK /l/ ~ /c/ alternation, and compare the same secondary meaning of EA -**ɬəq**. The voiceless /ɬ/ in the latter suffix could, by the way, be due to its most common combination, namely in *-**ətləq** with **ət**- 'be', the basic stem of the 3rd person pronominals.

18. The historical order of morphemes in the relative case 3rd person possessive inflections is possessum number + **n** + possessor number, thus 3s possessor -**(ŋ)an**, -**(ŋ)in**, -**kən** for respectively singular, plural and dual possessum, as opposed to 3p possessor -**(ŋ)ata** (< *-**(ŋ)ant(a)**) for singular possessum, etc. The non-singular possessor number suffixes (not attested in the corresponding Aleut forms) appear to have been added to the Ø-marked singular possessor ones.

19. The Nivkh vialis and instrumental at least have similar transparent origins (cf. Panfilov 1962, 142ff).

20. Evidence from Koryak suggests that the circumfix **æ- -kæ** may have been a positive participle originally acquiring a negative sense only in conjunction with a negative particle. Equally if not more likely, however, is that the negative meaning of the prefix became so bleached - it is phonologically Ø before a full vowel, note - that the addition of a negative particle became necessary. The **-kæ-** could thus be directly relatable to Proto-EA **-kə-** (and Aleut **-ka-** above). Although the sense of this morpheme in Proto-EA was exclusively passive (no longer so in Aleut), this does not rule out the possibility that it was originally passive only on transitive stems, as the Itelmen '4th infinitive' **-knen** and Chukotkan imperfective/ present **-ðkən** (note the transitive forms of the latter such as 1s-2p **tə- -ðkən-i-tək** with linking **-i-** 'be'). In fact the participial form **æ- -kæ** (**æ- -kəlin(æ)**) has itself a passive sense on transitive stems in Chukchi.

21. Perhaps also Fi **-llinen** 'one having -' - compare also Fi **-inen** 'one having characteristic of -' and CK **-inæ** 'pertaining to' mentioned in 4.3.

22. The /t/ surfaces only after a preceding vowel. ***ət-/əl-** may further be compared to Proto-EA **ətɬi-/ətɬi(C)uR-** 'do or make in a certain way', with suffix **-li-** 'become', Itelmen **le-** 'become', Yukagir **l'ə-** 'be' and Uralic **le-** 'be, become'. Compare also Nganasan continuative aspect marker **-(t)va-**. Another transitive CK auxiliary verb, **ðəntə-** 'have as, etc.', probably comes from causative prefix **ðən-** plus **it-**.

5 Drawing Uralo-Yukagir morphology into the picture

We shall now expand the picture of potential morphological correlations between Eskimo-Aleut and Chukotko-Kamchatkan by drawing upon similar areas of the morphology of Yukagir and the Uralic languages. Beneath the superficial differences in shape and the varying distributions and functions of the ancient morphological elements involved, numerous elements can be found that appear to be common to all of these branches. The indeterminate proto-language to which the reconstructions of Chapter 4 pointed can now be tentatively specified as Proto-Uralo-Siberian.

5.1. Number and person

5.1.1. Non-3rd person

Arguably cognate pronouns and their affixal reflexes in EA and CK were presented on Table 8 together with reconstructed forms in some indeterminate proto-language. In fact the corresponding Proto-Yukagir forms given on Table 9 can be directly compared (see Table 3 in Chapter 1 for the verbal endings and note that there is no dual in Yukagir):

TABLE 9

Proto-Yukagir pronouns and person markers

pronouns:	verbal suffixes:
1s **mət**	**-ŋ/-m**
2s **tət**	**-k**
1p **mit**	**-(l)i**
2p **tit**	**-t/-k/-mət**

It is possible that the various much eroded suffixed forms found on verbs (not used as possessor markers on nominals as in EA and Uralic) reflect the same reconstructed forms seen on Table 8 with an initial deictic element ***tək-**. 1s **-ŋ** and 2s **-k** are specifically used in the intransitive aorist, while 1s **-m** is a so-called interrogative (acc. Nikolaeva actually emphatic) form[1], which is also apparently present in Omok - and perhaps Old Yukagir as a whole - as a personal possession marker on nouns (see Tailleur 1959b, 95).

That Yukagir should have replaced its 1st/2nd person possessor affixes by corresponding uninflected pronouns preceding the head noun is not unprecedented within Uralic - this is what has happened in for example Estonian. CK, as we have seen, may have gone the same way. The **-ŋ** form is highly reminiscent of the EA 1s ending **-ŋa** (Aleut **-ŋ**) and may be a parallel reduction of ***-km-** by assimilation[2]. The 2s form **-k** appears also in the imperative and has been related (e.g. by Collinder 1940, 57f.) to the Uralic imperative of that form. The 1p form **-i** is often conjoined to a

preceding stem by an epenthetic /l/ (for the possible source of which see passive suffix **-(l)o(w)-** in 5.4), and 2p intransitive verbal suffix **-mət** (T **-mut**) may be transferred from the transitive paradigms with (passive participle) mood marker **-m-** (the Kolyma form is the same in the transitive and intransitive paradigms). As regards the independent pronouns, the 1s form **mət** could have been influenced by 2s **tət**. Neither Krejnovič nor Nikolaeva see the suffixed person markers as related to the independent pronouns at all, and they may indeed be separate formations from the basic Proto-UY person markers, just as in Eskimo, where the pronominal forms that were drawn into verbal paradigms are distinct from the independent pronouns (the stem is different though the person markers themselves are ultimately the same).

It would not appear on the face of it likely that the Proto-Uralic suffixed person markers are related to the reconstructed forms on Table 8. No Uralic language constructs pronouns on a deictic stem ***tək-**, although demonstrative **ta** 'that' may well be related - note especially Nenets **takï** 'that (deictic)', which could be the direct cognate. However, the old accusative forms of 1st/2nd person pronouns in Samoyedic and Ugric formed on a stem ***ki-** 'self' (originally 'image, figure, shadow') plus the personal possession suffixes are indeed parallel to the EA forms (cf. Xelimskij 1982, 93ff). Greenberg (1991, 134) cites the Hungarian forms 1s **engem(et)**, 2s **teged(et)** (with the optional accusative marker in parentheses), the second of which is especially is suggestive. Compare also the Selkup and Hungarian 1s forms in note 2 with the corresponding CK form on Table 8.

What is more apparent is that the person markers themselves, which correspond to the simple (innovative?) nominative pronouns in PU (1s **mun**, 2s **tun**, 1p **met**, 2p **tet** acc. Janhunen 1982, 30), have something in common in all the branches of Uralo-Siberian. Janhunen reconstructs for PU besides singular Ø and plural marker **-t** also dual **-k(ə)**, which may replace the plural **-t** in the pronominal forms above, exactly as in Proto-EA[3]. The corresponding possessive affixes Janhunen gives as 1s **-mə**, 2s **-tə**, 1p **-mat**, and 2p **-tat** (another marker of the dual, **-n**, was apparently used here[4]). In the genitive and oblique cases all of these were preceded by genitive **-n** (with some fusion). The vowel of the 1p and 2p forms was /ä/ with a preceding front vowel. The final /n/ on the independent singular forms (reflected as **-nä** in Finnish 1s **minä**, 2s **sinä**) may represent a PU deictic intensifier acc. Janhunen (1982, 29), although Dolgopolsky sees here a generalization of the genitive of the pronouns (Dolgopolsky 1984, 74). Recall the EA pronominal singulative **-na** discussed in 4.1.1: a common deictic source for this morpheme and the Uralic one above would be quite plausible.

The possession markers are identical with the corresponding personal endings on transitively conjugated verbs in Samoyedic and Ugric except for the 2s, for which both ***-t** and ***-n** can be reconstructed (the Proto-Samoyedic is ***-ntV** according to Mikola 1988a, 251) - both may perhaps reflect ***-nt-**, as suggested also by the EA forms discussed in Chapter 4 (compare Tables 2 and 3 for Nganasan)[5]. Janhunen (pers. comm.) sees ***-n** as the original person marker, however, and the following **-t0** as a trace of the pronoun ***tən**. The Yukagir independent plural forms could at all events go directly with these, but the singular forms may represent restructurings based on the plural forms (signalled by the vowel alone once the old plural was lost).

In fact it is possible that the Uralic (and Yukagir) independent forms could nevertheless reflect the starred proto-forms of Table 8 (with the addition of the 'deictic' **-n** in the singular). They stand - along with demonstrative stems - isolated in

Uralic as regards syllable shape (being monosyllabic), which strongly suggests contractions of one sort or another. It is precisely in such ubiquitous, high frequency morphemes that one would expect idiosyncratic phonological erosion of this sort, especially when fused with head constituents. The Uralic imperative *-**k** going with the Yukagir 2s affix (and Eskimo 2s imperative *-**ɣin** from the 2s pronoun) may be further evidence of this possibility, if it too reflects an original pronominal form. However, since it could reflect a deverbal nominalizer rather, I would not wish to push this matter too far.

5.1.2. 3rd person (plain and reflexive)

The Proto-Yukagir 3rd person pronouns (3s **tundəl**, 3p **tittəl**) are not immediately comparable with the EA and CK ones - they seem to contain genitive marker ***-nt(ə)** on demonstrative stems **tu(ŋ)** (< ***tüŋ**) 'this' (followed by the 'definite 3rd person' marker **-l(ə)**, which is dropped in the Subject Focus forms and reformulated in the plural like the other plural pronouns). Semantically, note, the Yukagir genitive is more like the CK 'possessive' morpheme than a true case marker. The isolated 3rd person possession affix of Yukagir, **-gi**, which in Kolyma at least may not be followed by case or focus suffixes, is probably unrelated to the EA markers with this function. It may have arisen through contact with Even and reflect the reflexive versus plain 3rd person affix distinction in that language: **-gi** has a reflexive sense in at least one (object focus) construction, in contrast to suppletive ***-ntə-**, which is used with following case markers and is probably identical to the genitive suffix ***-nt(ə)** mentioned above (thus K **-də-gə** 'in his -'). The latter is always non-reflexive like its EA correlate **-(ŋ)a**[6].

Since personal possessor affixes probably followed case markers in Proto-Uralic (see Raun 1988, 561, though this is still a matter under debate), their fusion as affixes from independent pronouns may have developed there independently from in Yukagir and Eskimo-Aleut, where such affixes precede case (Turkic languages do have the EA order number-possessor-case, unlike Mongolian and Tungusic number-case-possessor, but this may be coincidental). What at least is common for Uralic and EA is for number to precede possessor when there is no case marking, thus Nenets **-kəju-nʲi** 'my two -s', parallel with CAY Eskimo **-x-ka**, but this is fairly universal.

Yukagir does, however, share one important 3rd person affix on verbs with both EA and Uralic, namely **-ŋi** (in the intransitive aorist **-j-ŋi**, and - idiosyncratically preceding the transitivity marker - transitive **-ŋa** < ***-ŋam**). In EA the suffix of just this shape marks plural possessum with 3rd person possessor, or (with additional plural **-t**) 3p object in certain verbal moods, e.g. contemporative/ subordinative **-lu-ŋi-t**. In Uralic it is found as **-i-**, the Hungarian plural possessum marker, the Finnish oblique case plural, and (as **-j-**) the Samoyedic plural possessum - and non-possessed plural accusative - marker (see Bergsland 1959, 21). Yukagir plural **-ŋi**, analysed by Nikolaeva as **-ŋ-** plus epenthetic /i/, may reflect the original form as in EA. A redistribution of forms and functions of this common morpheme has occurred in at least one and perhaps all of the individual families.

Furthermore, Yukagir has traces of an earlier 3rd person marker which Nikolaeva directly relates to Proto-Uralic 3s marker **-sä/sa** (Janhunen 1982, 32), namely the **-lə** found in, for example, 3s transitive **-mə-lə** (the **-mə** is the transitivity

marker, probably of participial origin). Note that PU */s/ goes (perhaps via */θ/) to /l/ (and sometimes further to /j/ or Ø) in modern Yukagir according to Nikolaeva (1988a, 116), who cites a parallel development in Ob-Ugric. She also follows Tailleur (1959) in relating Yukagir genitive **-nt(ə)-** (**-n-** before a consonant, **-d-**/Chuvan **-nd-** before a vowel) to the genitive form of **-sä**, namely **-nsä**[7], mentioned above, alternating with the 3rd person possessive marker before case markers (Nikolaeva 1988a, 141), so the initial **-n-** is what actually goes with PU genitive **-n**. It is apparently restricted to generic or non-specific possessive relations, simple apposition of nouns being sufficient for possession by a specific possessor (as also in Even). The Proto-EA cognates of this important common morpheme could include both the 3rd and 4th (reflexive 3rd) person possessor markers (for singular possessum), respectively 3s **-(ŋ)a**, 3d **-(ŋ)ak**, 3p **-(ŋ)at**, and 4s **-ni** (from ***-nðə?**), 4d **-ðək** (after C **-tək**), and 4p **-ðəŋ** (after C **-təŋ** - older Aleut **-ðin**). It is interesting to observe (as already pointed out by Bergsland in 1959) that the EA 4p and the Samoyedic 3p forms both end unexpectedly in a nasal, perhaps reflecting the nasal (originally genitive?) coaffix ***-n** which has in some Uralic languages come to distinguish plural case-inflected forms (cf. Collinder 1960, 302). That the EA 3rd person forms could be related presupposes that the /ŋ/ - occurring originally only after vowels - is epenthetic and that Proto-US */s/ can go to zero in EA[8].

It was Bergsland (1959, 23) who first suggested that the EA 4th person forms might be related to Finnish **-nsä/nsa** 'his/their (one thing)' (also **-hän/-han** and dialectal **-nsän/-nsan**); compare also corresponding plural possessum form **-(j)ensä** (< ***-i-nsä**)/**-(j)ensa** 'his/their several things', which corresponds to EA ***-(ŋ)i-t**, with plural possessor marker **-t** following the possessum number marker. It is with these that CK 3s marker **-(ə)n** may also ultimately belong. According to Janhunen (1982, 32), the genitive form of the possessive markers with preceding **-n-** were generalized in PU to other case- and number- inflected forms, so the /n/ in the Eskimo 4s form above could also reflect such an early 'genitive/oblique' extension of the morpheme[9]. The earliest distinction within EA may have been between 'proximate' 4th person versus 'distal' 3rd person (see Fortescue 1991 for evidence of a residue of this discourse function in the distinction in WG today). This could be correlated with the genitive/non-genitive distinction displayed by the PU morpheme: a closer linkage between the former and the clause's subject would be natural. The Finnish probably directly reflects Proto-Uralic here. Most of the relevant forms contain the genitive 'coaffix' **-n-** mentioned above, including 3s **-nsä** (preceded in the case of the plural form by the plural possessum marker ***-i** - the order possessum number/possessor here is as in Proto-EA for all persons). The same element is present in 1s and 2s forms such as Finnish 1s possessive **-ni** from ***-nmi** and 2s **-s(i)** from ***-nti**, with parallels in Samoyedic. Interestingly enough, **-nsä** in Finnish has a reflexive (4th person) sense unless the genitive form of the independent 3rd person pronoun, **hänen**, is present in the phrase. Probably related according to Collinder is the Finnish 3rd person marker **-Vn** in the impersonal passive conjugation of verbs (where it is also used reflexively) and indeed the 3s pronoun **hän**[10].

According to Janhunen (1982, 32) PU 3s **-sä** had a general 'defining' function as well as its possessive one (compare Nenets **ŋəno** 'boat' with **ŋəno-da** 'his boat/ the boat'); this is close to what the 'singulative' markers of CK and EA do (it also has a parallel in Tungusic). In chapter 4 we saw that EA 3s **-(ŋ)a** may have had a

singulative function originally. So there may thus have been at least one morpheme of singulative function in Proto-US already.

The CK singulative **-lŋən** that we met in 4.1.1 looks superficially as if it could also go with Yukagir focal marker **-ləŋ**[11]. This is the Tundra form; Kolyma has **-lək**, which may contain the other focal marker **-k** attached to personal pronouns and modified NP arguments of the verb (and other 'specified' nominals), which Nikolaeva (1988a, 147f.) directly correlates with Uralic emphatic suffix/particle **-ka/-kä**. (She also suggests that the distinction of 'specified' versus 'non-specified', today purely structurally determined, reflects an earlier distinction of definiteness, parallel perhaps to the Chukotkan 'Class 1/2' distinction.) They are applied to focalized noun arguments on an ergative basis, i.e. to subjects of intransitive verbs and objects of transitive ones, irrespective of number (an optional category on Yukagir nouns), and are also used in nominal predicate sentences (as in T **tuŋ köde ieruce-ləŋ** 'that man is a hunter'). This latter fact leads Nikolaeva to analyse the focal constructions of Yukagir as historical clefts, relating the focal marker to 3s morpheme **-lə**, itself from UY (and Proto-US) ***-sä**. If this is so, CK **-lŋən** could neither go with Y **-ləŋ** nor EA 3s **-(ŋ)a** (as */s/ apparently always corresponds to Ø in CK, as in EA).

5.2. Verbal paradigms and participles

As regards the integration of these person markers into transitive verbal paradigms, even within Uralic it is uncertain whether the 'objective' paradigms found in Ugric and Samoyedic can be derived from a common Uralic source or must be regarded as secondary (Collinder 1960, 244 thinks not, but Janhunen 1982, 35 is more positive, as is Xelimskij 1982, 86f.). Certainly a complete Eskimo-type 'objective' paradigm with separate marking of both subject and object on the verbal inflection is not reconstructible - the Uralic paradigms moreover have personal possession markers directly added to the verb stem (or an aorist marker in the case of Samoyedic), whereas they are added to passive participles in Eskimo. In CK, as we have seen, transitive paradigms are also built up by accretion on ordinary intransitive verb paradigms without the involvement of a passive participle.

The parallel between EA and Yukagir is more suggestive of a common constructional source (3rd person only?), since personal possession markers are added to a participial extension of the stem to indicate the object also in Yukagir: this could in fact be evidence of the earlier presence in Yukagir of a full set of possessive markers. The nominalizing morpheme involved in the transitive Yukagir aorist, **-mə-**, has a direct cognate in Uralic (Janhunen 1982, 34), e.g. Nganasan perfect participle **-məə** (< ***-mə-jə**), Nenets **-mi**, possibly also in EA (cf. stative/ resultative affix **-(u)ma-** mentioned in the preceding chapter, and/or the Inuit transitive mood marker **-va-**). The closest parallel is in the Yukagir Object Focus construction, where the verb takes the inflection **-m(ə)lə** for 3s object, consisting of the nominalizing affix mentioned above plus 3s marker **-lə**, as in Kolyma **tudəl kudedə-m-lə** '(s.th.) killed by him' as well as 'he killed it'[12]. This is parallel to Inuit 3s/3s **-va-a**, with transitive marker **-va-** followed by 3s marker **-a**, which could, as suggested, be the direct cognate of the Yukagir morpheme here. If so, this is further support for the suggestion in Fortescue (1988: 27f.) that Yukagir once had a genitive in **-m** like Eskimo-Aleut which

reduced to zero (/m/ is not found in Yukagir in final position except when from */mV/). The usual genitive marker of personal possession and the marker of transitive subjects are both marked the same way as in EA, only by zero, as opposed to the subject of intransitive and object of transitive verbs, which may be focus-marked by **-lə(ŋ)** or **-ək**. Compare also Kolyma **tudə numö** 'his house' (< ***tuntə-m numö**?) and **tudə-l numö-gi**, both meaning 'his house', but the latter - for topicalized possessor - with the absolutive pronoun in apposition to the 3s possessor-marked head noun (the added 3rd person marker **-l** drops before other suffixes). The distribution of the focal markers and zero (from ***-m**?) is thus ergatively based, which suggests that the focus system of Yukagir could have been built up on an Eskimo-type ergative clause structure[13].

According to Nikolaeva (1988a, 149) the Object Focus construction in Yukagir can be paraphrased as follows (reflecting its origin as a possessed nominalization): 'X's killed thing is the reindeer', which became integrated with the clausal SOV pattern of the language as the verbal form took on indicative function with the possibility of an overt object appearing before it, much as I have proposed for the genesis of the Eskimo ergative clause (Fortescue 1995b). Actually, the Proto-Samoyedic objective paradigm as reconstructed by Mikola (1988, 249) also appears to have marked only 3rd person object (all numbers), indeed with the same 3s marker as Yukagir, namely ***-ta** (< ***-sä**), only directly added to the verb - after an aorist marker - without a (passive participial) transitivity marker, and in the same order vis-à-vis the subject marker, i.e. before it. This is just as in EA (as opposed to combinations with other person objects in the latter family), and unlike in the CK transitive aorist paradigm, otherwise its nearest analogue.

There are other nominalizing affixes that could be common to Uralic, Yukagir, EA and/or CK, for example the Uralic nominalizer **-k** (in Finnish an infinitive marker) going with the CK infinitive and temporal subordinate clause formant of that form. This is perhaps the same as PU participle **-k(V)**, going with PE nominalizer **-kə** 'thing being -ed' and Aleut present tense marker **-ku-X** already mentioned. It is probably also the source of PE passive participle **-kaq** (cf. the similar use of ***-k(a)** in Nenets (e.g. **xawa-xa** 'fallen'). Also comparable are the Yukagir and Uralic participle/ nominalizer **-l** and the CK and EA /l/-initial participles[14]; EA nominalizer **-nəq** (Aleut participle/ adjectival formant **-na-**) going with Nenets adjectival formant **-n'a-**, and Hungarian (and Permian) infinitive **-ni**; and the actor/agent-forming affix **-ðə /-tə** in EA, going with Uralic **-ta/-tä** of the same function. It is also possible that CK 'completive' or aorist marker **-ɣəRæ** goes with the Yukagir 'future' optative (Nikolaeva's 'adhortative') in **-ɣə** - compare especially 3s **-ɣən** corresponding to CK 3s **(nə-) -ɣəRæn**, the form reflected most directly in the (perfective) optative, in which the suffix is also used[15]. However, another candidate is the Yukagir nominalizer ***-ɣə** mentioned in 2.3, which could also go with Nganasan nominalizer of abstract quality **-gə** (also an adjectival formant), as in **heke-gə** 'heat, hot' (**hekə-** 'be hot'). In fact, if it could be shown that the **-rŋən** in CK abstract nominalizer **-ɣərŋən** 'quality of -' was once another singulative the latter suffix would also align itself here[16].

Mention should again be made of the suggestion in Bergsland (1959, 25), who pointed out the possible relationship of Inuit indicative marker **-pu(q)/-vu(q)** (lost in Yupik and Aleut) with Uralic nominalizer ***-pa**. The Inuit transitive marker **-va-/-pa-**

is probably influenced by the intransitive marker **-vu(q)/-pu(q)-** (corresponding intransitive and transitive mood markers are usually quite distinct in EA, the latter being identical with passive participial affixes), so it could be from ***-ma-** originally, i.e. cognate with the Uralic nominalizer **-mə-** (also with passive function) as suggested above. As for Eskimo participial **-ðu(R)** (going perhaps with the Chukotkan 'imperfective'), this may be compared with Yukagir 'contemporative' gerund **-də(ŋ)**, which I shall return to in 5.4.

5.3. Case markers

In Fortescue (1988) I investigated the apparently related case systems of Yukagir and EA. Adding Uralic and CK more directly into this framework supports the idea that we are dealing here with elements inherited from Proto-US, most importantly a locative/lative ***-k** and an allative/dative ***-ŋ**. Particularly striking is the exact fit between Samoyedic (Nenets) ablative **-xəd**, locative **-xəna** and Yukagir **-kə(n)t**, **-kənə**, containing lative coaffix ***-k(V)** (> T **-Rə**, K **-gə**), both with EA correlates; the coaffix is not present in either Samoyedic or Yukagir when the case markers are attached to adverbs, locational/temporal noun stems, or postpositions. Yukagir vialis ***-kən** (underlying also the ablative) goes with the Yupik ablative of that exact form (the locative I shall discuss below).

Allative ***-ŋuntə** is reconstructible for common EA and Yukagir (cf. Yupik **-vət**, Aleut **-ŋus/-ŋun**, Yukagir **-ŋ(i)n'**[17]) - compare the two dative/lative forms, **-kə** and **-ŋ**, reconstructed for PU in Janhunen (1982, 30). The former is given specifically as a prolative in Mordvin by Collinder (1960, 295). Another allative ***-ntəŋ** (as in Tundra **kej-gu-dəŋ** 'forward') is reconstructible for Yukagir, which Nikolaeva (1988a, 154) relates to PS lative ***-ntV** and Hungarian **-de** as in **i-de** 'to here' (compare Kolyma **mi-gi-də** of that meaning), but EA parallels like Aleut **wa-ŋuð-aRan** 'to here' (where the final element contains a verbal formant **aR-** 'come here') suggest that this may ultimately be the same suffix (with Y **-gu-** dissimilated from ***-ŋu-** due to the final **-ŋ**, a repetition of the basic allative marker). The ***kə** element is also ingredient in the Yukagir locative on ordinary nouns - actually in combination, according to Nikolaeva, with preceding genitive 'coaffix' **-n**[18], i.e. as **-gə-** < ***-nkə**. Compare Proto-CK locative **-k(ə)** and dative **-ŋ**, also instrumental **-tæ** going with Uralic ablative **-tə** (and with the final element in Yukagir and Proto-EA ablative ***-kət**, which is preceded by the common locative coaffix).

One or the other of these two basic markers is probably also combined with the ubiquitous Yukagir 'definite' 3rd person marker **-lə** in the instrumental suffix T **-ləк**, K **-lə** (<***-ləŋ**). Yukagir also has a comitative **-n'ə(ŋ)**, which goes with stem ***n'aɣa** 'together' and reciprocal prefix **n'ə-** and has Samoyedic cognates. Proto-Uralic locative **-nä/na** goes with EA locative **-ni** and Yukagir **-nə(ŋ)** (the final nasal may be transferred from the instrumental, comitative and/or or allative - the form used in certain lexicalizations and with demonstrative/ question words is just **-n**). Note also Yukagir equative case **-tite** (as an adverbial 'thus', ultimately from UY **ti/te** 'this'), which may go with PE equative **-tən/-tun** (WG **-tut**)[19].

The common Uralo-Siberian genitive in **-n** has been discussed earlier; in EA it

is reflected in 3rd person possessor relative case suffix ***-(ŋ)a-n** from absolutive **-(ŋ)a** plus **-n** (and compare plural absolutive **-(ŋ)a-t**, relative **-(ŋ)a-ta** < ***-(ŋ)a-n-ta** containing plural marker **-t**). Yukagir 3rd person possessive ***-ntə-** (< ***-nsä**) before case suffixes contains, as we have seen, the same genitive marker, though with the order reversed compared to EA **-(N)an** (< ***-sän**), and can indicate non-coreferentiality like the EA 3rd as opposed to 4th person[20]. This suggests a redistribution of the functions of the coaffixed form in Yukagir compared with common Uralo-Yukagir, contrasting also with the split in EA, where the position of the coaffix respectively preceding and following ***-sä** may have resulted in the 4th versus relative case 3rd person distinction that we saw in 5.1.2.

It is possible that the ultimate origin of the otherwise isolated EA genitive/relative singular case marker **-m**, on the other hand, is tied up with Proto-Uralic proximate deictic ***mV** 'this/here' as in Fi **tä-mä** 'this' (along the lines of 'this-man his-hand' - PE ***aŋutə-m aɣðaɣ-a**). It could originally have referred to definite, singular nominals only, as in many Uralic languages where it survives. Nikolaeva relates this common Uralic deictic element also to the Yukagir 'predicate focus' prefix **mə-** (pers. comm.) - compare also K **mi-gidə** 'to here', in the allative. It is, moreover, quite conceivable that the PU accusative marker **-m** also belongs here (compare Bergsland 1959, 23): its function too may have been to distinguish between subject (or topic) and object nominals when both were overt in a sentence. The debate as to the original function of Uralic **-n** (whether as genitive, lative or even adjectival marker) is still not decided today (see Raun 1988, 558 for an earlier suggestion that it may indeed have been a deictic/determining element along the lines I am proposing for EA **-m**). Significantly, it was restricted to definite singular nominals like EA relative **-m** (see Janhunen 1982, 31). In Yukagir this original **-m** may have gone to Ø - recall the loss of 1s **-m**, still attested in extinct Omok, and note the interesting 'coincidence' already mentioned that focal marker **-ləŋ** occurs only on transitive objects and intransitive subjects, i.e. the inverse of where relative/ergative occurs in EA[21]

So it is possible that Yukagir once displayed a more thorough-going ergativity than that limited at present to its focal system. When the Eskimo ergative transitive clause type developed it would have been natural for this distinguishing marker to have gone with the marked actant (the transitive subject rather than the object as in an accusative system). The relative case marker **-m** is still ingredient in the Eskimo accusative transitive clause type (again singular only, for indefinite object), in the form of the 'instrumental' case of the object (**-m-** + instrumental **-nək/-nəŋ**), as noted by Bergsland (1959, 23f.) - compare the Samoyedic 'indefinite object' construction with the accusative illustrated in sentences (d) of 1.2. The remarkable typological parallel between the use of the Uralic genitive **-n** as a coaffix before case endings on nouns and that of EA **-m** in the same position (in the locative and allative as well as the instrumental/ ablative) may be explained in terms of the specialization of ***-n** in EA to the combination of genitive case plus 3rd person possessor, with the 'new' genitive **-m** taking over several of the former morpheme's functions, a matter of combining typological continuity with morphological innovation. As argued above, ***-n** may have left its trace as a coaffix in the EA 4th person possession suffixes going with PU **-nsä**. The only likely CK cognates of this **-m** appear to be the final element in enclitic focus marker **-Ram** (also **-əm** in Chukchi, where the **Ra-** appears also in other, exclamatory expressions).

5.4. Derivational affixes

A number of derivational morphemes in EA and CK that appear to have cognates in Uralic and Yukagir have been mentioned in Chapter 4 already, including iterative **-l(a)-** and causativizer **-t(a)-** (there is also a CK denominalizer **-æt-** corresponding to PU denominalizer ***-t-** - cf. Tailleur 1959a, 413). One of these, namely the EA negative suffix **-(ŋ)ila-**, going with CK circumfix **æ- -kæ**, is of particular importance. These can be compared with Uralic negative auxiliary verb **e-** and Yukagir prefix **əl-** and with PU ***elä** 'no'; Yukagir negative particle **əl'l'e** 'no' (cf. **l'ə-** 'be') either goes directly with the latter or with related Finnish negative imperative **älä** and PC particle **ællæ** 'not'. The correlation between CK and Uralic is particularly striking here since in the latter the following verb form took a suffix ***-k** (perhaps an original present tense marker - but according to Janhunen 1982, 34 a nominalizer of incomplete action), parallel to the CK suffix **-kæ** ingredient in the circumfix. This element is probably identical to the EA nominalizer **-kə** (used as a present tense marker in Aleut) mentioned in 5.2. Thus compare Chukchi **e-wiri-ke** '(he) does not go down' with Finnish **e-i lue(')** 'he does not read' (where the apostrophe indicates a historical ***-k**, whose effect is seen in the reduction and then complete disappearance of the preceding consonant of the stem). Further specification of tense, mood and person require an inflected auxiliary verb in the Chukchi construction. According to Rédei (1988a, 68f.) the Uralic auxiliary verb is in origin a negative particle, which may have combined with a 'be' verb like FU **wole-** (Sammallahti **woli-/wali-**) to produce also a back vowel variant **a-**; he also suggests a link to PU **elä-** 'live, be'. Perhaps the original negative auxiliary could have been ***ellä-** from negative particle ***elä** plus ***elä-** 'be'. The epenthetic /ŋ/ before EA **-(ŋ)ila-** seems to indicate at all events that we are dealing here too with an earlier auxiliary negative verb parallel to the case of **-(ŋ)u-** 'be'.

The probable cognate of EA **-(ŋ)u-** 'be' in Yukagir is ***-(ŋ)o(w)-** (or ***-(ŋ)ö(w)-**) of the same meaning, also ingredient in passive affix **-(l)o(w)-** (compare Uralic passive ***-u-** or, acc. Collinder 1960, 281, ***-w-** - from ***-ow-**? - and Aleut passives **-lɣ-a-** and **-a-** from **a-** 'be')[22]. This also has an unusual (in Yukagir unique) epenthetic /ŋ/ and may also appear as an independent verb **o-**, especially among younger K speakers (Nikolaeva, pers. comm.). Both **(ŋ)o(w)-** and its EA correlate may be related to the first part of FU **wole-** above (for the second part compare ***le-** 'become'), but in some irregular fashion (cf. also proposed Altaic ***bol-** 'be'). Northern Samoyedic equivalents such as Nenets **ŋäe-** 'be' (also with prothetic nasal) are intriguingly close in form; they are from PS ***aj-** (Janhunen ***aə-j-** or ***äə-j-**), where the **-j-** may reflect PU ***le-** 'become', otherwise lost in Samoyedic (*/l/ regularly goes to /j/ syllable-finally in PS and */o/ goes to /a/ when the following vowel is preserved at least - Sammallahti 1988, 484). But as Rédei points out (1988a, 580), the loss of initial /w/ is problematical here, unless it is from ***ow-j-** via ***ow'-** or some such, with metathesis. The Yukagir form also shows variation with **öw-** according to Nikolaeva, as in particle **öwl'ə** 'no, there is not (any)', which seems to consist of the 'be' morpheme followed by negative **əl'l'ə** 'not', which might explain the umlauted form of **o(w)-** (note the parallel in Eskimo **-(ŋ)it-/-(ŋ)ila-**, which also has a privative 'be without' sense on nominal stems). Extension **-ŋola-** 'become' probably contains inchoative **-a-** following

an epenthetic /l/ (common between especially full vowels at morpheme boundary), so it is not directly comparable with **wole-** above. A better match is with Nganasan stem **ŋuolī-** 'how come/why not -' used in positive declarative sentences framed in negative form, of the type 'why shouldn't I have done it?'[23].

That Eskimo **-(ŋ)u-** (and its derivative **-ŋ(ŋ)uR-** 'become') was relatively recently also an enclitic/ auxiliary (like its Yukagir counterpart) can be seen from the fact that it is attached directly to number-marked (including singulative) personal and interrogative pronouns, as in WG **kina-a-vit** 'who are you' (from singulative **ki-na** 'who' plus **-a-** from **-u-**). In Uralic equivalents the copula is an independent verb still, as in Northern Lapp **ki leat** with loss of final /n/ and copular stem **le-** rather.

Other morphemes that could be mentioned here include EA **-lik** 'provided with, having -', going with Yukagir stem **l'ī-** 'have', derived from **l'ə-** 'be' by a transitivizer **-ī-**, and Finnish **-llinen** 'one having -', whose possible CK cognate was mentioned in 4.4 (and cf. Yukagir **-l'ə** and Votyak/Zyryan **-len** 'belonging to'). Note also FU **-ne/na-** 'would' (Finnish 'potential', Ugric 'conditional') - PE **-na-** 'would, in order to', Nganasan supine **-nakə** (with which compare the Itelmen supine in 4.4); PU **-la/lä-** 'position to the -' (as in Finnish **ete-lä** 'south') - EA **-l(l)iR** (and Yukagir **-lə** as in **pude-lə** 'outside'); Nganasan inchoative **-lə-** (Nenets **-l?-**) - PI **-liq-** 'begin to'; and PU **-nt-** 'activity of -ing' - PE **-(u)n/ -(u)tə-** 'means of -ing' (Aleut **-Vsi-X**, old Atkan **-un** - the forms with /n/ only occur word-finally). Of particular interest here is another PU **-nt-** (followed by a vowel), namely the continuative suffix of that shape reconstructed by Collinder (1960, 277): this goes well not only with the first element of Eskimo continuative **-ðu(C)aR-**/(after C) **-tu(C)aR-**, but also with the closely related 'imperfective' participle **-ðuq** discussed in 4.2 as relatable to Chukotkan imperfective **-ðkən** (recall the /ð/ ~ /t/ alternation in the EA 2nd person markers, also reflecting */nt/). Here belongs Nganasan imperfective **-t(u)-/-nt-** too (also used as a participial indicative like in Eskimo), Nenets incompletive/ future **-na-/-ta-** (Enets **-da-**), Selkup imperfective **-(n)tə-** and the Yukagir 'neutral' gerund **-də(ŋ)** (< ***-ntə(ŋ)**). Also EA 'stative' ***-ta-** (in Aleut also 'for a time, apparently') could go with Y future **-tə-**, and EA **-nəɣ-** 'get' mentioned in 4.4 could further go with Y **-n'ə-** 'have, get' (also an adjective formant), which Tailleur (1959a, 414) relates to Uralic **-ne-** 'get, become'.

The general picture that emerges, then, is one of extension of the core morphological correspondences made in Chapter 4 between EA and CK rather than of a new, distinct set of correspondences between EA and Uralo-Yukagir. If anything, the morphological parallels between EA and Uralic would appear to be closer than those between EA and CK, despite Swadesh's advice to compare the latter pair first. The extension to UY casts some light on the more problematical correspondences between EA and CK that we saw in the preceding chapter, although numerous detailed points of comparison remain to be clarified. But above all, we need to look more closely at the regular sound correspondences provided by lexical comparisons, the subject of chapter 6.

Notes to Chapter 5

1. Note also 1p interrogative/emphatic **-uok**, which Tailleur (1959a, 411) equated with PU 1p ***-mVk** (Finnish **-mme**, Mordvin **-mk**, acc. Janhunen actually ***-mat/ -mät**). In turn, these may go with CK 1p **-mək**, originally, as I have suggested, indicating the 1d rather.

2. Selkup 1s **-ŋ/k** in the subjective conjugation may represent the bare aorist marker **-ŋa-** according to Mikola (1988, 252), but it is possible that it too could go with these forms rather. Xelimskij (1982, 81f.), who also draws Hungarian subjective 1s **-k** into the picture, suggests as much, seeing here an ancient 1st person singular marker retained in these languages alongside newer **-m(V)**.

3. Note for instance Nganasan dual **-kəj** (actually the suffix of dual possession, as opposed to dual marker ***-kən'** on nouns acc. Mikola 1988, 240), contrasting with plural **-ʔ** (from ***-t**). It is possible that the Uralic dual is related to PU **käktä** 'two' (PS **kitä**) according to Hajdú (1975, 84), but an even better fit is with Yukagir **ki-(juon')** 'two': the exact equivalent of the PU and EA dual suffix on nouns is in Yukagir prefixed/incorporated form **kin-/kid-** (in the genitive case). In Yukagir plural number marking on nouns with **-pə(ŋ)** or **-pul** is optional (but may be followed by case and focus markers). The second form, used on 'schwa-stems', contains epenthetic /u/ according to Nikolaeva; she sees the **-l** as being the 3rd person 'definiteness' marker of that shape, but perhaps it reflects borrowed Tungusic plural **-l** if not the Uralic collective **-la** that has apparently replaced plural **-t** in southern Selkup. Note that the use of overt plural markers on nouns was apparently also limited in Proto-Uralic (see Raun 1988, 556).

   Plural marker **-t** in EA has gone to **-s** in Atkan Aleut but to **-n** in Eastern (and Attuan) Aleut, possibly via ***-ð** (recall that there was no distinction between final stops and final spirants in Proto-EA) - compare also Eskimo **-n-ka** 'my several -' rather than expected ***-t-ka**. This may not have anything to do with the traces of an **-n** plural/collective marker sometimes claimed for Uralic languages (cf. Sinor 1988: 731, who also links it to Tungusic), although it is certainly reminiscent of the coaffix **-n-** often found in Uralic plural inflections (and of the plural of Finnic demonstratives like **nämä** 'these' from **tämä** 'this').

4. This could perhaps reflect a form containing the ubiquitous 'coaffix' discussed below, i.e. ***-kə-n**, parallel with 3s **sän** (note, however, that the dual marker on personal pronouns is reconstructable as ***-n** as opposed to plural ***-t**).

5. Décsy (1990, 57) has independent 1s **me**, 2s **te** (but **-(n)te** as the suffixed possessive marker), 1pl **mek**, 2p **tek** (possessive **-(n)tek**), and Raun (1988, 561) has 1s **-mV** or **-me**, 2s **-tV** or **-te**, with plural forms with added **-t** (or **-k**) and dual forms with added **-n** (similarly with 3s **-sV**). With Janhunen's (and Sammallahti's) PU 2s **tun**, 1s **mun** compare for instance Selkup **tan/tat** and **man/mat** respectively. Nganasan 2s **-ŋ** is from ***-n** (<***tun**), by the way. The intransitive verbal endings reflect the personal pronouns directly (but with plain

number markers for 3rd person, as in EA and Y). The Nganasan suffixes for singular possessum/object are from 1s ***-mə**, 2s ***-tə** (via ***-rə**), 1p ***-mat**, 2p ***-tat**, etc., and for plural possessum 1s ***-j-nə**, 2s ***-j-ntə**, 1p ***-j-nat**, 2p ***-j-ntat**, etc, in other words with plural possessum marker **-j-/i-** followed by the genitive coaffixed form of the person markers (compare verbal **koða ʔa-mə** 'I killed it' vs. **koða ʔ-i-nʲe** 'I killed them'). Reconstructing the corresponding dual possessor forms is problematical - Janhunen has for example 1d for singular possessum **-majn**, for plural possessum **-najn**, but Mikola has **-min'**, etc. If Mikola is right, the plural possessum form could have consisted of that for singular possessum (***-m-in'**) following plural possessum marker **-j-**, displaying the same order of respectively possessum then possessor as for plural possessors - and as in the corresponding EA suffixes.

6. Compare Tungusic plain 3s **-n** versus reflexive **-wi/bi/mi**. It could be that Y **-gi** is rather from ***-nki**, containing genitive marker **-n** acc. Nikolaeva (1988a, 144), who sees it as relatable - either as a cognate or as a loan - to Tungusic genitive marker **-ŋī** (either singular or plural, but in Even only in headless predicative use of the type 'it is the man's', etc.), and to related general alienable possession marker **-ŋi** (the original morpheme?). The latter precedes any other suffix (including case). The Yukagir suffix is also used for either singular or plural possessor; it may however follow plural **-pə** for plural possessum (in T **-gi** may also precede the allative case affix according to Krejnovič). The following Kolyma sentences illustrates the limited reflexive use of **-gi**:

tudəl as'ə-gi kudedə-l
he reindeer-3s kill-3s.OF
'he$_i$ killed his$_i$ (own) reindeer'

Compare the following non-focused sentences, respectively with and without non-reflexive **-ntə-**:

tudəl as'ə-də-gələ kudedə-m
he reindeer-3s-ACC kill-3s/3s
'he$_i$ killed his$_j$ reindeer'
tudə as'ə-gələ kudedə-m
he.POSS reindeer-ACC kill-3s/3s
'he$_i$ killed his$_i$ (own) reindeer'

The lack of **-gi** in the second of these may be coincidental (since it can not be followed by the accusative suffix). Compare also the distinction between the two gerunds, **kudedə-də-gə** (non-coreferential, containing ***-ntə-** plus locative case) and **kudedə-l-lə** (coreferential, not containing ***-ntə**, with instrumental marker **-lə**). Both gerunds are formed on nominalized base **kudedə-l**.

7. From ***-nðä**. This is not a regular sound change within Yukagir, however */s'/ does go to /d/ after a sonorant (otherwise to T /s/, K /s'/), as in Tundra **qaldawa** 'fish skin' from **qal** plus **sawa**. Note also that the sequence */nl/ (otherwise expected in this morpheme) does not occur within morphemes; there may be dissimilation involved.

8. There are a couple of other affixes in Eskimo with epenthetic /ŋ/ appearing after a vowel (e.g. **-(ŋ)u-** 'be' discussed below). In these /ŋ/ could reflect the original singulative of that shape still found in Tundra Yukagir and the CK languages; however, in the case of EA 3s possessor **-(ŋ)a** the epenthetic /ŋ/ could have been transferred from 3p **-(ŋ)i**, where the /ŋ/ is probably original.

   For the sound change */s/ to zero compare PU **saɣe-** (Sammallahti has FP **sëxi**) 'arrive, come', EA **aɣə-** 'go over', **aɣɣiR-** 'come' (Y **eɣ-** 'go, walk'); FU **sula-** 'melt', EA **ulə-** 'flood'; FU **sekä** 'space between', EA **aku-** 'id.' and **akut-** 'mix' (note also PU **sokta-** 'stir', possibly with the same causative affix as in the Eskimo); FU **säc'e** 'sister of father or mother', PE **accak** 'paternal uncle'; and PU **sewe-** or **seɣe-** 'eat', PE **iɣə-** 'swallow' (Y **leɣ-** 'eat'). For medial */s/ there is little evidence but compare PU **kuse-** 'cough' with EA **qujəR-** 'id.'. Either Finno-Volgic **kesä** 'summer' or **keðe/kiðe** 'spring' could go with PE **kiðaɣ** 'heat, summer', though neither can be reconstructed for PU.

9. Whereas in the /ð/-initial 4th person dual and plural forms we either have the reflex of */ns/ initiating closed syllables or older variants of the plain forms - note also **-ð(u)-** in inflected forms of demonstratives such as PE **av-ðu-ma** 'that over there' (from **av-** 'over there'), which could also reflect this ***-sä**. The change */s/ to zero could have passed via /ð/, parallel to the route in Yukagir (via */ð̂/) suggested by Nikolaeva.

   The Nganasan 3rd person possessive endings on Tables 2 and 3 for singular and plural possessum/object are from ***sa** and ***-j-nsa** respectively (plural possessor ***-san**, ***-j-n-san**, probably with the coaffixed variants of **-sa/sä** seen also in Finnish **hän** and **-nsän** below). Décsy reconstructs ***-tä** rather than **-sä** for the PU morpheme, but this ignores the regular change of */s/ to /t/ (or /d/) in Samoyedic.

10. Note also Hungarian 3s imperative **-n** corresponding to Finnish **-koon** (< ***-ko-hon**). Alternates ***sän** and ***sen** both seem to be reconstructable for Proto-Uralic (with deictic extension as in personal pronouns **minä**, etc.?). Also the Samoyedic 'reflexive' paradigm contains a related 3rd person marker (Mikola 1988, 255). CK 3s marker **-n** could in theory go with Proto-Uralic **nä** 'this' and thus with the Proto-EA singulative **-na** on demonstratives (compare also PC demonstrative stem **ən-** 'this' = It **nu-**), but there would seem to be no reason why it shouldn't go directly with the PU 3s pronominal form **sän/sen** as such. PU */s/ apparently corresponds to Ø elsewhere in CK, thus FU **soŋe-** 'go in', CK **ŋæ-** 'get into boat or onto sledge' (cf. EA **iŋət-** 'sit down'), and FU **salkV-** 'stand (up)', PC **(l)qut-** 'stand up'. Note also the parallel between Yukagir 3s 'adhortative' **-ɣən** and the almost identical CK 3s (intransitive) imperative form discussed below.

11. The **-lə** element here is also used to mark the accusative on simple NPs when a 3rd person subject is present (alternating with **-ləŋ** in Tundra). K **-gələ** (T **-Rənə**), with preceding general locative marker, is used when the NP is modified or otherwise 'complex' (this includes, oddly enough, pronouns). This non-ergative system Nikolaeva regards as an innovation (pers. comm.). The **-ŋ**

in Tundra, found after most vowel stems, may be an original singulative, cognate with the CK -**ŋæ** (final /ŋ/ is regularly lost in Kolyma - except in a few noun stems like **unuŋ** 'river', where some final vowel may have been lost). This is dropped for example before focal or case markers and when the noun occurs as transitive subject in the Object Focus construction (there is also a much more restricted -**l** on certain nouns in both 'dialects' that acts similarly and could represent another historical singulative).

12. An extension to clausal usage of the same construction (with the same nominalizing morpheme) seen in Finnish **isä-n anta-ma kirja** 'a book given by the father'. In fact Samoyedic has a similar clausal construction with perfect participial -**məə-** (passive with a transitive stem), clearly different from the objective construction, as in the following Nganasan sentence:
tə̄-? **nʲini-ntə-tə** **nʲöcipti-məə-?**
reindeer-PL brother-DAT-2s unharness-PERFPART-PL
'the reindeer were unharnassed by your brother'

13. Note that the genitive as subject of non-finite clauses is common in Uralic, and the structure in Yukagir is a nominalization (as in EA); recall too that Uralo-Siberian languages are in general typified by the evolution of finite verbal paradigms from (participial) nominalizations. The marking of the subject of transitive constructions with the genitive in EA (and in Yukagir, if my hypothesis holds) was certainly an innovation, one not shared with the Samoyedic analogue - or the Chukotkan ergative clause either (a later development).

14. Note in particular the use of this formant in relative clauses, as in Kolyma **nodo kelu-l para** 'the time when the birds come' ('bird come-NOM time'). Besides Eskimo -**lRi(C)aq** and CK -**lRən** (also used in relative clauses) compare the EA 'contemporative' mood in -**lu-** and Ostyak present tense marker -**l**, also the Yukagir gerunds in -**l** in note 6.

15. Tailleur (1959a, 412) relates these further to Finnish imperative forms like **anta-ka-a** 'give!'; the final -**(V)n** of 3s -**koon** (< *-**ko-hon**) he equated with the Hungarian 3s marker as in **le-sze-n** 'he will be'. Note also the Samoyedic 1st person adhortative marker *-**ka-** (Nganasan -**ku/-gu**), and the related 'future imperative' for 2nd/3rd person subjects (Ng -**kə/kuo-**), which forms a remarkable parallel to Eskimo 'future' suffix -**ki-**, also appearing before the ordinary optative/imperative inflections.

16. There is in fact some evidence for this - compare **kaɣə-rŋən** 'hole' under *-**ɣ-** in 6.2.1 (which also has variants **karɣən** and **karɣəlɣən** in Chukchi and in Koryak means rather 'mouth of river, opening') with PC **ðeno-ɣərŋən** 'smoke hole (in yaranga)' and C **pat-ɣərɣən** 'hole' under *p- in 6.2.1. Note that these derivatives with *-**ɣərŋən** refers to concrete (resultative?) entities based on verbal stems.

17. This is the form used on 'non-specified/modified' nominals, as opposed to plain **-n'** on specified nominals (including place names). Nikolaeva sees the **-ŋ(i)-** as a 'non-specificity' marker. Perhaps the allative itself is demonstrative in origin - cf. CK **ŋut** '(this) here'. This element could have been added in Yukagir when the noun was not inherently specified itself. The 'specified' form Nikolaeva correlates with Uralic lative ***-n**.

18. As in many Uralic languages; note also Eskimo case endings on nouns like locative **-mi** from genitive (relative) **-m** plus **-ni**. Plain ***-kə** also appears as a lative in expressions like K **c'anma-q** '(falling) onto one's back'.

19. It is tempting, however, to compare the first form (found in Yupik on demonstrative stems) directly with Finnish **mi-ten** 'how', **ku-ten** 'like', etc. (compare Siberian Yupik **na-tən** 'how', likewise on an interrogative stem).

20. Compare the Uralic 3rd person variants **-nsä** but **sän** discussed above, where the genitive coaffix appears either before or after the actual person marker, parallel to the difference between the Yukagir and EA forms. This could reflect the shift in mutual ordering between possessor and case markers that has taken place within Uralic itself - note that new case markers in Balto-Finnic have arisen where case marker follows person, as in **sän** (and its EA correlate above).

21. Also the singulative **-ŋ** occurs only where Eskimo would have a zero-marked absolutive, not for example on possessor nouns.

22. But also Tungusic passive ***-v(u)-**. Note that the Kolyma form of the passive suffix is **-l̄o-** after a vowel (Tundra has **-j̄o-**), the /l/ of which is epenthetic (it is used elsewhere to separate long vowels), but could reflect the erstwhile presence of nominalizer **-l** before the 'be' element.

23. Probably different from PS **aj-** 'be' is Ng **i-** 'be (in a place/thus)', which suggests CK **it-**, EA **əl-** of the same meaning. This could represent the historical source of the 'zero' 3rd person copula constructions of both Samoyedic and CK. However, the Ng gerund **i-s'a** is also used in construction with a preceding nominative case noun (the Nenets, Enets and Selkup equivalents are suffixed to the noun, e.g. Nenets **-ŋə-**) in an essive sense ('become -') followed by a main verb meaning 'stand' or 'go', parallel to the Chukotkan construction consisting of essive case **-(n)u** plus **it-** 'be', so it could also be the direct cognate of the Chukotkan essive case marker, going in turn, as we have seen, with Eskimo **-(ŋ)u-** 'be'. Janhunen (1977, 16) related it in fact to ***aj-** (the fact that Ng **i-** corresponds to **ŋua?** < ***ŋo-** in the imperative suggests as much), but he now sees the two copular stems in PS, ***i-** and ***a-**, as distinct (pers. comm.). Perhaps they were nevertheless related as back/front vowel variants of an original 'be' verb, respectively ***e(w)-** and ***o(w)-**. The prothetic /ŋ/ of the Samoyedic back variant (now general) may have originated in connection with this particular morpheme, as in the EA and Y correlates, and spread to position before all other initial back vowels - the suffixed Nenets form **-ŋə-** mentioned above supports this.

6 Lexical correspondences between Uralo-Siberian languages

6.1. Proto-phonology

Before embarking upon the reconstruction of individual Proto-Uralo-Siberian lexical items, we need to look more closely at the question of the reconstructed phonological systems of the component families. As in all comparative work, regular sound correspondences are an essential prerequisite. The relatively simple correlation of the internally reconstructible proto-phonologies of EA and CK will be the pivot by which we shall move from the languages in the immediate vicinity of the Beringian Gateway to the broader question of the phonemic inventory of hypothetical Proto-Uralo-Siberian itself.

On Table 10 is presented the reconstructed sound system of Proto-Eskimo in Fortescue et al. (1994), extended to Proto-EA by the addition of the 't_1' versus 't_2' and 'c_1' versus 'c_2' distinctions (cf. Bergsland 1986, 70f.). The Proto-CK system below it is my own. Palatal */t'/ (Bergsland's 't_2') represents the Eskimo /t/ that goes with Aleut /c/, whereas */s'/ (Bergsland's 'c_2') represents the Eskimo /c/ which goes with Aleut /s/. Also a tentative */n'/ is reconstructed for Proto-EA, the former corresponding to Sirenikski Eskimo initial /j/, elsewhere /n/. */t'/ apparently merged with /t/ and both 'c_1' and 'c_2' correspond to /c/ in Proto-CK, but the /c/ going with 'c_2' alternates with /l/ (see **cəvi-/ləvi-**, etc., under 6.2). This alternation has been exploited semantically in the CK languages, the /c/ alternant often having an affective or repetitive sense[1] - compare the different, social function to which Old Yukagir put its reflexes of */s'/, namely /c/ in men's speech corresponding to /s/ in women's speech.

Proto-Eskimo /ɬ/ may be secondary, from /l/ next to a stop at the pre-Proto-EA level at least, so this too is put in parentheses[2]. Also two Proto-CK palatals are in parentheses since the evidence for them (mainly in Koryak and Alutor) is slender - Muravyova (1986) reconstructs them for Proto-Chukotkan, though they may have had an affective (diminutive or repetitive) function already at that stage. Muravyova also distinguishes between PC /H/ (my /R/) and /ʔ/ on the basis of Alutor, but the latter was probably just an automatic anlaut feature, as in most of the modern languages still, that has spread in Alutor to position following a schwa at least. Itelmen ejectives appear, as we saw in 2.2, to have resulted from substratum interference and not to reflect an original series. Here lies the principal difference between my own and Swadesh's reconstructed proto-system: he proposed an original ejective series, which seems unnecessary (as does Hamp's corresponding aspirated series). My own proposed common proto-phoneme system (much closer to that of proto-Uralic) is projectable from the correspondences given below the table. Remember that an apostrophe following a consonant means 'ejective' for Itelmen but elsewhere 'palatal'.

As regards the vowels, these are reconstructed as short only. The long vowels of Alutor described by Muravyova (1976, 83ff) are partly the regular result of stress on open syllables (as is also the case in Kerek according to A. Asinovsky, pers. comm.), and partly a matter of stem shape: stems of the form *(C)VCə- become (C)VVCə- (VV being a long full vowel). This is highly reminiscent of the development of long vowels in Yukagir, as described by Nikolaeva (forth.). At a still earlier stage the vowel system may have developed from a simpler one like that of Proto-EA - I shall return

to this below. No diphthongs are reconstructed, but there may have been geminate consonants, as in Proto-EA.

TABLE 10

Proto-EA and CK sound systems

PEA:							
p	t	t'	k	q		i	u
v	ð		ɣ	R			ə
m	n	(n')	ŋ				a
	c	s'					
	l (ɬ)						
		j					
PCK:							
p	t	c	k	q		i	u
v	ð		ɣ	R		e ə	o
m	n	(n')	ŋ			æ	a
	l	(l')					
w	r	j					

Correspondences are largely one to one except:

CK:	w	r	e	æ	o
EA:	v	ð / l	i	a	u

The /l/ reflex of earlier */r/ in EA would appear to occur between full vowels, the /ð/ one next to an EA /ə/[3]. Initial */w/ and */j/ (like */l/) are dropped in EA and intervocalic /ð/ and syllable-final /R/ and /ɣ/ are usually dropped in CK. Sometimes initial /p/, /t/, /q/ and /k/ correspond to Proto-CK /v/, /ð/, /R/ and /ɣ/. Moreover, CK /t/ before /i/ corresponds to /c/ in both Eskimo and Aleut (hence the lack of */ti/ in that family).

Also the reconstructed phonotactics of the common proto-language appears to be similar to that of both Proto-EA and Proto-CK, with basic (C)V(C) syllables, medial clusters of no more than two consonants (continuant + continuant, continuant + stop, stop + continuant and much less often stop + stop), and initial or final single stops or nasals only (apart from vowels). In Proto-EA at least, final consonants were indeterminate between stops and corresponding fricatives. The most notable difference here is that Proto-CK appears to have allowed single initial fricatives and laterals (also the velar nasal), impossible in Proto-EA; this is explicable in terms of the reduction of initial stops on the one hand and, on the other, the loss of initial /ə/ (as in Alaskan Yupik) - or even of whole initial syllables - in Proto-CK[4].

Compare now on Table 11 the phonemic inventory reconstructed by Nikolaeva (1992, 206-207) for Old Yukagir, slightly rearranged and with 'w' for her 'b' - a voiced spirant, as she explains. This inventory is virtually the same as for Proto-Yukagir, the time depth for this small family, consisting of two or three distinct languages, being

rather shallow. Her */ü/, note, became /u/ at an early stage, considerably disturbing the original palatal vowel harmony system that Yukagir shared with Uralic, and thus does not appear on her schema. I have removed the two spirants resulting from late assimilation of nasal plus spirant clusters, namely intervocalic */n'c'/, which has gone to /d'/ (Nikolaeva's 'ʒ'), and */nc/, which has gone to K /ž/, T /r/; compare also */nt/, which has gone to /d/, */mp/ to /b/, and */ŋk/ to /g/. Note also that the voiced fricatives */w/, */ɣ/, and */ð/ have hardened to /b/, /g/ and /d/ in Kolyma (only the last two in Tundra), but that */ɣ/ has usually been preserved as uvular fricative /R/ next to back vowels. Compared to PU, Yukagir has been generally less conservative of medial clusters. The status of /c/ (Nikolaeva's 'č') is marginal (and /c'/ may represent the same sound as Proto-EA /t'/). For the Proto-Yukagir stage she actually has /ᔑ/ and /ᔑ'/ rather than /s/ and /s'/, citing the parallel development of the latter in Ostyak, but this may just reflect variation ranging from /s/ to /š/ (and the palatalized equivalents). Note also that /l'/ and /n'/ in Yukagir may correspond to the unpalatalized segments in PU (notably when followed by a long vowel).

Below the phonemic inventory of PY I give that of Proto-Uralic as reconstructed by Rédei (1988: IXf.) - the velar spirant is Sammallahti's 'x', which he suggests may reflect either a voiced velar fricative or a laryngeal /h/ or even just a morpheme boundary phenomenon (Sammallahti 1988, 482), and may be reflected as /j/ or /w/ in FU[5]. FU long vowels arose according to Sammallahti from */Vx/ combinations (producing /Və/ combinations in PS rather). Consonant phonemes in parentheses are in Rédei but not Sammallahti. Sammallahti has a somewhat different concept of Proto-Uralic vowels from Rédei, who suggests two alternative systems (one with long /ē/ and /ō/, another with a mid /ę/). I present essentially that of Janhunen (1982), which Sammallahti also follows. He has an unrounded back high vowel /ï/ (written 'ɨ' - Janhunen's 'į'), which corresponds to a mid /ę/ or to /a/ in Rédei (as Janhunen 1982, 25 points out, the exact nature of this segment, whether high, mid or low is uncertain)[6]. I write /a/ for the 'å' in Janhunen's earlier works (the labiality of which is uncertain), and I include Janhunen's /ə/, which he has for the non-first syllable high vowel reflected as /i/ in Finno-Permic but distinct from /ï/ in Proto-Samoyedic (Sammallahti has here /ï/ vs. /i/ rather, and Rédei /e/ alone). Otherwise only /ä/ and /a/ (according to vowel harmony) could appear in non-first syllables (these are the only vowels in non-first syllables allowed by Décsy). The existence of 'schwa-stems' in Yukagir would seem to substantiate Janhunen's position.

TABLE 11

Proto-Yukagir and Proto-Uralic sound systems

PY:								
p	t	c'	k	i	ü	ï	u
	ð		ɣ		ö		o
m	n	n'	ŋ			ə	
	s (c)	s'			ä	a	
	l	l'					
w	r	j					

PU:

p	t	(c')	k		i ü	ï u
	ð	ð'		ɣ	e	o
m	n	n'	ŋ		(ə)	
	s	c s'			ä	a
	l	(l')				
w	r	j				

All these phonemic inventories clearly have a lot in common (though it should be borne in mind that Proto-Yukagir is far younger than any of the other proto-languages). Thus they all have a single voiceless stop series, a single voiced fricative and a corresponding nasal series, and all have at least traces of a palatal series by position. PU /c'/ and /s'/ are probably just variants (cf. Collinder 1960, 92 - Sammallahti has only /s'/), with traces of this variation variously reflected in some of the daughter languges still today, as I have mentioned. The distinction became phonemicized in FU (at which stage also an /š/ appeared). The principal dimension of difference between Tables 10 and 11 lies in the uvular series of Table 10. It should be recalled, however, that modern Yukagir does indeed have such a series: the question is whether its genesis from velars in the context of back vowels is parallel with the relationship of EA and CK uvulars and Uralic velars. Also the correlation amongst the vowels of the two tables needs further comment.

Both these important issues are tied up with the question of the origin of vowel harmony in all of the major branches except for EA. As we have seen in Chapter 3, palatal harmony is found widely throughout all branches of the Uralic family except for Samoyedic, where it has been largely lost owing to complex phonological developments. Its simple form (as better preserved in the parallel phenomenon in Altaic) was to become disturbed by various local developments such as a partial merger of */i/ and */ï/ in Finno-Ugric. Labial harmony is more sporadic and doubtless secondary. The eastern language groups - CK and EA - could, like Yukagir, have lost an originally productive system owing to vowel shifts, but EA and probably CK too are more likely to reflect a pre-vowel-harmony stage (as in Proto-US itself?), in which case the vowels of non-first syllables in Proto-EA should prove valuable in reconstructing common forms and help solve some of the difficulties still attendant upon reconstructing these in PU (and relating them to Yukagir).

All the eastern languages retain clear traces of the distinction between front and back allophones of velars in the context of respectively front and back vowels - in the latter case eventually resulting, as the languages concerned moved closer to the Gateway area, in phonemic uvulars. Such a supposition is borne out by many plausible cognates involving these sounds, some of which will be presented in the following sections. In EA and CK, however, this would have been a matter of local adjacency within individual syllables, not directly linked to vowel harmony as such. Thus Eskimo languages have many stems and affixes containing both velars and uvulars (as well as front and back vowels); where we find a uvular adjacent to an /i/ or a velar adjacent to an /a/ or /u/ today one suspects an earlier back or front vowel (respectively) that has since merged with its opposite counterpart. In CK there are numerous examples of velars and uvulars in the same stem but this is not as common as in EA in simple word-forms. In Yukagir it is not the case at all since it is only fairly recently - mainly

through the defronting of */ü/ to /u/, which still acts as a front vowel in this respect - that palatal vowel harmony has been disturbed: here a given word may have either velar or uvular consonants but not both. It is this regularity that allows Nikolaeva to propose one velar series alone for Proto-Yukagir.

In pre-Proto-UY, then, (i.e. before Yukagir 'split off' from Uralic), progressive palatal vowel harmony must have spread until it had obscured all vowels other than those of the first syllable (which determine those that can follow). The alternative hypothesis, that EA once may have had such harmony, which since became lost owing to reductions in its vowel system, founders on the fact mentioned above: velars and uvulars may occur in one and the same word (for example **qikiRtaq** 'island'). What appears to have happened in EA is that a velar consonant before an original back vowel (possibly shifted since) has gone to a uvular (as in CK), and that a syllable-final velar fricative after a schwa has gone to a uvular if the first vowel of the stem is of back quality; this latter process may have originated in sporadic assimilation-at-a-distance, since there is a certain amount of variation here.

The unusual dominant/recessive (or 'compact') kind of vowel harmony found in Chukotko-Kamchatkan appears to be a more local development. As mentioned in 3.1, it is reminiscent in its essentials of the system of 'root retraction' best evidenced in certain West African and Salishan languages and also typical of modern Even and other Tungusic languages (it is reconstructible for Proto-Tungusic), but with the important addition that any dominant morpheme in a word determines the vowels of the whole, so that affixes and not just first syllables of stems (as in Tungusic) can determine the word's harmony[7]. The 'dominant' vowels of Chukchi, /a/, /o/ and /e/, much as in Proto-Chukotkan, remain constant, whereas the corresponding 'recessive' ones, /æ/ (now fallen together with /e/ in Chukchi), /u/ and /i/ are replaced by their dominant correlate if there is any dominant vowel in the word (schwa is outside of the system).

Now it has been noted that such systems, involving a relationship of lowering and retraction between the two series of vowels, generally involve pharyngealization in the case of the dominant series (cf. Bessell 1962, 167ff, who discusses the similar kind of vowel harmony - progressive and regressive - in Interior Salishan languages). So it is possible that the dominant vowels of CK reflect pharyngealization owing to a since lost pharyngeal/uvular */R/. This is apparently also the case in Coeur d'Alene, for example, although in other Salishan languages the pharyngeal or uvular segments remain overt and may be reconstructed for the proto-language[8]. If so, this missing pharyngeal/uvular would have to have been stem-final in CK, since both /q/ and /R/ occur word-internally with both dominant and recessive morphemes and it is virtually only in non-final position that reflexes of /R/ are found today: the relatively rare instances of nouns ending in /q/ all seem to have lost a following vowel, and the one remaining common Chukotkan word ending in a pharyngeal/uvular fricative (in Koryak, but no longer in Chukchi) is high-frequency ***əllaR** 'mother' - which is dominant as expected. Thus compare for example Chukchi **majo-lɣən** 'hill', Eskimo **majuR-** 'go up'; Chukchi **top-** 'cover', Eskimo **tupəq** 'tent'; Chukchi **j'o-** 'reach' (<***joR(ə)-**), Eskimo **uR-niɣ-** 'go towards, reach'; and Chukchi **kaŋo-lɣən** 'kind of seagull', Eskimo **kaŋuq** 'snow goose' given under the lexical correspondences in 6.2. This reflects the Eskimo distinction (as regards nouns) between 'strong' and 'weak' uvular stems (the former with original final uvular, the latter actually vowel stems with

added 'singulative' -**q/R**). Muravyova (1979, 58) suggests in fact that the CK 6-vowel system developed out of an earlier 3-vowel one /i/-/u/-/æ/ as in Eskimo (but it is by no means certain that every CK /a/ developed out of an */æ/, for example).

A precondition for - or implicational universal of -pharyngeal consonants is, according to Sherzer (1976, 63), the presence of multiple back consonant positions (i.e. velar vs. uvular at least). In Wakashan, indeed, pharyngeals clearly derive from uvulars (Bessell 1992, 240). So 'root retraction' harmony of this type is unlikely to have developed in CK before the uvular/velar distinction was phonemicized[9]. An alternative hypothesis, that the CK system could have emerged from a palatal harmony system like that of Proto-Uralic via the development of */ü/ into /u/ and of */u/ into /o/, exactly as supposed by Nikolaeva for Yukagir (Nikolaeva 1992, 207), followed by further complex vowel shifts, presupposes an ad hoc mechanism that still does not explain the sizeable residue of cases where CK words may contain both velar and uvular consonants at the same time. Whether the distinction between dominant and recessive vowels arose at a time when the proto-language only had three full vowels as in Eskimo, or whether there were more that later merged, is difficult to determine, but note that dominant /e/ and /o/ are relatively rare, whereas /a/ is extremely common[10].

The simplest phonemic inventory for Proto-Uralo-Siberian commensurate with the individual proto-systems on Tables 10 and 11 would appear to be that on Table 12:

TABLE 12

Proto-Uralo-Siberian phonemes

p	t	t'	k	i (ü) (ï) i
v	ð	ð'	ɣ	e ə o
m	n	n'	ŋ	ä a
	s c	s'		
	l	(l')		
w	r	j		

Phonemes in parentheses are uncertain and may be secondary. There may have been geminate consonants in this original system (they are reconstructible for EA, FU and perhaps also CK and Proto-Yukagir), although Sammallahti has no reconstructed geminates for PU except ***ïppï*** 'father-in-law'[11]. There were no long vowels. To get from this system to Proto-Uralic one needs simply a merger of */v/ and */w/ (the former, like /r/ and /ɣ/ would only have appeared intervocalically), also in Proto-Yukagir, which apparently further merged */ð'/ with */l'/ and developed (like Samoyedic) a secondary /ö/ (e.g. from */o/ before certain consonant clusters - cf. Nikolaeva 1988a, 136)[12].

To get to Proto-CK, one must envisage (apart from the development of the uvulars discussed above) a merger of */t'/, */s'/ and /c/ and the loss of */s/, also the merger of */ð'/ with */l'/ (though this is poorly attested) and perhaps of */ï/ with /ə/ (or */a/) and of */ü/ with */u/, if these sounds were really Proto-US at all (the question of the vowel inventory will be returned to shortly). In the case of Proto-EA, */s/ has

also been lost and */ð'/ (which could occur initially in PU and probably Proto-US) merged with */l/ and probably also */l'/, dropping initially (whereas /ɬ/ is secondary). As regards the EA vowels, these presuppose mergers of */i/ and */e/, of */o/ and */u/ (and */ü/ ?), and of */ä/ and */a/ (and if */ï/ existed it would have gone to */a/). After /s'/ EA appears to have /i/ corresponding to any original full vowel (Yukagir has /ö/ from */a/ in this position before an alveolar/palatal sonorant).

The correspondences among single consonant and vowel segments in the various languages deriving from Proto-US appear to be as on Table 13 (in Fortescue 1994b EA 't_2' was erroneously related to PU */s/). Aleut, Itelmen and Yukagir refer to their respective proto-languages. The vowel correspondences have been simplified by the removal of Itelmen and Aleut, where correspondences are rather irregular and/or complex[13] (FV = front vowel, BV = back vowel). Examples of all of the sound correspondences on this table will be met in 6.2.

TABLE 13

Sound correspondences

Consonants

US	PU	FU	PS	Y	CK
*p	p	p	p (Ng f/h/-b-)	p/-w-	p
*t	t	t (Fi s _i)	t (Ng t/-d-/-ʔ)	t/-ð-	t
*t'	c	c (Fi h-/-t-)	c[1] (Ng t)	c' (K -s'-)	t k (_FV)
*k	k	k	k[2] (Ng s _FV)	k/-ɣ-[3]	 q (_BV)
*-v-	w	w (Fi v)	w/-Ø-	w	v
*-ð-	ð	ð (Fi t/d)	r	ð (>r)	ð/Ø-
*ð'	ð'	ð' (Fi t/d)	j	ð/l'	(l') ɣ/-Ø (_FV)
*-ɣ-	ɣ	j/w/long V	ə/-Ø-	ɣ/w[3]	 R/-Ø (_BV)
*m	m	m	m	m (& -w-)	m
*n	n	n	n (& Ng -ŋ)	n/n'	n
*n'	n'	n' (Fi n)	n'	n/n'	(j)[4]
*-ŋ-	ŋ	ŋ (Fi Ø/v)	ŋ/Ø	ŋ	ŋ
*s	s	s[5]	t	l-/j-/Ø	Ø
*s'	s'/c'	s'/c' (Fi s)	s	s'/c'[6]	c/l
*c	c	c (Fi h-/t-)	c[1] (Ng t)	c'/-c-	c
*ɬ	l	l'[7]	l/j-/-j	l/l'	l
*l'	(l')	l' (Fi l)	(l)	l/l'	(l')
*-r-	r	r	r	r	r
*w	w	w(Fi v/Ø _o)	w/-Ø(Ng b-)[8]	w (K Ø-)	w
*j	j	j (Fi j/Ø _i)	j/-Ø	j	j

(TABLE 13 cont.)

US	PC	I	EA	PE	A
*p	p/v	p (f _C)	p	p	h/-hm-
*t	t/ð (C t/r)	t (s/ɬ _C)	t (c _i)	t (c _i)	t (-s- _ə)
*t'	t/ð (C t/r)	t (s/ɬ _C)	t'	t	c
*k	k/ɣ	k	k (_FV)	k	k
	q/R (C q/ʔ)	q	q (_BV)	q	q
*-v-	v (C w)	f-/v/Ø	v	v	m[9]
*-ð-	ð (C r)/-Ø-	Ø(t _C)	ð	ð (WG š/Ø)[10]	ð
*ð'	(l)	(l')	(ð/l')	ð/l/Ø-	ð/l/Ø-
*-ɣ-	ɣ/-Ø	x/f/Ø	ɣ (_FV)	ɣ[11]	ɣ
	R(C ʔ)/-Ø-	X/Ø	R (_BV)	R	R[12]
*m	m	m[13]	m (& -v-)	m (& -v-)[14]	h-/-m-
*n	n	n[13]	n	n[14]	t-/-n-
*n'	j	(j)	n'	(n')[15]	(t-/-n-)
*-ŋ-	ŋ	ŋ	ŋ	ŋ[16]	ŋ
*s	Ø	Ø	Ø	Ø	Ø
*s'	c/l	l	s'	c (WG s)	s
*c	c	c	c	c (WG s)	c
*l	l	l/ɬ/ʔ[17]	-l-/Ø-[18]	-l-/Ø-	-l-/Ø-
*l'	(l)	(l')	(-l'-/Ø)	(-l-/Ø-)	(-l-/Ø)
*-r-	r	s-/z	l (ð _ə)	l/ð (WG š)	l/ð
*w	w	f-/v/Ø	-v-/Ø-	-v-/Ø-	-m-/Ø-
*j	j	j/z/s-	-j-/Ø-	-j-/Ø-	-j-/Ø-

Vowels

US	PU	PS	Y	CK	EA
*a	a/ï	a/ë	a/e/ï	æ~a	a
*ä	ä	e	e/a		a
*e	e	i	e	i~e	i
*i	ï	i/ə	i		i
*o	o	o/a	o (<*u)	u~o	u
*u	u/ü	u/i/ə	(<*ü)		u
*(ə)[19]	(-ə/-ï)	-ə	-ə	ə	ə

1) into t except in Selkup
2) and Nen -x-, Ng -g-; Selkup q _BV
3) k into modern q/-R- and ɣ into R _BV
4) PC n' in Muravyova probably affective variant of n (like l' from l)
5) Ugric ʊ̈ (Ostyak ɬ); also š (Fi h)
6) into T s, K š
7) FP also r
8) and may form diphthongs; into k/q in Selkup
9) uv- to w-
10) Sir tˢ/r, Yupik and most Inu j/Ø
11) often to -Ø- in Inu and AY
12) often to Ø syllable-finally
13) m- & n- > Eastern b-, d-
14) WG -p (also -n and -ŋ to -t, -k)
15) Sir j-, elsewhere n
16) iŋ- to j- in most Yupik
17) Southern n-, Eastern d-
18) ɬ secondary (from stop plus l)
19) non-first syllable, but in CK & EA ə may also correspond to a US full V

The vowel correspondences between all branches are no doubt more complex than the above suggests, however. The main regular correspondences, as on Table 13, will be found illustrated in 6.2. It is assumed that /ü/ and /ï/ are secondary in Uralic (especially the first is rare in potential Proto-US cognates) and that the full vowels of CK already formed allophonic harmony couples (as suggested above). Rédei too doubts the originality of /ü/ in Uralic (Rédei 1988a, X) - certainly this is a vowel which is often associated (like illabial /ï/) with vowel harmony systems (or regular umlaut), and this does not seem to be reconstructible for the Proto-US stage. Sammallahti has only one PU stem with /ü/ in the first syllable not followed by /i/ in the second (**ðʼümä** 'glue' - PS **jimä**, with no Ugric equivalent; Rédei has **ðimä/ðümä** rather).

As for /ï/, the situation is more uncertain. The cases where Proto-US appears to have /a/ and PU /ï/ could be due to early dissimilation from a following syllable /a/ (i.e. /å/) in the latter - it is unlikely to be coincidental that Sammallahti has no /a/-initial stems reconstructed for PU at all and that none of the innovatory stems in FU with initial /i/ (from */ï/?) followed by /a/ in the second syllable (breaking vowel harmony) have Samoyedic cognates and thus cannot be reconstructed for PU. The words reflecting */a/ that vary with */ï/ in a number of instances have good potential Altaic cognates with /a/ (this is true of the **ap(p)a** and **al(a)** sets in 6.2.5 - also **an'a**, if PU ***ïna** goes with it). In the first case there could be sporadic dissimilation of the first (labial) vowel before a /p/ (eventually affecting also the second syllable). As Janhunen hints, the variation in the phonetic reality of */ï/ may also reflect dialect differences (Janhunen 1982, 25)[14]. The matter would seem to be tied up with the emergence of /ï/ or /ə/ in second syllables (the back vowel correlate of /i/) as palatal harmony developed - Proto-UY may well have contained both sounds as distinct phonemes.

As regards the early merger of the CK vowel system, the principal evidence is in cases where PU has /o/ or /e/ and both CK and EA have /u/ or /i/ respectively. There are unfortunately few of these (since CK often has /ə/ or else dominant harmony obscuring the picture), but note the **teŋ(ä)-**, **pejə(ɣ)-/pojə(ɣ)-**, and **el(ä)-** sets under 6.2.5 (EA has a schwa in some of these however), also CK essive **-(n)u-** which probably goes with EA **-(ŋ)u-** 'be' (Proto-US ***(ŋ)o(w)-**).

The status of /ə/ and its correlations between the various languages is particularly complex and may reflect different histories of stress assignment in the various branches

(especially complex in CK). Schwa has probably arisen from the reduction of full vowels in both EA and CK, not being restricted to non-first syllables as in Proto-UY[15]. Within EA alone there are complex correlations for PE /ə/ in Aleut (where it may correspond to /a/, /i/, /Ø/, or even /u/, with syncope and assimilation-at-a-distance involved). A hypothetical Proto-US */ə/ not restricted in its distribution might in fact help elucidate some of the less regular PU to Yukagir vowel correspondences (e.g. PU /ï/ to Y /a/). There is at all events no reason to believe that exactly the same restrictions on second syllable vowels applied in the hypothetical Proto-Uralo-Siberian language as in the Uralic and Yukagir branches.

6.2. Specific cognate sets

6.2.1. Eskimo-Aleut and Chukotko-Kamchatkan

Below I give some of the best candidates for lexical cognates between the two families, without detailed commentary. All items are arranged according to initial or medial proto-phoneme and are regularly reconstructible for the proto-languages concerned (they occur in more than one language in each family) and are therefore unlikely to be loans. The Proto-C(K) forms are Proto-Chukotkan and the Proto-E(A) ones Proto-Eskimo unless otherwise indicated. I have not included Itelmen forms that are likely to be loans from Chukotkan. Bear in mind that many E(A) forms ending in /(V)R/ contain derivational suffixes (e.g. **tamuR-** 'chew', which may contain the suffix **-uR-** of repeated/protracted action) - it is the bare stem that should be compared with the corresponding C(K) forms (some of which are recessive as regards harmony). In other cases stem-final /ɣ/ varies with /R/ within EA. I have left Proto-Eskimo word-final /R/ and /ɣ/ as in Fortescue et al. (1994); elsewhere in this book, as explained earlier, I have replaced them by non-contrastive /q/ and /k/, which is in fact the convention for Proto-Inuit in the comparative dictionary. I represent the Proto-CK vowels as on Table 10, although, as discussed in 6.1, these may have developed out of a simpler Eskimo-like system at some common proto-stage.

Abbreviations: PI = Proto-Inuit, PY = Proto-Yupik, C = Chukchi, K = Koryak, CAY = Central Alaskan Yupik, SY = Naukanski Siberian Yupik, WG = West Greenlandic, Sir = Sirenikski, A = Aleut (Atkan unless marked E for eastern), I = (Western) Itelmen, E = Eastern Kamchadal and S = Southern Kamchadal (the two latter left in non-phonemic form from early sources).

Proto-C(K)	*Proto-E(A)*
*p-, -p-	
pəɣ-at-, I **pvat-** 'float' (& **pəɣpəɣ**, I **poxpox**, E **poxc** 'inflated seal-skin float' & E **pxak** 'fisherman')	**puɣə-** 'float', CSY **puɣ-naan** 'inflated poke, float' (& PI **pu(ɣ)uq** 'bag, poke', A **hux** 'bag', E A also 'seine net')[16]
I **pəla(pəl)** 'leaf'	**pəɬu** 'leaf' (<***pəlalu(ɣ)**?)
C **pat-ɣərɣən** 'hole'	**pətə-** 'penetrate' (PI **pəttaq** 'hole')
æpæ 'grandfather' (S I **apa-c**, E **epep** 'father')	**ap(p)a** 'grandfather'
pako- 'flick, knock against'	PI **pakak-** 'knock into'

pujæ- K 'cook on hot stones in pit' (Radl. has 'steam', 'smoke' as verb for I), C **puj ʔepuj** 'soot'	**pujuR** 'smoke', A **hujuX** 'smoke, steam'
vət- 'tie up' (I **pəz-**)	**pətuɣ-** 'tie up'
piŋku- 'jump'	**pəkə-** 'jump up', A **hiki-** 'disappear'
vak(əRo)- 'sit'	**pakəɣ-** 'bend, flex'
væɣəlku- 'scratch' (**væɣ-** 'claw')	**pakiɣ-** 'hook fingers into, dig into'
pəl- 'scrape skin' (older I **ples-** 'scrape' (<*pəlaɣ-t-?)	**pəlaɣ-** 'flense'
*k-, -k-	
kukæ- 'cook' (I **koke-**)	**kukəɣ-** 'light fire'
I **k'ufk'uf** 'fingernail' (Radl. **kuxkux**, E **kuuc** - also 'claw'; <*kəkuɣ?)	**kukiɣ** 'fingernail, claw'
kærji 'stomach'	**kaŋi-R** 'innermost part' (with 'weak' /R/), E A **kaŋ-in** *'interior, essence'*
kæmlil 'circle', I **kmecem** 'ring'	**kamlu** 'round cap' (WG 'mounting on tip of paddle')
I **koma-** 'dress, put shoes on' (<*kame-; E **kemgaz**, S **kinkumag** boots')	**kaməɣ** 'boot' (verbal 'put on 'footware')
katɣa 'adze' (I *kast)	PI **katuk-** 'beat drum' (PE **kaðuɣ-** 'strike with object'), E A **kataɣ-** 'beat'
kæw(ji)- 'rise' (and C **kæwkæw** 'hill')	**kəvəɣ-** 'raise' (A **kumsa-**)
mæ-ki 'who' (I **k'e**; cf. **mæŋ-in** 'what kind')	**ki-na** 'who' (A **kiin**)
kæli- 'draw (line)' (I **kele-** 'write')	**kaləɣ-** 'graze, brush against'
I **kiv** 'river' (E and older W **kiɣ**)	**kuðəɣ** 'river' (and **kuvə-**, A **kum-** 'pour')
*q-, -q-	
qulɣən '(fish) skin, bark' (I **qulxi-**)	**qulə-** 'above', A **qul-** 'for sake of, because of'
qiŋ- '(animal) nose, beak' (I **qeqeŋ**)[17]	**qəŋaR** 'nose'
quq- 'call'	**ququR-** 'call'
I **qɬXal** 'day'	**qilaɣ** 'sky', A **qila-** 'morning'
qitə- 'freeze' (<*qəRit-?)	**qiRə-** 'freeze'
quli- 'cry, shout'	**quliRaR-** 'tell about s.th.'
I **qesX** 'mouth' (E **kissa**, S **kesx** 'lips')	PY **qisiq** 'lip'
*t-, -t-	
til(til) 'wing', I **telxp** 'wing feather' (S **titil** 'wing')	**culuɣ**, CSY **siluk** 'wing feather'[18], PY **ciluR-** 'soar'
təmlu- 'lick' (I **təʔm(e)-**)	**tamuR-** 'chew', A **taamu-** 'lick'
tæɣjiŋ- 'cough'	**taɣi(C)uR-** 'sneeze'
tiŋu- 'pull'	PI **ciŋuk-** 'strain', PY **cuŋaR-** 'become red from straining'

ðiŋæ-, I **seŋ-** 'fly up' (<*tiŋæ-?)	**təŋə-** 'fly up'
*t'-	
tu-lRæt- 'steal'	**təɣləɣ-** 'steal' (A **cxa-**)
E I **teno-** 'shoulder'	**tunu** 'back', A **cunu-X** 'back of neck'
*-ɣ-	
təɣiŋrə- 'pull out', I **txoŋ(e)-** 'pull'	**təɣu-** 'take' (A **su-**)
kaɣə-rŋən 'hole, opening'	**kaɣu-** 'reach in under', A **kaxu-** 'dig a pit'
jəɣu- 'bite'	**əɣu(t)-** 'pierce, sting', A **ɣu-** 'penetrate'
*-R-	
jəRilɣən 'moon'	PY **iRaluq** 'moon'
cimɣəRu- 'think'	PY **cumə**R- 'think' (PE **cumiɣ-** 'be anxious')
*-ð-	
qəv-/quv- 'narrow, tight'	**quðu-** 'close in', A **quðu-** 'valley, cleft'
I **xka-** 'hot' (S **kika**, E **kekak** 'heat')	**kiðaɣ-** 'hot, heat'
ləqlu 'milt' (I **lqilqi-m**, S **nukuel**, E **deked**)[19]	**əRði** 'milt sac' (<*ðʾəqðʾi?)
*-r-	
kawra- 'go round'	**kaðəvə(t)-** 'go round' (< ***kavðə-**?)
ðəra- 'cut up' (<***təra-**?)	PI **təža-** 'slice for drying'
-ro- 'interior sleeping compartment of yaranga'[20]	**ilu-**, A **il-** 'inside'
*m-, -m-	
məlɣə 'turf'	**mələɣ-/məlu-** 'cover or plug'
majo-lɣən 'low hill'	**majuR-** 'go up' (A **hajuR-**)
kamak 'evil spirit'	**kama-** 'be nervously attentive' (WG **kamaɣ-** 'be angry')
kəmRə(kəm) 'worm, caterpillar'	**kumaɣ** 'louse'
məɣu- 'nomadize' (& K **məɣu-jil** 'reindeer caravan')	PY **məɣə-/muɣu-** 'go off far' (Sir **muɣulʔij** 'caravan')
*n-, -n-	
nutæ- 'land', I **nute-n** 'clearing' (with dissim.?)	**nuna** 'land' (A **tana-X**)
tənup 'hill' (and C **tənot-ɣərɣən** 'swelling')	**tənu-** 'push' (and WG **tinu(pa)-** 'swell (like a boil)'; A **hnu-** 'reach')
I **kank-** 'spend winter (E **kankaz** 'winter')	**kanəR** 'frost'
ŋæv (<***nəŋæv**?) 'woman', I **mim-sx**, older **ŋim-sx** 'woman', **ŋi-c** 'wife'	**nəŋjuR** 'oldest woman in household'

anəŋ- 'inside', **anŋena** 'soul'	**anəR-** 'breathe', **anəRnəR** 'breath, soul', A **anR(i)-** 'breathe, blow, voice, soul'
*n'-	
jaqjaq 'seagull'	**n'aRujaR** 'seagull' (Sir **jaRəja**; < ***n'aqujaR**?)
java- 'use'	PY **navəR(aR)-** 'borrow, exchange' (Sir **javəR(ət)-**)
jəɣ-/iɣə 'wind'	**n'əɣəR** 'north wind', A **ɣi-ðɣi-** 'breeze' (also PE **n'əɣ-ilaR**, Sir **jəɣica** 'parka ruff')
jup- 'stick (onto s.th.)'	**n'əpət-** 'stick', A **hmata-** 'put in pocket under parka', **hmaci-** 'stick between s.th.' (also **n'əvə-** 'cling', Sir **jəvət-** 'stick', **jəftəR-** 'stick in')
*-ŋ-	
ŋa-rŋən(en) 'outside, weather'	**uŋa(n)** 'area on other side'
C **kaŋo-lɣən** 'kind of seagull'	**kaŋuR** 'snow goose'
æŋi- 'tell s.th. secret'	PI **aŋŋi-** 'keep secret'
*c-, -c-	
cəɣæj 'sand'	PI **ci(ɣ)uRaq** 'sand' (A **cuɣu-**)
cakəɣet 'sister'	**caki** 'father- or mother-in-law' (and **cakiRaR** 'brother-or sister-in-law'), A **cikiiða-** 'wife's brother, sister's husband'
əccaj 'aunt'	**accaɣ** 'paternal aunt'
ciŋkæ- 'spit', C **ciŋqe(ciŋ)** 'spurt of water', I **cq-** 'wet' (S **ckezin** 'mud')	**ciqəR-, ciqqi-** 'splash' (A **ciqa-** 'splash', **ciXi-** 'make wet')
cik(jæ)- 'dive'	**cikə(t)-** 'lower head', A **ciikit-** 'tilt'
cimæt- 'break up'	**ciðamə(t)-** 'scatter, pulverize' (and **ciðaɣ-** 'spread out', A 'stretch')
(c)ivtə- 'low'	PY **civaR-** 'go down' (& **civə-** 'cut through', CAY **cəvak** 'low place')
*s'-	
cəvi-/ləvi- 'cut'	**caviɣ** 'knife', A **saami-X** 'stone knife'
liɣ(liɣ)/ciɣ- 'egg' (I **lvilx**)	**ciɣi-** 'brittle, crack' (A **sixsi-** 'break in two')
læwət/cæwət 'head'	**civu** 'front'
*l-, -l-	
əlpə-lŋən 'cheek' (I **p'əlXaŋ**)	**uɬuɣaɣ** 'cheek' (A **uluɣa-X**)

I **kuɬX** 'tundra' (S **kuxad** 'tundra, swamp')	PY **kilɣaq** 'wilderness'
kili-/kele- 'rub' (I **kle-**)	**kəliɣ-** 'scrape'
lovə- 'suck breast'	**əv-jaŋ(ŋ)iR** 'breast' (and perhaps **əva-** 'sit on eggs, care for young')
*w-, -w-	
wala 'knife' (I **faɬ-c**)	**ulu(R)** 'semi-lunar knife'
awət(a) 'skin scraper'	**avəɣ-/avət-** 'separate'
wæməlkæt 'lip'	PI **uməlRuq** 'snout' (WG also 'lip (of seal, etc.)')
æww-æt- 'go away'	PY **awitə-** 'move aside (intr.)' (P **av(v)aRiR-** 'remove, be removed')
*-v-	
vəRæj 'grass'	**əvəɣ** 'grass'
leval- 'wave'	**əvə(R)-luɣ-** 'flap'
*j-, -j-	
aj-tat- 'chase, herd'	**ajaɣ-** 'push, thrust at with pole', A **ajaquðaax** 'sea otter spear, small harpoon'
jit- 'drip' (I **est-**)	A **it-** 'fall', **icaRi-** 'drip'
ɣajma- 'be eager, happy', I **xajma-ŋto-** 'be merry' (& E **kejulu** 'amusing')	**kaju-** 'be strong' (and A 'have hopeful expectation', PI **kajuŋŋiq-** 'be eager to go')
jeqa- 'nose'	**iqəR** 'corner of mouth', PY **iqək** 'point, tip', A **iiqi-X** 'inside corner' (and NSY **əqə** 'cheek')
jət- 'go for or to' (dom. harmony)	**itəR-** 'go in', A **ita-** 'go in, have room'
*u-	
uvik(i) 'body' (and **uvig-ril** 'trunk', **uvi-rit** 'soul')	**uvinəɣ** 'body, skin'
ð-umk-æv- 'hide, store'[21]	**uməɣ-** 'cover, close', E A **umta-** 'weigh down on'
ujwæl- '(pronounce) magic spell'	PI **ujvala-** 'practise sorcery' (PE **ujvi** 'mental ability')
*o-, -o-	
joR(ə)- 'reach'	**uR-nəɣ-** 'go towards' (and PY **uR-niR-** 'aim at')
top- 'cover'	**tupəR** 'tent, temporary dwelling'
waj 'here you are', **wajəŋ-qen** 'that just there'	**uv(a)-**, A **wa-** 'this'[22]

*-e-	
jelRa 'cousin', I **sel(l)a-tumx** 'sibling of same sex'	**illuRaR** 'cross-cousin' (< ***jil(l)uRaR**?)
kət-ka 'foot' (E I pl. **ketxed**, S **kasxc** 'shin'[23])	**kit-miɣ** 'heel', A **kita-** 'foot')
*æ-	
æl-væ 'other' (I **ɬva-**; < ***æt-væ**?)	**atla** 'other' (< ***at-la**), A **asl-** 'time/position corresponding to -'
æræt- 'fall' (E I **erenezic** 'falls')	PI **əžət-** 'fall' (PE **əðə-vkaR-**)
ækək(æ) 'son'[24]	PI **akkak** 'paternal uncle
mæmi 'storage hut' (I **mem**)	**mamtəRaR** 'cache, temporary dwelling'[25]
æŋæŋ 'spirit, god'	**aŋə-** 'big', A **aŋu-na-** 'big', **aŋax** 'power, steward'
əninæ-lRən 'elder brother'[26]	**anəŋaR** 'elder brother (of woman)', PI **anə(k)** 'elder brother'
*a-	
alpənŋən 'patch on sole' (I **atɬemk'a-nəŋ**)	**aɬŋiɣ** 'patch on sole'
accəRat- 'lie down'	**at(ə)-** 'down', A **ac-** 'lower part of'
ajŋon 'long ago'	PY **ajumiq** 'long ago' (PE **aju-** 'go further')
*i-	
ilu- 'move, stir', I **le?lo-** 'stir'	PI **iləqə-** 'shake head', **iləqšaq-** 'squirm'
-ɣiŋ 'below'	**kiŋu-** 'after, behind', A **kiŋ-** 'time after, younger sibling'
it- 'be' (I **it-/ɬ-**)	**əl-/ət-** 'be (at, thus)'
*ə-, -ə-	
kəlvə- 'notch (reindeer's ear)'	**kələ(t)-**, PY **kələvə-** 'cut skin into strips (for rope)'
əp- 'steep' (C also 'fall into sea (river)'	**əp-naR** 'cliff'
I **kəpkəp** 'tooth' (and S **kipu-skik** 'bites')	**kəpə-** 'cut'

6.2.2. Eskimo-Aleut and Uralo-Yukagir

Most of the following correspondences have already been pointed out in Fortescue (1994, 27ff), where also possible Altaic cognates are mentioned. Only the most solid are given here. The PU forms are as in Rédei (1988a) unless marked 'Samm.' for Sammallahti (1988), who is cited when there is a significant difference in reconstruction (question-marks are Rédei's - most of his forms so marked are not

listed by Sammallahti). In general, Sammallahti's reconstructions can be taken as reliable, although the exact phonetic nature of several of his segments is uncertain and the number of reconstructed forms is much more restricted than in Rédei[27]. PS (Proto-Samoyedic) forms not in Sammallahti are from Janhunen (1977). Any indeterminate vowel - whether front or back - is given as 'V', although Rédei distinguishes the two types; I retain on the other hand his stem-final /e/, where Sammallahti has a final /i/ or /ï/ (perhaps from /ə/). Since so many of the Uralic cognates also have Yukagir equivalents I put these together under PU, though this should not be taken to imply that they necessarily form an intermediate grouping (PUY) between hypothetical Proto-US and the individual family proto-languages (their lexical correlation may simply have been more firmly established). The Yukagir forms (really roots) are from Nikolaeva's unpublished dictionary and can be taken as Proto-Yukagir; in some cases they have been extended with additional suffixed material as in the individual languages (and my own files). Note that various medial consonant clusters preserved in PU appear to have been reduced in EA (I have not separately exemplified medial stops as in 6.2.1 for that reason); also that medial */m/ may go to /w/ in Y (sometimes also in E); and that velars before a back vowel in PU correspond to uvulars in EA (also in modern but not Proto-Yukagir)[28]. A number of the cognate sets here overlap with those in 6.2.1 - they will be combined in 6.2.5.

Additional abbreviations: FU = Finno-Ugric, FP = Finno-Permic, FV = Finno-Volgic (all in proto-language form except as noted), PS = Proto-Samoyedic, Nen = Nenets, Hung = Hungarian, T = Tundra and K = Kolyma (Yukagir), PI = Proto-Inuit, Mal = Malimiut, WG = West Greenlandic, NAI = North Alaskan Inupiaq, SPI = Seward Peninsula Inupiaq, PY = Proto-Yupik, CAY = Central Alaskan Yupik, Sir = Sirenikski, Cher = Cheremis, Vot = Votyak, Fi = Finnish. The (F)U forms are PU unless otherwise marked. As in 6.2.1, the Proto-E(A) forms are generally Proto-Eskimo, unless the Aleut has been added.

Proto-(F)U	*Proto-E(A)*
*p-	
paðV 'weir, dam'	**paðə** 'entrance', A **haðɣi-X** 'channel, narrow entrance (to bay)'
FU **pal'a** 'ice crust, freeze' (Fi **pala-** 'burn')	**paliR-** 'be parched'
FU **pelV-** 'cut into, prick'	**pilaɣ-** 'cut up', A **hilɣi-** 'dig (out)'
FU **pitV-** 'tie'	**pətuɣ-** 'tie up'
packV- 'penetrate'	**pətə-** 'penetrate'
pukta- 'hop, run' (Y **pöɣ-/pöŋk-** 'run away')	**pəkə-** 'jump up', A **hiki-** 'disappear'
pura- 'drill' (and/or FU? **purV-** 'go in' - Samm. FP **pura-**; Réd. also PU **puru** 'space behind')	**pula-** 'enter, penetrate', A **hula-** 'dawn, be new (moon)'
puwV-/puɣV- 'blow' (Samm. **puwi-**; K **puj-** 'blow')	**puvə-** 'swell', PI **puvak** 'lungs', A **hum-** 'swell, inflate'
PU? **purkV** 'snowdrift, snow-storm' (Samm. FU **purki**)	**piR-tuR** 'snowstorm' (< ***puqə-**?)

FU **pVcV-** 'layer, turn over, pile up' (back first V)	**puci-** 'turn over, be upside down', A **husuɣ-** 'lie prostrate'
FU **poŋka** 'hill' (Y **pöŋkə**)	**pəŋuR** 'rounded hillock on tundra'
FU **puc'a-** 'squeeze'	**putjuɣ-/pumjuɣ-** 'pinch'
FU **paŋka**, PS **pəŋkə** 'shaft, handle'	**pakiɣ-** 'hook fingers onto'
*t-	
ta 'that' (Y **ta-ŋ** 'that')	**ta-** 'anaphoric prefix', A **tacim** '(not) yet'
PU? **tappa-** 'stamp, hit'	**tupaɣ-** 'startle', A **tuhmða-** 'produce a crack, explode'
FU **tuðka** 'tip, point'	**təkəR** 'index finger' (& PI **təkkuaq-** 'point'), A **tikla-** 'middle finger'
tukte 'transom, cross-piece in boat'	**tukəR-** 'brace or push against with feet'
tumte- 'feel' (Samm. 'understand')	**tucaR-** (<*tut-jaR-) 'hear', A **tut(a)-** 'hear, feel'
tuŋke- 'stick or stuff in'	PI **tutquq-** (<*tunquR-) 'store away' (also PE **tuŋvaR-**)
*t'-	
canca-/caca- 'step, go', PS **t[1]ənt[1]V-** 'run, trot'[29]	**tutə-** 'step'
FU **cacV/cocV** 'storage space under sleeping platform' (& PS **t[1]et[1]** 'tent cover')	**tatə-** 'jam in', A **caci-** 'cover, close'
PS **t[1]əjwə-** (<*cul-wə-?) 'arrive'	**tulaɣ-**, A **cala-** 'arrive, land'
PS **cəkV-** 'groan'	**tuqluR-** 'throat, call out', A **cuqa-** 'throat'
*k-	
PS **käpə-** 'cut (with axe)'	**kapə-** 'stab'
kanV- 'call'	**qanəR** 'mouth' (as verb 'speak')
kälä- 'wade across'[30] (Y **kil-** 'wade')	**kaləvə(t)-** 'sink into mud or water'
PS **kəncə** 'sledge'	PY **qanžak** 'small sled'
kälV 'bay, swampy lake' (Y ***kel-** 'interval, middle')	**kəlu** 'area at back', A **klu-** 'go into (e.g. bay)'
FU **kämä** 'hard, firm'	**kəmək** 'flesh' (WG 'strength')
ke/ki 'who' (Y **kin**)	**ki-na**, A **kiin** 'who'
FP **kämä** 'shoe' (Samm.)	**kaməɣ** 'boot'
PU? **kule-** 'hear' (K **qol** 'sound')	**quliRaR-** 'tell about s.th.'
FU **kütki-/kitki-** 'tie' (PS **ket-**)	PI **kətək** 'strap for fastening s.th.'
kVcV- 'pull, pluck, rip' (back first vowel)	**qəcuɣ-** 'tear out, scratch', A **qiciX** 's.th. sharp'
FU **kolja** 'evil spirit'	**qəla** 'spirit, (verb) perform sorcery', A **qlat-** 'deceive, tempt'
konta 'cold, frost' (T **qand'ə-ŋ** 'cold, winter')	**qaniɣ** 'falling snow', A **qanax** 'winter'
konte 'basket'	PY **qantaq** 'container'

FU? **kore** 'skin, rind' (and PU **kora-** 'skin, peel'; Y **kar** 'skin')	PY **qaltə** 'bark'
kun'a- 'close eyes' (and Samm. has **kun'ïlï** 'tear')	PY **qunik** 'matter in eye, tear'
kompa 'wave' (Hung **hom** 'foam')	**qapuɣ** 'foam'
ku/ko 'what, which' (Y **ko-**, **ka-** 'which, when, how, where', & Ng **kaŋgə** 'when', **kuni ʔa** 'how')[31]	**qaŋa** 'when', PI **qanuq** 'how', A **qana-** 'which, where'
kunta 'tribe, family' (FU 'hunting party' in Samm.; K **kudejə** 'family, tribe')	**-qan/-qatə**, A **-qasi** 'fellow -'[32]
PS **kəmca-** 'pour' (and FU? **kVmV** 'river, current' with front vowels)	**kuvə-**, A **kum-** 'pour'
kVŋkV- 'throat' (back first vowel)	**qakəR(luɣ)** 'throat' (but also **quŋəciR** 'neck', A **quŋ** 'hump(back)')
PU **kanï-** 'carry' (Samm.), PS **kanə-** 'go off' (Y **kon-** 'go about, nomadize')[33]	**qani-** 'accompany part of the way'
*c'- (or *s'-)	
FU **c'appV-** 'hit, chop' (and Nen **s'apa-** 'hack', Y **s'avkə-** 'knock, crack')	**cipə(ɣ)-** 'crack, burst', A **sihmi-** 'whip, spank'
FU **c'älä-/s'älä-** 'cut'[34], PS **sil-** 'sharpen'	**cili-** 'sharpen'
FU **c'uppV** 'spear, lance' (Y **c'owïnə** - also T **c'upə-n'ə**, Nen **savak** 'sharp')	**caviɣ**, A **saamiX** 'knife'
c'ele- 'rub skin from antlers'[35]	**caɬiɣ-** 'scrape skin clean' (A **saaliklaasi-X** 'skin scraper')
FU **s'oma-** 'worry'	**cumiɣ-** 'be anxious'
FU **c'aŋkV-/s'äNkV-** 'break (intr.)' (also **c'ärke-**)	**ciɣi-** 'be brittle, crack', A **sixsi-** 'break in two'
FU **s'arV-** 'dry, get dry' (Samm. **s'ora-** 'wither')	**caluɣ-** 'tan, be tanned dry', A **saaluX** 'dry weather'
s'epä 'neck' (Fi also 'front of sledge'; and/or PU **s'VwV-** 'harness to sledge' with back first V)	**civu-** 'front'
c'äke 'hard snow, hard trampled ground in winter'[36]	**ciku** '(sea) ice'
*c-	
FU **cVkkV** 'clump of wood' (with back vowels; Ostyak also 'door post')	**cukaR** 'post, support'
Mordvin **covar**[37] 'sand'	PI **ci(ɣ)uRaq**, A **cuɣu-** 'sand'

*s-

saɣe- 'come, get to'	**aɣə-** 'go over', **aɣɣiR-** 'come', A **aɣ-** 'go by, pass'
seɣe-/sewe- 'eat'	**iɣə-** 'swallow'
sula- 'thaw'	**ulə-**, A **ulRi-** 'overflow'
FU **sekä** 'space between'	**aku** 'space between'

*l-

FU **le-** 'become, be' (Y **l'ə-** 'be')	**-li-** 'become'
lupsa 'moisture, dew'	**əvtəR** 'juice', **əvjaŋ(ŋ)iR** 'breast'
FU **läppa-** 'choke'	**əpə-** 'choke, suffocate'
PS **ɬəpV** 'oar, row', FV **leppV** 'blade, shovel' (Y **lipə** 'snow shovel')	**ipu-t-** 'row', **ipuɣ-** 'lever up'

*-l-/-l'-

FU **kälV** 'lace, string'	**kəluɣ** 'stitch' (and/or A **kala-** 'string (beads or fish on line)'
kul'ma 'place above eyes'	**qavlu(R)** 'eyebrow', A **qami-x** 'eyebrows'

*-r-

kure- 'tie' (Y **kur-** 'hook on to')	**qilaɣ-** 'knit', **qiɬəR-** 'tie', A **qilRi-X** 'umbilical cord' (and **qisat-** 'tie')
s'erV 'order, row, nature' (K **šar** 'something')	**cila**, A **sla-X** 'weather, nature, outside'

-ð-/-ð'-

kað'a 'mountain'	**qaðə** 'area above, surface', A **qacXi-X** 'skin, bark' (and/or **qasa-** 'surface after diving')
kuðjV 'cover' (Y **kuðə-** 'rise, go up')	PI **qu(C)ək** 'bone in rear flipper of seal', A **quðɣ-** 'top, back'
FU **keðe/kiðe** 'spring'	**kiðaɣ** 'summer, heat'

*-ɣ-

PS **kiə** 'hole', **kiətV-** 'perforate' (Y **kiɣi-** 'stab, gore')	PI **kəɣaq-** 'notch' (and PE **kəɣə-**, A **kiɣ-** 'bite')
weɣe- (Samm. FU **wixi-**) 'take' (Y **weɣe-**)	PI **aa-t-**, A **aɣa-t-** 'take'

*m-

FU[38] **mäke** 'hill' (Réd. has PU **mäkte**; T **mugi-l**)	**makə(t)-** 'get up', A **haɣ-** 'grow up, open'
mälke 'breast' (Y **mel-ud**[39])	PI **malak** 'chest', A **hala-** 'turn head'
mVrV 's.th. protruding' (back first vowel; also FP **merV** 'breast')	**mulə(ɣ)** 'nipple' (but also **məluɣ-** 'nipple, suck'), A **huluX** 'nipple, seed'
mene- 'go' (& Réd. has **mentä-**	**mənət-** 'pass over at distribution'

'miss' - Y **mönte-** 'go past')	
muna 'egg'	**manniɣ** 'egg'
PS **mël** 'wave' (Y ***meli**[40])	PI **malək** 'wave', A **hal-** 'windward'
mV 'here, this' (K **mi-gidə** 'to here', **mə** 'here you are', T **mə(r)-** 'verb focus marker')	**ma(ð)-** 'this, here'
FU **mulV-** 'pass by'	**mulu-** 'stay away a long time'
Fi **mehu** 'juice'	**məcu(ɣ)** 'liquid'
***n-**	
na/nä 'this', PS p.p. base **nä-** (also Y **ki-n** 'who', Fi 1s **mi-nä**, etc.)	**-na** 'singulative of dem./q- words (and **na-** 'where, which', A **qa-na** 'where')
nejðe 'girl, daughter' (K **n'el** 'daughter-in-law' <***nVjVl**)	**najaɣ** 'younger sister' (CAY 'unmarried girl')
näke- 'look, see'	PI **naku(R)-** 'squint' (WG also 'stare at')
nemV 'small fly'	**nəvju-vaɣ** 'fly'
PS **nul-** 'stop'	**nulqaR-** 'stop, hesitate', PI **nullaq-** 'stop, make camp'
nime 'name' (Y **niw**)	**nəpə** 'sound, voice', PI **nəmaaq-** 'groan'
PS **nüt-/nüc-** 'pull'	**nuccuɣ-** 'tug'
***n'-**	
FU **n'arV** 'skin with hair removed' (Samm. **n'ori**; T **n'ar**)	**n'alu(C)aR** 'bleached sealskin'
n'ikV- 'bend down'[41] (Y **niɣ(i)-** 'bend, bow')	**n'əka-** 'feel inferior'
FU **n'omV-** 'squeeze together' (Y **n'öm-**)	**n'əməR-** 'binding, wrap', A **tmax** 'long seaweed (for fishing)' (Sir **jəməR-vəx** 'groove for lashing drumskin to rim')
PS **n'ämpa** 'head, forehead'	**n'apa-** 'be upright' (Sir **japaR-** 'raise'; also PI **napatkaq-** 'fall head first')
n'amV-/n'ämV- 'soft'	**n'əvɣuR** 'fish slime' (NAI **niuɣuq/juuɣuq**, SPI **juɣɣuq**)
***-ŋ-**	
PU **päŋe** 'top, head'	**piŋ-** 'up there', A **hiŋ-** 'right there' (also **paɣ-**, A **haɣ-** 'right there')[42]
piŋV 'fist, flat of hand'	**piŋu-** 'push' (A **hiŋu-**)
niŋä 'woman, female'	**nəŋjuR** 'oldest woman in household'
***a-** (and ***ï-**?)	
ala 'space below' (Samm. **ïla**, PS **ilə**; Y **al** 'below', also Ugric **alama** 'straw insole or underlayer')	**at(ə)-** 'below' (PY **aci-**, perhaps <***al-tə**), A **ac-** 'lower part'[43]

FU **ama-** 'scoop out' (Y **V(w)-** <***Vmə-**)	**amu-** 'pull up', A **amilRi-X** 'fishing place', E A **amlu-** 'draw, bail out'
an'a 'mother, wife of older relative' (Samm. FU 'sister-in-law')[44]	**a(a)na** 'mother, grandmother', **ana(a)na** 'older female relative', Sir **nana** 'mother'
arŋe 'opening' (Samm. FU **arŋi** 'mouth'[45]), also FU **arŋa-** 'loosen, open' (Y **arŋa** 'mouth')	**arŋ-va-** 'open', **arŋi-** 'loosen (by soaking)' (NSY **arŋit-** 'unwrap'), A **arŋi-** 'start'
appe (Samm.**ïppï**) 'father-in-law'	**ap(p)a** 'grandfather'
arV- 'rip'	**aɬəɣ-** 'rip' (note affix **-ləɣ-** 'back and forth')
*ä-	
FU **äne** 'voice' (Y **an-** 'speak', **an-cū** 'tongue, word')	**anəR-** 'breathe', A **anR(i)-** 'breath, voice, soul' (& **anə-** 'go out', A **anqa-** 'stand up, set out')
Ugric **älV** 'other/far side'	**ali** 'place far off'
ekä 'uncle'	PI **akkak** 'paternal uncle'
*e-	
elä- 'live'	**əl-/ət-** 'be'
e- 'neg. verb', **elä** 'not' (Y **əl-** 'neg. prefix')	**-(ŋ)il-**, A **-la(ɣ)-** 'not'
*i-	
ime- 'suck' (Y **iw(i)-** 'suck')	**əməR-** 'drink, drinking water', **əmmuɣ-** 'suck breast' , A **ma-qða-** 'suck breast'
VnV (Vot **in**) 'place'	**ənə** 'place', A **na(ɣ)-** 'inside'
*o-	
o/u 'that'	**uv-**, A **w(a)-** 'this, that'
ojwa 'head'	**uja(quR)**, A **uju-X** 'neck'
FU **olV** 'chin, lower jaw' (Samm. **ola** 'jaw')	PY **ulu(q)** 'tongue' (A **ulu-X** 'meat')
FU **orŋte** 'hollow' (also 'nest')	**uŋ-lu** 'nest'
oc'a- 'see, watch over' (Fi **odotta-** 'wait')	**utaqə-** 'wait'
oma 'old, previous'	**im-** 'obscured dem. root' (also 'long ago'), A **um-** 'dem. root - heard but not seen'
*j-	
Vogul **jūwl'ə** 'behind' (Y **jowlə** 'id.')	**av(a)-** 'over there, down coast' (**avaliR** 'outermost place'), A **aw(a)** 'over there or going away'
PS **jäm** 'sea, big river'	**imaR** 'sea, contents'
jelä 'sun, day' (& Y **jel'ə-** 'boil, be cooked', K **jelɔɜə** 'sun')	**ələɣ-** 'get burnt' (A **ilɣ-** 'stench')

juta- 'go'[46]	**itəR-** 'go in', A **ita-** 'contain', Atkan **it-** 'fit in'
*-j-	
peje- 'cook, boil' (Samm. **pexe-**)[47]	**pujuR** 'smoke, steam' (A **hujuX**)
aja- 'drive, chase'	**ajaɣ-** 'push', A **ajaquðaax** 'small harpoon'
*w-	
FU **welje** 'brother, friend' (Y **wal'-** 'next to', **wal'-po** 'companion', PS **wəj** 'half')	**ila** 'relative, friend, part' (A 'part')
PU? **wiŋa/wüŋa** 'belt, girth'	**uŋəR-** 'tie, lace up'
FU **wole-/wöle-** 'cut, whittle'	**ulu(R)** 'semi-lunar knife'
FU **wol'V-** 'remove bark from tree'	**ulət-** 'turn inside out' (A **ula-t-**)
FU **wVnV** 'old' (front initial V)	PI **inəq-** 'be finished, adult', A **ina-** 'finish'
FV **wene-** 'stretch' (Y **wen-**)	**ini-** 'hang out', PI **inniq-** 'stretch skin for drying', A **ni-s** 'drying rack for fish'
PS **warə** 'edge, rim', FV **were** 'edge, side'	**aðiR** 'sleeve', A **aðiX** 'lip, edge'

Note also: Y **ar-imə** 'sole'[48] - PE **aluR**, PI also **alaq** 'sole'; Y **caɣil** 'thigh(bone)' (K **c'oRul** 'spinal cord, marrow', T **c'aRil/c'oRil** 'leg, marrow') - PI **caunəq** 'bone', **caulluq-** 'remove marrow' (NAI **saulluq** 'spinal cord'); T **c'alʒə-ŋ** 'hand, arm' (older **tolonсə-ŋ**) - PE **taɬiR** 'arm', A **talRi-X** 'branch, tentacle'; Y **cuɣ-/ cuŋk-** (fast) - PE **cuk(k)a-** ('id.'), A **sukalu-** 'be tired after running' (and perhaps PI **cukat-**, A **sukat-** 'tighten'); K **ewud** 'virgin snow' - PE **aput** 'snow on ground'; K **ilbədə-** 'shake, stir' - PI **ileqə-** 'shake head', **ileqšaq-** 'squirm'; Y **jeŋkilə** 'fire' - PE **əkə-** 'burn'; Y **joŋk(u)l** 'nose' - PE **iqəR** 'corner of mouth'; Y **kejlə-** 'red' - PI **kajuq** 'reddish (animal)'; Y **mal(ə)-** 'double, two' - PE **malRuɣ** 'two'; K **pən** 'thing, nature' -PE **pi(-)** 'thing, do, etc.'; Y **pol-** 'leaf' (and perhaps Cheremis **pöl-** 'ear, leaf') - PE **pəɬu** 'leaf'; K **qola** 'scoop' - PE **qalu-** 'dip, scoop' (also noun), T **sajə-** 'rock, sway' - PE **cajuɣ-** 'tug, twitch' (WG **sajuC-** 'tremble'), A **saju-** 'pull'; Y **tant-** 'give' - PE **tunə-** ('id.'); Y **tattī** 'vertical pole in tent' - PE **tatə** 'support' (CSY **tatəkə** intersection of poles at top of trad. house'); Y **töw-** 'cover' - PE **tupəR** 'tent'; Y **u(C)-** 'roast' - PE **uɣu-** 'be heated up, cooked'; T **umusej-** 'close' - PE **uməɣ-** 'close'; Y **waŋ-cī-** 'look for' - PE **aŋu-** 'hunt, catch up with'; and Ng **küma-** 'knife' - PE **kəma-liR** 'sewing knife'.

6.2.3. Yukagir and Uralic

There are about 150 Uralo-Yukagir cognates given in Nikolaeva 1988a, some of which are of course more solid than others. Compare with this figure the ca. 400 tentative PU cognates in Collinder (1940) and the under 200 PU ones in Sammallahti (1988);

Rédei (1988a) is closer to Collinder in this respect, but he marks many of his reconstructed forms as doubtful at the PU level. Below I present some of the best of Nikolaeva's sets, but to save space I shall not repeat the ones that have already been included in 6.2.2. Note the apparent reduction of Uralic intervocalic geminates to plain stops as in FU **rVppV-** 'break, burst' corresponding to Y **lepe-** 'break off' below[49], also of single stops to corresponding voiced fricatives, as in **n'ike-** to **niG(i)-** 'bend, bow', and of intervocalic */m/ to */w/ (or long V) in Yukagir 'schwa-stems' like **V(w)-** from ***amV-**, both given under 6.2.2. Many medial clusters appear to have been simplified in Y (as also in CK and EA) when compared to PU. I follow Nikolaeva's practice of distinguishing */c'/ and */c/ and of leaving long vowels as such in the PY forms (as mentioned earlier, she now sees them as reflecting vowel plus sonorant combinations). However, I have replaced her /å/ with /o/ (as she herself has done in more recent articles)[50], her theoretical /ъ/ with /s/ (also the palatalized equivalent), and her /q/ with /k/ (in back vowel harmony words - her 'q' for PY, as for Old Yukagir, is a convention). The Yukagir forms are to be understood as Proto-Yukagir and the Uralic forms I give in exactly the form she cites (mainly as in Rédei), apart from a few long vowel diacritics (neither in Rédei or Sammallahti), which I have removed, and with 'V' for any uncertain vowel.

c'aca 'older brother' - PU **c'eca** ('id.'; Samm. **cecä**)
c'olo- 'tie on, add' - FU **c'olme** 'knot' (Samm. **s'olmi**)
K **e(duŋ)** 'this' - PU **e** 'id.'
ec'e(C) 'father' - PU **ic'ä** ('id.')
emej 'mother' - PU **emä**
ïm- 'sit (on conveyance)' - PU **amV-** 'sit'
jat- 'straight' - PS **jet-** 'against'
jom-p- 'be ill, die' - PU **jama-** ('id.')
jVj 'belt' - PU **jäje** ('id.')
kal- 'fish' (in T **qal-dawa** 'scale, fish skin') - **PU kala** 'fish'[51]
kelinc'ə 'worm' - PU **kVlV** ('id.')
kel(i)-l 'brother-in-law' - PU **kälV** 'in-law'
kewe- 'go' - FV **käwe-** ('id.')
kic'- 'end, top' - FU **kac'a** ('id.')
kir(e) 'knife' - PU **kurV** ('id.')[52]
köj 'man' - PU **koje** 'husband' (Samm. **koji** 'male')
kökə 'head (of fish or animal)' - FU **kokka** 'protruding, sharp part'
könte- 'lie' - PU **kontV-** 'sleep'
kön'c'ə 'larva' - FU **kuncV** 'worm, larva' (but also **kun'c'V** 'ant')
lamðV- 'low' - PU **lamte-** ('id.')
lep(u)-l 'blood' - FV **leppä** ('id.')
lepe- 'break off' - FU **rVppV-** 'break, burst'
lipə 'snow shovel' - FV **lippV** 'shovel, shovel-like board'[53]
mon- 'say' - PU **monV-** ('id.')
nowð(V)- 'chase, pursue' - PU **n'owða-** ('id.')
n'el- 'lick' - PU **n'ole-** ('id.')
n'or(i)l 'swamp, meadow' - PU **n'orV** 'swamp, tundra'

ö(C) 'child' - PS **üə** ('id.')
paj- 'hit' - PS **pəj-** 'beat'
paŋk(u)-l 'net' - PS **poŋka** ('id.')
pe(C) 'rock' - PU **pijV** ('id.')
pejə 'cheek' - PU **poske** ('id.')
pöc- 'trot' - FU **pucV-** 'run'
pön- 'put' - PU **pane-** ('id.'; Samm. **pïnï-**)
puð(e)- 'top, above' - PU **piðe-** 'long, high'
sar- 'root' - FU **särV** 'vein, root'
s'al 'tree' - FU **s'ala** 'elm'
s'al'kə 'eider duck' - FU **s'oð'ka** '(kind of) duck'
s'olV 'gut' - FU **s'ole** ('id.')
ti/tu 'this' - PU **tä/te/ti** ('id.')
tuŋ-/töŋ- 'close' - PU **toŋe-** ('id.')
tV- (old K) 'give' - FU **toɣe-** 'bring, take, give'[54]
wonc(V)- 'root' - PU **wancV** ('id.')

6.2.4. Chukotko-Kamchatkan and Uralic (and Nivkh)

In listing the better CK - Uralic cognates that have been suggested in the past (and adding a number of my own) I have not always been able to locate a Proto-Uralic (or FU) form, although I have added one wherever possible. The forms given are PC unless otherwise marked; those given for individual languages are as in the main source here, Bouda (1940).

ajtat- 'chase, herd' - PU **aja-** 'drive, chase'
ajval 'wind side, wind break' - FP **saja/soj** 'shelter'
ajwa 'brain' (I **a?juv?aj**) - FU **ojwa** 'head'
ælæ 'summer' (I **laml-**, E **adomot** '(in) summer') - PU **sula-** 'thaw' (cf. Y **al'(a)-** 'melt')
ær- 'flow out' (**ær-iŋ** 'shore', K **aj-ɣəjŋən** 'low tide', C equiv. 'mouth of river' acc. Bog.) - PU **sarV** 'current, lake' (cf. Kolyma Y **erə-** 'flow, float')
æræm(æ) 'leader' - Selkup **orm/orp** 'strength'
caca- 'tasty' - Votyak **c'es-kət**, Zyryan **c'es'-kyd** 'tasty, sweet'
cəmjə- 'bitter' (I **əmc'-**) - FU **cemV** 'sour'
ɣalɣa 'duck, bird' - Mordvin **gala** 'goose'[55]
ɣəræp 'sing, song' - Votyak **gur**, Zyryan **gor** 'song'
ɣəv- (I **va-c**, Sed. **kof**, E **kval**) 'stone' - FU **kiwe** 'stone' (cf. Tundra Y **qaj-l'** stone')
ilə 'damp, wet' (and perhaps I **i?** 'water') - FU **siðV** 'dampness, swampy place'
javal 'behind, back' (I **sal-**) - Vogul **juwl'ə** 'behind' (cf. Y **jowlə** 'id.')
jæɣ 'foot, paw' - FU **jalka** 'foot, leg' (Samm. **jïlka**)
jæjwæl 'orphan' - PS **jVjwa** 'orphan'
jət- 'go for' - PU **juta-** 'go'
kæv(kæv) 'cartilage - Mordvin **kavur** ('id.')
ker(ker) 'woman's fur combination suit, clothes' - FU **kere** 'skin, rind', PS **ker-** 'put

on (clothes)'
kəɣwa(t)- 'dry up' - Fi **kuiva-** ('id.')
kəltə- 'tie' - FU **kälV** 'lace, string'
kumŋə 'voice' - Nenets **xumna/xubna** 'sound'
kəmɣət- 'bunch up', **kəmRukæt-**, I **kovos-** 'roll up in ball' - FU **kämä** 'hard, firm'
leval- 'wave', FU **rVppV-** (front vowels) 'flap wings, fly', (cf. Y **lïwa-/lïmpa-** 'rock back and forth')
ləlæ/cəlæ 'eye' (I **lə-ŋ**, pl. **lu-ʔl**) - PU **s'ilma** ('id.')
lovə- 'suck breast' (I **əlxʔe-** 'suck') - PU **l'upša** 'dew' (but also FP **lüpsä-** 'milk'; Samm. has **lupsa** 'moisture'; cf. Y **lowə-** 'drink', **low-jə** 'water')
mana-ŋ (I **ɬmaŋ**) 'dispersing, in different directions' (with 'dominant' allative suffix) - PU **mene-** 'go'
məlæ- 'break' - PU **molV-** 'break up, fragment'
miŋ-(kə) 'where, which' (I **maʔ** 'where') - FU **mi/me** 'what' (cf. Y **leme/neme**)
nanqən 'stomach' - Nenets **n'an**, Selkup **nandē** ('id.')[56]
nəmi(nəm) 'broth' - FU **leme** 'soup, juice'
nənnə 'name' (< * **nəm(nəm)**?) - PU **nime** ('id.')
ŋæ- 'get in or on' - FU **soŋe-** 'go in'
pamja 'fur stocking' - PS **päjma** 'reindeer skin boots'
pækul 'knife' - Selkup **pag(i)** ('id.')
pæŋ-kæ(l) 'hat' - PU **päŋe** 'head, tip'
pe(j)ecvak 'young male reindeer' (I **p'e-c** 'child, son') - FU **poca** 'reindeer calf' (and/or **poj** 'boy')
pəl- 'completely, intensely', I **p-laX** (< ***pəl-laX**?) 'big' - PU **paljV-** 'many' (cf. Tundra Y **puoj-**)
pənæ- 'whet, sharpen' (I **pnav-zo-**) - FU **pänV-** 'grind' (Votyak **penon** 'whetstone')
puqə 'bottom, behind' - PU **puwi** 'behind' (Samm. - Réd. has **pujV**; PS **puə**, so < ***puɣə**?)[57]
qal(a)- 'direction, side, area round' - PS **kaj(wə)** 'side'
qale-lle-ŋ 'downriver' (compare the preceding) - FU **le** 'down' (Samm. **luwi** 'downriver'; cf. Y **le-** 'down', K **lelluk**ə 'downriver')
qalɣe-jpə- 'go across mountain, hang across s.th. (intr.)'[58] - PU **kaðʾa** 'mountain'
qæj-/-qæj 'small, young' - PU **-k(k)a** 'diminutive'
(l)qət- 'go off' - FU **läkte-** 'go off' (cf. Y **jaqa-** < ***lak-** 'arrive')
qora 'domestic reindeer' - FU **kojra** 'male animal' (Samm. **koji** 'male'; Fi 'dog'), PS **kora** 'male wild reindeer'
(l)qut- 'stand up' - FU **salkV-** ('id.')
-ra- 'house, yaranga' - FU **purV-** 'enter'
tava- 'crush' - PU **tap(p)a-** 'hit, stamp on'
tæjkə- 'do, make' (I **skə-**) - FU **teke-** ('id.')
tæŋti- (Alutor **caŋci-**, **taŋti-**, Ch **tenti-**) 'tread on' - PU **canca-/ caca-** 'go, step'
təlæ- 'go' (I **ɬal(e)-** 'walk') - PU **tule-** 'come' (Samm. **tolï-**)
təlvə- 'burn (oneself)' - PU **tule** 'fire'
til(til) 'wing' - PU **tuɣl(ï)** 'feather' (Samm.; Réd. has **tulka** 'wing')

wapaqa 'fly agaric' - FU **paŋka** (Samm. **piŋka**) 'fly agaric'
wæjæm 'river' - FP **vija-**, 'flow, current' (cf. Y **waj-** 'id.')
wəje-ŋto- 'breathe', **wəji-** 'air' (I **fcet-** 'breathe', **fcif-c** 'breath, air') - PU **wajŋe** 'soul, breath'
wəltə- 'close together' - FU **welje** 'brother, friend'
win- 'tame' - Fi **viene** 'gentle'
winvə 'tracks' - Fi **vainu** ('id.')

Note also C **cəq-**/PC **ləq-** 'be cold' - Yukagir **c'aqə-** 'freeze'; C **cimɣʔRu-**, Kerek **ciŋ-Ru-** 'think' - Y **c'uŋ-ðə-** ('id.'); **əja-va-** 'far' - Y **laj-** 'back, behind'[59]; CK **ənnə** 'fish' - Tundra Y **anilə**; C **jəq-** (also PC **əq-**) 'cold' - Y **jarkə** 'ice' (and FU **jakša** 'cold'; CK **liŋ(liŋ)/ciŋ** 'heart' - Y **s'uŋkV-nə-/s'uɣV-nə-** 'beat (heart)'; **pælqæt-** 'grow old' - Y **pöl-ut** '(old) man'; CK **təRol** 'piece of meat' - Y **c'ul** 'meat'[60]; and **uvvæt-** (I **ova-**) 'kiss' - Tundra Y **uva-** 'id.'.

In the light of the distinct possibility that there is at least a contact relationship between CK and Nivkh (which I do not regard as a Uralo-Siberian language), compare the correlations on Table 14 proposed by Tailleur (1960) - they represent the most promising from his list. I have left the Nivkh forms (on the left) as Tailleur has them, but where possible I have replaced his CK forms (from various sources) with the relevant modern Itelmen and/or proto-forms from Fortescue (1995a); all Itelmen forms marked W, E or S are from early sources. /y/ is a mid central or back unrounded vowel, and an apostrophe following a consonant indicates aspiration. Nivkh forms marked neither W (west) or E (east) are from older, less certain sources. Note that a few forms have already appeared with possible Uralic cognates on the list above.

TABLE 14

Nivkh-Chukotko-Kamchatkan correlates

Ni	CK
anz 'bowl for receiving portion at bear festival'	I **anaš** 'ladle'
E **ark'u-** 'cover'	**arkar(a)** 'sheath for weapon'
aui 'mouth'	**æw-** 'get a hole' (K **awaaw** 'wound')
cak 'harpoon'	C **ceko-cen** 'arrow tip'
W **cavr-** 'be grey'	C **cevaro** 'grey'
cecr 'tern (sterna longipennis)'	W I **šica** 'tern', E I **šićec** 'kind of seagull'
W **coɣ-** 'melt'	I **co-** 'melt'
E **dyr-**, W **ryr-u-** 'undo, untie'	**ðər-** 'untie'
W **eri** 'river' (**erxe-** 'flow')	**ær-** 'flow (out)' (W I **erizin** 'low tide')
W, E **hall** '(human) skin'	**kəlɣə** 'skin' (I **kəlvə-ɬX**)
hagi 'allium onion', E **haɣi** 'allium	W I **xekem**, E I **gekoč** 'bear root

victorialis'
hall 'name'
E **ir-** 'sharpen'
iwis's' 'pike (fish)'
jet'- 'take, bring'
juty- 'pour'
kama- 'run'
kanigs 'hut were idols are kept'
kauy-, xauy- 'dry'
kelam 'rasberry (rubus idaeus)'

W **kerq**, E **ki** 'sea'
W **kex** 'seagull'
kilks 'net needle'
kozem, k'ezm 'whitethorn' (crataegus sanguinea)'

E **lew(lew)-** 'deceive'
W **ligs**, E **ligz** 'wolf'

mezla(n), medlan 'rowan (sorbus aucuparia)'
mumk-ŋir 'small bowl'

W **mykyk** 'bream'
W **nonq** 'young of animal', E **nenq** 'doll'
E **ŋoj, ŋoi** 'penis'
W **p'eŋgr** 'insect'
W, E **pila-** 'big', E **pil-** 'be big, grow'
W **poju-** 'smoke (verb)'

W **proq** 'kind of duck (anus querquedula)'
E **p'xy-** 'return'
E **p'yt-** 'split'
W **q'av-**, E **qav-** 'very hot, boiling'
W **q'ax**, E **qaX** 'lance'

E **t'am-** 'stay calm', **tamar** 'still'

tawas' 'transversal poles between sides of tent'
tegra- 'steep'
W **t'omo**, E **t'oms** 'smokehole in roof'

(meum athamanticum)'
I **Xelaŋ** 'name'
irvə- 'sharp' (E I **ozvano** 'whetstone')
æwæc(u) 'kind of salmon'
jət- 'go for, fetch'
jit- 'drip'
kame- 'move around'
W I **kenegt** 'hut'
kəɣwa(t)- 'dry (up)'
W I **kelmen** 'sorbus kamtschatica', E I **kelmed** 'prunus padus'
I **qiX** 'sea'
W I **kagtgen** 'kind of seagull'
I W **kilx** 'net needle'
W I **kilam**, E I **kerem** 'whitethorn berry' (W I **kalasnem**, E **karasnoč** 'whitethorn')
C **lewlew-et-** 'mock'
l(ə)Riɣə- 'wolf' (**I Xivne, Xigne** 'wolf')
məc(Ral) 'rowan (berry)' (**I mc'e-** 'rowan berry', E I **bəc(əc)** 'rowan')
I **mumx** 'basket, bowl made of birch bark'
W I **mək** 'kind of salmon'
nænæ- 'child' (**I nʲenʲe-kecX** 'young child')
ŋojŋ(ən) 'tail' (**I ŋosx** 'tail')
K **piŋəcRæ** 'gnat, fly'
I °**pl-(l)aX** 'big' (PC **pəl-** 'completely')
pujæ- 'cook on hot stones in pit' (I 'steam', smoke')
W I **puzgekeč**, S I **pizkčič**, E I **purxč** 'duck (anus querquedula)'
pəkir- 'arrive'
-pət 'piece'
C **qewj-at-** 'evaporate' (**I qejv(e)-** 'boil')
S I **quaquanoč**, Uka **kokonoc** 'lance, spear'
təmɣə- 'be still, calm' (E I **təmsazin** 'stay calm')
tævər(i) 'pole at base of tent'

tækr-æt- 'go down'
I **tem(e)-** 'cover', **taməs** 'roof' (C

	ræ-tæm 'caribou skin to cover roof') W
t'us, E **tur** 'meat'	**tərɣə(tər)** 'meat'
E **tuvŋ** 'brother'	**tumɣ-** 'friend'
W **-t'xy**, E **txy** 'on'	**-tky-n** '(on) top of'
W **tylf** 'far', **tala-** 'be far'	I **t'al-** 'far'
E **uige** 'no'	**ujŋæ** 'no, not any'
ukk 'kind of carp'	**ukið** 'capelin (fish)'
vel, well 'kind of salmon (salmo lycaodon)'	**witə(wit)** 'kind of salmon (golets)' (I **fɬec, fiɬik** 'golets')
vulvu-ly 'black'	**vulqə-** 'dark'
E **wal-** 'cut'	**wala** 'knife' (**walatko-** 'cut with knife', I **faɬ-c** 'knife')
W **yu**, E **au, aw** 'voice'	**iv-** 'say'

Considerably more research is required before it can be decided which - if either - of the two lists of correlates presented in this section contains predominantly cognates as opposed to old loans[61].

6.2.5. Some Uralo-Siberian proto-forms

There would seem to be no significantly greater or lesser number of likely cognates between EA and CK than between EA and Uralic, which suggests that none of these language families stand closer to each other than any of them do to the hypothetical common source language ('Proto-Uralo-Siberian'). It is possible on the other hand that a distinct Uralo-Yukagir sub-grouping is justified - certainly it is convenient to continue using the label (and as regards possible shared innovations note the s'~c' variation from */s'/, palatal vowel harmony, and the distinction between schwa/consonant stems and full vowel stems). The vowel correlations and shared pronominal stems might suggest the possibility of a Chukotko-Kamchatkan-Eskimo-Aleut sub-grouping too, although this is far less certain (note that the important innovations of */s/ going to Ø and the development of phonemic uvulars are shared by modern Yukagir). If ever there was such an intermediate entity it has been largely obscured by divergent developments (owing probably to contact/substratum) in CK. Below I present the better sets that appear to have reflexes in at least three of the four ingredient proto-languages. Further examples of the sound correspondences involved have been given in sections 6.2.1 to 6.2.4.

At this point I should remind the reader of the general caveats made in sections 2.4 and 2.5 concerning the relative paucity of lexical correspondences on the one hand and, on the other, of the probably illusory nature of the notion of a homogenous proto-language as such at the kind of time depth that applies here. The following should be taken simply as the result of applying normal comparative methods uncritically. A number of sets also have reasonable Altaic cognates (including some basic pronouns, question words and kin terms), but I shall not proceed any further in that direction.

***aj(aɣ)-** 'push forward'
PU **aja-** 'drive, chase', PC **aj-tat-** 'chase, herd', EA **ajaɣ-** 'push, thrust at with pole'

***al(a)/ïl(a)** 'below'
PU **ala** 'space below' (Samm. **ïla**, PS **ilə**), PE **at(ə)-** 'down', PY **aci-**, A **ac-** 'place/part below', Y **al-** 'below', PC **accə-Rat-** 'lie down'

***am(u)-** 'scoop up'
FU **ama-** 'scoop out', Y **V(w)-** 'id.', PE **amu-** 'pull up', A **ami-lRi-X** 'fishing place', E A **amlu-** 'draw, bail out'[62]

***an'a** 'older female relative'
PU **an'a** 'wife of older relative' (Samm. FU 'sister-in-law'), T **en'̄e** 'mother', PE **a(a)na** 'mother, grandmother'

***aŋə** 'opening'
PU **aŋe** 'opening' (Samm. FU **aŋi** 'mouth'), FU **aŋa-** 'loosen, open', Y **aŋa** 'mouth', PE **aŋ-va-** 'open', **aŋi** - 'loosen', A 'start out', CK **ŋə-t-** 'set free'

***ap(p)a/ ïp(p)ï** 'grandfather'
PU **appe** 'father-in-law' (Samm. **ïppï**), CK **æpæ** 'grandfather', PE **ap(p)a** 'grandfather'

***äk(k)ä** 'male relative (of father)'
FU **ekä** 'paternal uncle', CK **ækək(æ)** 'son', PI **akkak** 'paternal uncle' (T **aka** 'elder brother')

***än(ə)-/an(əɣ)-**[63] 'breathe'
FU **äne** 'voice', Y **an-** 'speak', CK **anəŋ-** 'inside', **anŋena** 'soul', PE **anəR-** 'breathe', **anəR-nəR** 'breath, soul' (& **anə-** 'go out'), A **anR(i)-** 'breathe, blow, voice, soul'

***ciɣ(uɣ)/cuɣ(uɣ)** 'sand'
CK **cəɣæj** 'sand', PI **ci(ɣ)uR-aq** 'sand' (A **cuɣu-**), Mordvin **covar** ('id.')

***el(ä)-** 'be, exist'[64]
PU **elä-** 'live', PE **əl-/ət-** 'be (at/thus)', PC **it-/-i-**, I **it-/ ɬ-** 'be'

***el(l)ä** 'not'
PU **elä** 'not', **e-** 'neg. verb', FU neg. imperative **älä**, Y **əl-** 'neg. prefix', **əl'l'ə** 'not', PE **-(ŋ)il-**, A **-la(ɣ)-** 'not', PC **æ- -kə** 'neg. circumfix', **ællæ** 'not'

***emä** 'mother'
PU **emä** 'mother', PY **əma** 'mother', Y **emej** 'mother', PC **əmmə** 'mother (hypocoristic)'

***ilu-** 'move'
PC **ilu-** 'move, stir', PI **iləqə-** 'shake head', **iləq-šaq-** 'squirm', K **ilbə-də-** 'shake, stir'

***imə(ɣ)-** 'suck (breast)'
PU **ime-** 'suck', Y **iwi-** 'suck breast', PE **əməR-** 'drink, drinking water', **əmmuɣ-** 'suck breast', A **ma-qða-** 'suck (breast)', PC **(m)iməl** 'water', I **i'm-eməm** 'birch juice'

***jav(a)** 'way over there, behind'
Vogul **jŭwl'ə** 'behind', Y **jow-lə** ('id.'), PC **javal** 'behind, back', EA **av(a)-** 'way over there, down coast'

***jeləɣ-** 'burn'
PU **jelä** 'sun, day', Y **jel'ə-** 'boil, be cooked' (& K **jelɔ̄ʒə** 'sun'), PE **ələɣ-** 'get burnt' (A **ilɣ-** 'stench')

***joŋk(əɣ)-** 'nose, tip'
Y **joŋk(u)l** 'nose', PC **jeqa-** 'nose', PE **iq0R** 'corner of mouth', A **iiqi-X** 'inside corner', PY **iqək** 'point, tip'

***jutə(ɣ)-** 'go (in)to'
PU **juta-** 'go', EA **itəR-** 'go in', CK **jət-** 'go to or for'

***ka/ko** 'what'[65]
PU **ku/ko** 'what, which', Y **ko-, ka-** 'which, when, how, where', PE **qa-ŋa** 'when', PI **qanuq** 'how', A **qana-** 'which, where' (and CK exclamation **qu(n)**)

***kað'a** 'mountain'
PU **kað'a** 'mountain', PE **qaðə** 'area above, surface', A **qacXi-X** 'skin, bark' (and/or **qasa-** 'surface after diving'), PC **qalɣe-jpə-** 'go across mountain, hang across s.th. (intr.)'

***kanə-** 'go off'
PU **kanï-** 'go/carry off', PS **kanə-** 'go', PE **qani-** 'accompany part of the way', Y **kon-** 'go about, nomadize'

***kan(iɣ)** 'cold, winter'
PU **konta** 'cold, frost', T **qand'ə-ŋ** 'cold, winter', PE **qaniɣ** 'falling snow', A **qanax** 'winter'

***kälə-** 'wade across'
PU **kälä-** 'wade across', Y **kil-** 'wade', PE **kalə-və(t)-** 'sink into mud or water'[66]

***käl(uɣ)-** 'lace up'
FU **kälV** 'lace, string', PE **kəluɣ** 'stitch', PC **kəltə-** 'tie'[67]

***käm(əɣ)-** 'hard, strong'
FU **kämä** 'hard, firm', PI **kəmək** 'flesh' (WG 'strength'), PC **kəmɣət-** 'bunch up'

***käm(əɣ)** 'footware'
FP **kämä** 'shoe', PE **kaməɣ** 'boot' (verbal 'put on footware'),
I **koma-** 'dress, put shoes on' (E **kemgaz**, S **kinkumag** boots')

***keðe(ɣ)** 'warmth, summer'
FV **keðe/kiðe** 'spring', I **xka-** 'hot' (S **kika**, E **kekak** 'heat'), PE **kiðaɣ-** 'hot, heat'

***kerə/korə** 'skin'
FU **kere/kore** 'skin, rind' (and PU **kora-** 'skin, peel'), PY **qaltə** 'bark', Y **kar** 'skin', PC **ker(ker)** 'combination suit, clothes'

***ki** 'who'
PU **ke/ki** 'who', Y **kin**, PE **ki-na**, A **ki-in** 'who', CK **mæ-ki** 'who'

***kiɣ(aɣ)-** 'perforate'
PS **kiə-tʊ-** 'perforate', Y **kiɣi-** 'stab', PI **kəɣaq-** 'notch' (and PE **kəɣə-**, A **kiɣ-** 'bite')

***koj(ra)** 'male animal'
FU **kojra** 'male animal' (Samm. **koji** 'male', Réd. 'husband' - Fi 'dog'), PS **kora** 'male wild reindeer', PC **qora** 'domestic reindeer', Y **köj** 'man'

***kuð'(ə)/kul'(ə)** 'above, cover'
PU **kuðjV** 'cover', Y **kuðə-** 'rise, go up', PI **qu(C)ək** 'bone in rear flipper of seal', A **quðɣ-** 'top, back', CK **qulɣən** '(fish) skin, bark' (and PE **qulə-** 'above', A **qul-** 'for sake of, because of')

***kulə-** 'make sound'
PU **kule-** 'hear', K **qol** 'sound', PE **quli-RaR-** 'tell about s.th.', CK **quli-** 'cry, shout'

***kumə-** 'flow'
PS **kəmca-** 'pour' (and FU **kVmV** 'river'), PE **kuvə-**, A **kum-** 'pour' (and PE **kuðəɣ** 'river'), I **kiv** 'river'

***kunta** 'fellow(s), tribe'
PU **kunta** 'tribe, family', K **kudejə** 'id.', PE **-qan/-qatə**, A **-qasi** 'fellow -'

***kurə(ɣ)-** 'tie'
PU **kure-** 'tie', Y **kur-** 'hook on to', PE **qilaɣ-** 'knit', **qiɬəR-** 'tie', A **qilRi-X** 'umbilical cord' (and **qisa-t-** 'tie')

***le-** 'become'
FU **le-** 'be, become', Y **l'ə-** 'be', PE **-li-** 'become', I **le-** 'become'

***lepə-/lempa-** 'flap'
FU **rVppV-** 'fly, flap wings' (but also **lempV-** 'fly'), CK **leval-** 'wave', PE **əvə-(R)luɣ-** 'flap' (and **əvcuɣ-** 'shake'), Y **lïwa-/ lïmpa-** 'rock back and forth'

***lep(p)ə** 'oar'
PS **ləpV** 'oar, row', FV **lippV** 'blade, shovel' (& PU **lapV** 'oar', FU **leppV** 'blade'), Y **lipə** 'snow shovel', PE **ipu-t-** 'row', **ipuɣ-** 'lever up'

***lup(sa)** 'liquid'
PU **lupsa** 'moisture, dew' (but also FV **lüpsä-** 'milk (verb)'), CK **lovə-** 'suck breast', PE **əv-jaŋ(ŋ)iR** 'breast' (also **əvtəR** 'juice'), Y **lowə-** 'drink' (and **low-jə** 'water')

***mal(iɣ)/mïl(iɣ)** 'wave'
PS **mëlə** 'wave', Y **meli** 'wave', PI **malək** 'wave', A **hal-** 'windward' (and CK **məɣ(məɣ)** 'wave')

***mäkə-** 'go up'
FU **mäke** 'hill' (PS **mektə**), T **mugi-l** ('id.'), PE **makə(t)-** 'get up', A **haɣ-** 'grow up', Koryak **make-lŋən** 'upper lip'

***mäl(kə)** 'chest'
PU **mälke** 'breast', Y **mel-ud** 'breast', PI **malak** 'chest'

***me** 'here, this'
PU **mV** 'here, this', K **mi-gidə** 'to here', **mə** 'here you are', T **mə(r)-** 'pred. focus', EA **ma(ð)-** 'this, here', PC **-əm** 'focus marker'

***menə-** 'go'
PU **mene-** 'go' (& **mentä-** 'miss'), Y **mönte-** 'go past',), PE **mənət-** 'pass over at distribution', PC **mana-ŋ** 'dispersing, in different directions'

***mi** 'what'
FU **mi/me** 'what', Y **leme/neme**, PC **miŋ-(kə)** 'where, which', I **ma?** 'where'

***muɣə-** 'roam'
PS **müə-tə-** (& ***müɣ** 'day's journey by caravan')[68], PC **məɣu-** 'nomadize' (& Koryak **məɣu-jil** 'reindeer caravan'), PY **məɣə/muɣu-** 'go off far' (Sir **muɣul?ij** 'caravan')

***na/nä** 'this'
PU **na/nä** 'this' (and Fi **ke-n**, etc.), PE **-na**, A **-n** 'singulative of dem./q-words' (and **na-** 'where'), PC **(ə)n-**, I **nu-** 'this'

***naj(aɣ)** 'girl'
PU **nejðe** 'girl, daughter', K **n'el** 'daughter-in-law' (< ***nVjVl**), PE **najaɣ** 'younger sister' (CAY 'unmarried girl')

***nimə** 'name, call'
PU **nime** 'name', Y **niw** ('id.'), EA **nəpə** 'sound, voice' (PI **nəmaaq-** 'groan'), PC **nənnə** 'name'

***n'ar(u)** 'skin with hair removed'
FU **n'arV** 'skin with hair removed' (Samm. **n'ori**), T **n'ar** 'id.', PE **n'alu(C)aR** 'bleached sealskin'

***n'ik(a)-** 'bend down'
PU **n'ikV-** 'bend down', Y **niɣ(i)-** 'bend, bow', PE **n'əka-** 'feel inferior'

***n'om(əɣ)-** 'squeeze, roll up'
FU **n'omV-** 'squeeze together', Y **n'öm-** ('id.'), PE **n'əməR-** 'bind, wrap'

***o(w)-** 'this, that'
PU **o/u** 'that', PE **uv-**, A **w(a)-** 'this, that', PC **waj** 'here you are' (and **wajəŋ-qen** 'that')

***oj(wa)** 'head, neck'
FU **ojwa** 'head', PE **uja(quR)**, A **uju-X** 'neck', CK **ajwa** 'brain'

***ol(u)** 'cheek, jaw'
FU **olV** 'jaw, chin' (Samm. **ola** 'jaw'), CK **əlpə-lŋən** 'cheek', PE **uɬuɣaɣ**, A **uluɣa-X** 'cheek' (also PY **ulu(q)** 'tongue', A **ulu-X** 'meat')

***paŋkiɣ-** 'grasp'
FU **paŋka**, PS **pəŋkə** 'shaft, handle', PE **pakiɣ-** 'hook fingers onto', PC **væɣə-lku-** 'scratch' (& **væɣ-** 'claw')

***pat'k(ə)-** 'penetrate'
PU **packV-** 'penetrate', C **pat-ɣərɣən** 'hole', PE **pətə-** 'penetrate', PI **pətta-q** 'hole'[69]

***päŋə** 'top'
PU **päŋe** 'top, head', PE **piŋ-** 'up there', A **hiŋ-** 'right there' (also **paɣ-**, A **haɣ-** 'up there'), PC **pæŋkæ(l)** 'hat'

***pejə(ɣ)-/pojə(ɣ)-** 'cook, steam'
PU **peje-** 'cook', CK **pujæ-** 'cook on hot stones in pit' (I 'steam', 'smoke', & C **puj ʔepuj** 'soot'), EA **pujuR** 'smoke'

***pel(ju)** 'leaf or ear'
Y **pol-** 'leaf' (also perhaps Cheremis **pöl-** 'ear, leaf'), I **pəla(pəl)** 'leaf', PE **pəɬu** 'leaf'

***pel(aɣ)-** 'cut up, flense'
FU **pelV-** 'cut into, prick', PE **pilaɣ-** 'cut up', A **hilɣi-** 'dig (out)', CK **pəl-** 'scrape skin'

*pit(uɣ)- 'tie up'
FU pitV- 'tie', CK pət- 'tie up', PE pətuɣ- 'tie up'

*poŋkə 'hillock'
FU poŋka 'hill', Y pöŋkə 'id.', PE pəŋuR 'rounded hillock on tundra'
*pu(ŋ)kə-/pü(ŋ)kə- 'jump'

PU pukta- 'hop, run', Y pöɣ-/ pöŋk- 'run away', PE pəkə- 'jump up', A hiki- 'disappear', PC piŋku- 'jump'

*pura- 'go in'
FU purV- 'go in' (Samm. FP pura-; Réd. also PU puru 'space behind' and pura- 'drill'), PE pula- 'enter, penetrate', A hula- 'dawn', PC -ra- 'house'

*puwə-/puɣə- 'swell'
PU puwV-/puɣV- 'blow', PE puvə- 'swell', PI puvak 'lungs', A hum- 'inflate', K puj- 'blow'[70]

*sac'(c')a(ɣ)- 'paternal aunt'
FU sac'e 'aunt', CK əccaj 'aunt', PE accaɣ 'paternal aunt'

*saɣə- 'come, go'
PU saɣe- (Samm. FP sëxi-) 'arrive, come', EA aɣə- 'go over', aɣɣiR- 'come', Y eɣ- 'go, walk'

*sarə- 'flow down or out'
PU sarV 'current, lake', K erə- 'flow, float', PC ær- 'flow out' (& ær-ɣiŋ 'shore', æræt- 'fall'), PI əzət- (PE əðə-vkaR-) 'fall'

*seɣə- 'eat'
PU sewe-/seɣe- 'eat', PE iɣə- 'swallow', Y leɣ- 'eat'

*soŋə- 'get into/onto s.th.'
FU soŋe- 'go in', PC ŋæ- 'get into sled or boat', PE iŋət-, A uŋut- 'sit down'[71]

*sula- 'thaw'
FU sula- 'thaw', Y al'(a)- 'melt', PE ulə-, A ulRi- 'overflow' (and CK ælæ 'summer')

*s'akə-/s'äkə- 'freeze'
PU c'äke 'hard snow', PE ciku 'sea ice' (& PI ciRmiq 'ice formed on ground'), Y c'aqə- 'freeze' (as noun 'frozen fish'), PC cəq-/ləq- 'be cold'

*s'ap(p)ə- 'hack'
FU c'appV- 'hit, chop' (Nen s'apa- 'hack'), Y s'avkə- 'knock, crack'), PE cipə(ɣ)- 'crack, burst', A sihmi- 'whip, spank'

*s'ärŋkə- 'break'
FU c'aŋkV-/s'äNkV-/c'ärke- 'break (intr.)', PE ciɣi- 'be brittle, crack', A sixsi- 'break in two', CK liɣ(liɣ) (PC also ciɣ-) 'egg'

*s'ep(u) 'neck'
PU s'epä 'neck' (also 'front of sledge'), PE civu- 'front', PC læwət/cæwət 'head'

*s'erä 'surroundings, nature'
PU s'erV 'order, row, nature', PE cila, A slaX 'weather, nature, outside', K šar 'something'

*s'om(əɣ)- 'worry, think'
FU s'omV- 'worry', PC cimɣəRu- 'think' (Kerek ciŋ-Ru-), PY cumәR- 'think', PE cumiɣ- 'be anxious'[72]

*s'up(p)ə-[73] 'cut or stab'
FU c'uppV 'spear', Y c'owï-nə 'spear', PE caviɣ, A saamiX 'knife', PC cəvi-/ləvi- 'cut'

*ta 'that'
PU ta 'that', Y ta-ŋ 'id.', PE ta- 'anaphoric prefix' (A ta-cim '(not) yet')

*tap(p)a(ɣ)- 'strike'
PC tava- 'crush', PU tap(p)a- 'hit, stamp on', PE tupaɣ- 'startle', A tuhm-ða- 'produce a crack, explode'

*teŋ(ä)-[74] 'fly up'
PE təŋə- 'fly up', CK ðiŋæ- (<* tiŋæ-) 'fly up', Y PS ti- 'fly' (and Nen tiŋgə- 'fly up')

*toɣə- 'take'
FU toɣe- 'bring, take, give', K (old) tV- 'give', CK təɣiŋrə- 'pull out', I txoŋ(e)- 'pull', PE təɣu-, A su- 'take'

*tuðka 'tip'
FU tuðka 'tip, point', PE təkəR 'index finger' (& PI təkkuaq- 'point'), A tikla- 'middle finger', CK -tkə- '(on) top of'

*tuɣlï/tiluɣ[75] 'wing, feather'
PU tuɣl(ï), PS tuəj 'feather, wing' (Samm. - Réd. has PU tulka 'wing', the FU form in Samm.), CK til(til) 'wing', PE culuɣ, CSY siluk 'wing feather' (& PY ciluR- 'soar'), Y tiwil 'wing'

*tup(əɣ)- 'cover'
CK top- 'cover', PE tupəR 'tent, temporary dwelling', Y töw- 'cover'

***t'ant'ə-/t'unt'ə-** 'step'
PU **canca-/caca-** 'go, step', PS **təntV-** 'run, trot', PC **tæŋti-** (Alutor **caŋci-/taŋti-**, C **tenti-**) 'tread on', PE **tutə-** 'step, tread on'

***t'ono/t'eno** 'back'
FU **cäncä** 'back'[76], PE **tunu** 'back' (& **tunnuq** 'back fat of caribou'), A **cunu-X** 'back of neck', E I **teno** 'shoulder'

***uɣ(ə)-/uj(ə)-** 'cook over fire'
Y **u(C)-** 'roast', PE **uɣu-** 'be heated up, cooked', PC **uji-**, I **oje-** 'light fire (in oven)'

***wejə-** 'flow'
FP **vija-**, Y **waj-** 'flow, current', CK **wæjæm** 'river'

***wel(ja)** 'thing or person next to'
FU **welje** 'brother, friend', PS **wəj** 'half', Y **wal'-** 'next to', **wal'-po** 'companion', EA **ila** 'relative, friend, part' (A 'part'), PC **wəltə** 'close together'

***wen(i)-** 'stretch skin out to dry'
FV **wene-** 'stretch', Y **wen-** 'id.', PE **ini-** 'hang out', PI **inniq-** 'stretch skin for drying', A **ni-s** 'drying rack for fish', **in-ka-** 'hang'

***wolə(ɣ)** 'knife, cut'
FU **wole-/wöle-** 'cut, whittle', PE **ulu(R)** 'semi-lunar knife',
CK **wala** 'knife'

This list looks remarkably like the kind of common lexical heritage one would expect of mesolithic fishermen/hunters who knew about netting fish and treating animal skins but were not occupied with sea mammal hunting. The lack of common etymons for numerals or colours should not worry us, since these may have very heterogenous sources even within individual families - thus no colour terms and only the numeral 'one' and 'four' are common to Eskimo and Aleut, and according to Sammallahti (1988) only 'two' and 'five' are reconstructible for Proto-Uralic (and no common colour terms at all)[77]. More significantly, speakers of Proto-Uralo-Siberian evidently also had boats to paddle: Bering Strait would have been easy enough for them to cross - from East Cape on the Asian side one can actually see (on a clear day) the mountains of the Alaskan mainland in the distance beyond the Diomede Islands.

6.3. Loan-words from within and without

As opposed to the genetically common lexical material apparently shared by the various Uralo-Siberian languages, which predates specialization into sea mammal hunters and reindeer breeders, many loan words from one area to another reflect a difference in modes of subsistence - e.g. Eskimo **qujŋiq** 'domestic reindeer', borrowed from the reindeer-herding Chukchi. Going the other way, compare for example **tukken**

'harpoon tip' borrowed into Chukchi from Eskimo. Much specialized reindeer-related lexicon has been borrowed from Even into Tundra Yukagir in particular, which can be directly related to what is known of the introduction of this new form of economy to the Yukagir hunters and fishermen by a northerly group of Tungusic nomads[78]. Of course there are also words for individual cultural/technological innovations that have diffused through contact of a less intense sort. Only in relatively recent times, when the smallest, most marginalized groups have been on the point of linguistic absorption by speakers of dominant neighbouring languages (for example the Itelmen on Kamchatka or the Siberian Eskimos on Chukotka) has borrowing of more basic vocabulary become pronounced. Today, of course, massive borrowing from Russian or English has taken place in most areas[79]. Bergsland (1986, 106f.) presents a detailed coverage of Aleut loanwords in Eskimo (and v.v.). As he points out, there is a suprisingly large number of terms referring to fauna and flora borrowed from Aleut, greatest in immediately adjacent Pacific Eskimo (Alutiiq Yupik, 'AY'). This may reflect the early specialized adaptation of the Aleuts to a strictly coastal environment, but it also says something of the great influence exerted by the once dynamic and demographically more concentrated Aleut culture on its socially less aggressive and less hierarchically organized northern neighbours. This local borrowing overlays the lexical heritage common to both branches of EA, which, it should be noted, includes some basic terms relating to sea mammal hunting such as 'cross-strap on kayak deck' and 'kayak' itself (so it cannot be maintained - as Menovščikov 1974 tried to) that Aleut and Eskimo split before such technology developed[80]. It is not always possible to distinguish old loans from cognates - or to tell which way the loans went - although there is usually some phonological clue. A selection of clear loans from Aleut into Eskimo (CAY unless otherwise indicated) can be seen on Table 15, followed by some of the (far fewer) loans the other way (Atkan forms are given unless E A - Eastern Aleut - is specified). For more detailed commentary see Bergsland (op. cit.).

TABLE 15

Borrowings between Aleut and Eskimo

Into Eskimo:
taaŋaq 'water, liquor' (the first meaning AY only; also into Inupiaq)
saRa- 'sleep' (Chugach AY only)
isuRi(q) 'hair seal'
uɣinaq 'sea lion'
laɣiq 'Brant goose'
aRliaq/ taRliaq 'black-legged kittiwake'
caɣiq/ saɣiq 'halibut' (also to Athabaskan Tanaina)
kalaaq 'sculpin' (also to Tanaina)
qakiijaq 'silver salmon'
alaɣnaq 'type of red berry'
kajaluq 'stern of kayak'
isXan 'carrying bag of woven grass'
kaɣi- 'sweep' (AY only)

aŋiqiq 'left hand' (Koniag AY only)

Into Aleut:
E A **juRja-n** 'northern lights'
kanu(u)jaX 'copper'
nuɣi-s, E A **nuɣi-n** 'bird dart with three prongs'
caajax 'drum'
taliX- 'dance with masks and drum' (from Inupiaq)
E A **caamRuX** 'small piece of wood drifted ashore'

As Leer points out, the apparent lack of cognates between Aleut and any of the remaining northwest American coast languages may reflect the disappearance of some intermediate language with the arrival of the Yupik Alutiit (Leer 1991, 188). The few loans that exist are either via Alutiiq Eskimo (thus Aleut **caɣuða-x** 'wooden hat, visor', Tlingit **s'ax** 'hat'), or post-contact (thus Eastern Aleut **Xaaja-X** 'steambath', Tlingit **Xaaj**). Leer's ongoing work with Na-Dene lexical reconstruction may turn up more, however. The number of loans from Athabaskan into both Eskimo and Aleut is also very low, virtually limited to **cii(q)** 'shee fish' (Eskimo) and **nuuniq** 'porcupine' (Eskimo and Aleut), although Alutiiq has borrowed somewhat more from neighbouring Tanaina (the borrowing has generally been greater in the other direction - cf. Kari 1989, 522 & 564). Note too that the Kobuk Inupiaq spoken by Athabaskans who have shifted language recently, as reported by Kaplan, also lacks significant numbers of loans (perhaps only the word for 'moose'- see Bergsland 1997, 2).

On a more local level (Bering Strait itself), a number of Naukanski Yupik words have been borrowed into the Diomede sub-dialect of Inupiaq and some have gone the other way. In the now extinct Imaqliq version of the dialect spoken by the Big Diomede islanders (as described by Menovščikov 1980), who were moved to the Asian side after the last war, the number of Naukanski loans is (or rather was) considerably greater - not surprisingly since many Naukanski families had already moved onto the island by the end of the war. Forms given by Menovščikov that are clearly borrowed from Naukanski include: **ošaq** 'house', **maptəaq** 'walrus skin tent', **ɬəqɬəq** 'swan', **na(a)manəq** 'calm (at sea)', **məzutaq** 'cranberry', **alaRloq** 'bearberry', **kələvaq** 'west', and **akšoRnit-** 'be ruddy, red in face'. Some of these are not in common usage amongst Diomeders on the American side today, but L. Kaplan (pers. comm.) also gives the following common words of Naukanski origin for Little Diomede: **qillin** 'ceiling', **muRraC-** 'bark', **taituk** 'fog', and **manŋiq** 'egg'. A number of such loans into Diomede are ultimately of Chukchi origin (such as **kənmaŋqaq** 'lagoon' and **aupaupək** 'may as well'), and others are common Eskimo words but with local Naukanski-influenced meanings - note in particular **maptəaq** above, which in Proto-Eskimo (**mamtəRaq**) meant 'covered storage pit for food', then came to mean 'semi-subterranean house' in Yupik and finally just 'house' (as also in most Seward Peninsula Eskimo). But in the Diomede sub-dialect the meaning is the special one of their Naukanski Siberian neighbours, who had replaced the traditional Eskimo-style semi-subterranean winter houses with year-round walrus-skin 'yarangas' of the sort introduced to the area by the Chukchi.

Borrowed the other way into Naukanski are at least: **akɬaq** 'brown bear', **əlquaRniq** 'smelt', **imunəq** 'wrinkle', and **iput-** 'row' and **ipun** 'oar' (the latter perhaps retentions lost in other Yupik, however). Another important word in Naukanski Yupik that could be a retention rather than a loan is **suna** 'what', as opposed to **ca** in all other Yupik (both on the Alaskan and on the Asian side), but the preservation of the original form in neighbouring Inupiaq probably reinforced its retention. Note too the */c/ to /s/ change here, typical of the Inuit branch, which has (within this century) reached all of Siberian Yupik now, but doubtles started with Naukanski.

The selection on Table 16 typifies lexical loans from Chukchi to Central Siberian Yupik and (to a lesser degree) the other way. For the many particles - adverbial and conjunctional - borrowed from Chukchi in all varieties of Siberian Yupik see de Reuse (1994, 366ff)[81]. The wide array of words borrowed (significantly including some basic social organization terms) reflects the intense affect on Siberian Eskimo of Chukchi in recent times: only a handful of these loans - all for things originating on or native to the Asian side - crossed over to Alaskan Yupik (they are marked '& CAY'). Such loans show some phonotactic pecularities, such as the initial /r/ in **ramkə**.

TABLE 16

Chukchi loans in CSY and v.v.

Into CSY:
asəŋə- 'duty, owe'
awanRalə 'clan member'
awisu 'king salmon'
ɣajmaawi- 'be engrossed in s.th., be wasteful with s.th.'
ɣujɣu 'summer house, wooden house'
ɣuunaq '(pine) nut'
jajwaalə 'orphan'
kamaɣritə 'mammoth (tusk)'
kajŋə 'brown bear'
kimaawi- 'delay, hinder'
kujŋə 'pipe' (& CAY)
lalala 'dew'
mataawi- 'have a hard time'
nəmətva- 'stay home, in one place'
ŋilvil '(reindeer) herd'
pitija 'dish of boiled reindeer gut'
qərɣu 'dwarf Siberian cedar pine'
qujŋiq '(domesticated) reindeer' (& CAY)
raatamə 'winter skin cover of yaranga/tent dwelling'
ramkə 'clan, ethnic group'
rəpa 'hammer'
rultaŋiq 'the constellation of Orion'

səmŋa 'male domestic reindeer'
silimuqa 'poison'
tanŋə 'raider, enemy'
walɣujaaq 'snowshoe'
wapaaqa 'fly agaric' (today also 'marijuana')
watapə 'reindeer moss, lichen'

Into Chukchi:
epləqətet 'bolas (for catching birds)'
kemərɣət 'men's sealskin boots'
kupren '(seine) net'
makə 'diaper, back flap of child's overalls'
potora l ɣən 'women's dance'
pu(u)req 'beluga (whale)'
taqʔə 'provisions taken on a journey'
tʔejutʔej 'salt, sea water'
tukken 'harpoon tip'
tutlik 'plover, sandpiper'[82]
ukəmʔu- 'tow boat along shore'

Just a few CK loans made it into Aleut too, but these were probably due to the early Russian traders, who brought native people with them from Kamchatka (Bergsland 1986, 106). Notable here are **kalikaX** 'paper, letter' (Alaskan but not Siberian Yupik **kalikaq**), from Koryak **kalikal** 'book, letter', etc., and **cixtiX** 'fox den', **ixtiX** 'house pit (after abandoned house)' (Eskimo CAY **ixta**, CSY **riixta**, Sir **ɘcixta** 'den, lair'), from Chukchi **rɣə-**, Koryak **jɣə-/cɣə-** 'dig'.

Chukotkan languages (in particular Koryak and Alutor) have also been the source for many Itelmen loans, not surprisingly given the peripheralization of Itelmen on Kamchatka and the advance of the Koryak into their original territory (already underway before the arrival of the Russians, to judge from Krašeninnikov's account). Nor is it surprising that a good many of these loans concern reindeer herding and sea mammal hunting (pursuits introduced or limited amongst the traditional Kamchadal). Some of the 'basic' meaning loanwords (including a number of common adjectival stems) are of very recent date, replacing native words attested in old sources, though there are many more of that kind from Russian. There are virtually no loans, as far as I can ascertain, in the opposite direction to Koryak (though there are apparently a good many in the adjacent Karagin dialect of Alutor on the east coast). In most cases loans can be recognized on phonological grounds (e.g. by initial voiced consonants where the principal, Napan dialect would have unvoiced ones), but there is a chronological layering of loans over a long period of contact in evidence in the region (probably also between the different forms of Kamchadal/Itelmen) and this makes it difficult to distinguish old loans and cognates in the absence of a clear picture of dialect variation within Itelmen in the past. On the following, highly selective list, note that some of the items have also been borrowed - via Chukchi - into Eskimo (including some common particles).

TABLE 17

Borrowings into Itelmen from Chukotkan

ajtat- 'drive (animals)'
ano-k '(in) spring'
evun 'all the same, however'
ɣirnik/ virnik 'animal'
iv- 'long'
jajar 'drum'
jalvət- 'nomadize, wander'
jaqjaq 'seagull'
jepx 'still'
jilqət- 'sleep' (Sedanka)
jovaj 'loon'
juŋju-cX 'whale'
lʲaŋe 'girl'
meməl 'bearded seal'
ŋele '(reindeer) herd'
omakaŋ 'together'
pəŋlo- 'ask' (Sedanka)
qejuc 'reindeer calf'
rce'n 'lungs'
retem 'cured caribou leather'
temjuŋ- 'crafty'
ujetik 'sledge'
uvik 'body, self'
°vapq 'fly agaric'
vetat- 'work'
volvol 'thimble'
ven 'if'
Xolʲa 'boy'
Xopt 'big, also'

For the numerous Even terms to do with the domestication of the reindeer borrowed into Yukagir see Krejnovič (1958, 247f.). In general, however, many of the words he gives as 'due to contact' between Yukagir and various other Siberian languages I (and Nikolaeva) see rather as old cognates (if valid at all). Apart from the Even loans related to the switch to a new economic subsistance pattern - and recent loans from Yakut and Russian (of which there are many) - the number of actual loans may be more restricted than the impression Krejnovič gives. Nikolaeva points out that there is in particular very little evidence of direct loans between Samoyedic and Yukagir (pers. comm). Most intriguing are the kinship terms, which in large part seem to be shared by Siberian people, including the Yukagir and Evens. It is thus not clear whether Tundra Yukagir **en'e** 'mother' is a loan from or cognate with Even **enin** of

that meaning. Note also Y **epe** 'grandmother, elder sister of father', Proto-Tungus ***eveke** 'elder sister' (Cincius 1977, 433) but PS **äpa** 'elder sister' (also Turkic in both 'grandfather/ grandmother' and 'elder sister' senses). More likely to be direct loans from Even are Tundra **ama** 'father' and **aka** 'older brother', also **mirijəŋ** 'wife' (Even **merenne** 'bride'), but in at least one case the borrowing - if that is what it is - probably went the other way, namely Y **enc'e** into Even **en'ze** 'uncle', also Chukchi **ənjiw**. One way or the other, this suggests considerable frequency of intermarriage in these parts across language boundaries. There is evidence of several distinct chronological layers of borrowing in Yukagir from Tungusic languages, difficult to disentangle (see Nikolaeva 1988a, 174f.); some of the 'basic' meaning loans may be of relatively recent date[6]. Probable loans into Yukagir are listed on Table 18 (Tundra unless otherwise marked); what the immediate donor language was is not always apparent:

TABLE 18

Borrowings into Yukagir

abukā 'kind of kaftan' (Ev **odyka** 'man's costume')
aje 'crossbow' (Ya **aja** 'id.')
al'Rə 'fish' (Ev **olrə**)
K **cirqas'ī** 'knife' (Tungusic **cüru-kan**)
iniŋie 'sledge for transport' (Koryak **ineŋ(e)**)
Chuvan **jajdel'** 'fox' (Chukchi **jatjol**, Koryak **jajol**)
katka 'hatchet' (CK **katɣa**)
kē 'friend' (Even **ge** 'id.')
lalimən 'sled' (Ev **nolima** 'id.')
mawut ' lasso' (Even **māwut** 'id.')
moŋqeŋ 'net' (Ya **muŋxa** 'id.')
K **mure** 'boots' (Ev **muren** 'id.')
nimeŋ, K **numo**, **nume** 'dwelling, house' - Tungus **nimä** 'guest, neighbour, neighbouring house'[7]
n'awə- 'white' (Ev **n'ōbal-**)
K **n'oŋo-** 'blue' (Tungusic **n'og-** 'blue, green')
omo/ɒməŋ 'tribe' - Yakut **omuk** 'stranger'[8]
paɣaʒī 'awl' (Tu **pugu**)
K **pō** 'slave' (Ev **bol** 'id.')
qajsar 'skis' (Even **kajsar**, Yakut **Xajəsar** 'id.')
soRō- (K **saRa-**, < ***soko-**) 'be lost' (Tungusic **sokoriv-**)
s'ōborə 'trough' (Ya **sabaraj** 'large bowl for meat')
ura- 'study, learn' (Ya **ural-** 'id.')

One apparent loan-word from Yukagir into Chukotkan suggests the relatively peaceful relations between these people, namely **vel-** 'price, trade'. Although the Tundra Yukagir correlates, **wal'ə** 'price, **wal'ite-** 'pay' (<***wal-/wol-**) have a good Uralic cognate, FU **wosa/wïsa** 'goods' (and cf. Finnish **osta-** 'buy'), this is unlikely to

be a cognate in Chukotkan since Uralic /w/ should appear as /w/ (the bilabial pronunciation of /v/ in most Chukchi but not Koryak) and there are no other instances I know of where Uralic /s/ goes with /l/ rather than zero in CK.

Rédei (1988b) discusses early Indo-European borrowing in Uralic (including Samoyedic); this may have started as early as the 4th millenium BC, but the interpretation of such items as borrowings as opposed to, say, common 'Nostratic' or 'Eurasiatic' is the subject of ongoing debate. By the second millenium BC there are less disputable loans, more directly reflecting Indo-Iranian, though where geographically they entered Uralic is uncertain (note that some could have come from Tocharian or its predecessor - Rédei op. cit., 644). In the Sayan region there is clear lexical indication of a Samoyedic substratum in Siberian Turkic languages of the region, and a good many ancient Turkic loans in Samoyedic as a whole (including, not surprisingly, words for 'horse', 'stirrup' and 'hundred'), which may be dated to the last centuries BC, and reflect a specifically Chuvash form of Turkic according to Rónas-Tas (1988, 745).

None of this suggests the same intensity and complexity of mutual lexical borrowing and diffusion as amongst the languages of the northwest coast of America, for example, a true 'Sprachbund' area where the demographic density (and the number of languages and dialects) was of course much higher. Nevertheless, borrowings represent an important ingredient in the overall linguistic picture within Greater Beringia - especially at the interface with the steppe peoples to the south. Those situations where lexical borrowing has been strongest prior to recent colonial state incursions are to be found either around the entry to a bottleneck (e.g. in the influence exerted from Chukchi on Siberian Yupik) or when a new economic basis has been introduced into an economically backward and demographically depleted region by speakers of a dominant language (e.g. influence from Tungusic on Yukagir) - or both together (e.g. influence from Koryak on Itelmen).

We have now come as far as we can (for the time being at least) in applying ordinary comparative methods to the elucidation of linguistic links across Bering Strait. The lexical material is perhaps not substantial enough to satisfy strict comparativist criteria for the proof of genetic relationship, but it is surely sufficient to render reasonably likely some kind of historical relationship between Eskimo-Aleut and the Asian families that I have included in the 'Uralo-Siberian' mesh. To see how this hypothesis can be strengthened and deepened through integration with the typological/areal perspective explored in Chapter 3 we must wait until Chapter 8. In the meantime, we need to turn to the archaeological background to see what kind of non-linguistic scenario could possibly account for the purported linguistic links the Uralo-Siberian hypothesis posits.

Notes to Chapter 6

1. Compare for example Chukchi **ɣiliw-** 'be occupied with s.th.' with **ɣiciw-** 'amuse oneself', **məle-** 'break' with **məce-tku-** 'break to pieces', and prefix variants **mel-** 'very' but **mec-** 'fairly' (perhaps also suffix **-cɣən** 'big' corresponding to plain singulative **-lɣən** < ***-lŋən**). Sometimes there is no clear affective meaning, as in lexicalized **wetca-** 'stand' versus **wetla-** 'stand on tip-toes'. As will be further discussed in 8.2, this alternation may reflect an ancient North Pacific Rim trait.

2. The only slender evidence for an original /l'/ (>*/j/?) in Proto-EA lies, in the 'replacive' l-initial affixes like **-li-** 'make' (Aleut **-li-** 'be engaged in, etc.' and/or **-(X)si-** 'make') and **-liR-** 'provide with' (Aleut **-lRi-**, after C **-sXi-**), which lose their initial consonant in contraction with the preceding syllable or fuse with a preceding /t/ as /c/ or /s/ (the process */t/ + /j/ > /c/ or /s/ is a productive rule in Yupik still today). In CK, note, */l/ plus /j/ has gone to /j/ at least in perfect tense forms like 1s **ɣæ- -jɣəm**, the suffix coming from **-l-** plus **-j-** (< ***-i-** 'be', as also in 3s **-linæ**) plus **ɣəm** 'I'. Collinder (1960, 272f.) has at all events parallel formants beginning with /l/ in other Uralic languages (some of which, he states, may have come rather from */ð/). The reconstruction of */l'/ in any US family apart from Uralic is problematical.

3. Note the alternation /l/ ~ /ð/ in such EA sets as ***aðiq** 'sleeve' (Yupik **aliq**, Inuit **a(s)iq**, but Aleut **aðiX** 'lip, edge'), going with Samoyedic **warə** 'edge', and compare such words as **ucəma-** 'make, fashion' in Sirenikski, elsewhere **ulima-**. There is a regular alternation /r/ ~ /c/ [tˢ] in the latter Eskimo language, the former in position between full vowels, the latter next to /ə/, both from */ð/. This may not directly reflect the original */ð/ versus */l/ distinction, but does increase the impression of an affinity of */r/ with both reflexes in EA. The fact that the Sirenikski alternation has been generally viewed as due to the influence of the special affricate female pronunciation of /r/ in Chukchi does not explain why that should be limited to contiguity to /ə/ (the female pronunciation /c/ in Chukchi is potentially possible for any position of /r/ in male speech). In fact the influence may even have gone the other way, the Sirenikski pronunciation of */ð/ having spread - via Chukchis taking local Eskimo wives - to Chukchi as spoken by women. Note that /r/ from */r/ in initial position in Chukchi (as with initial /ŋ/) must be due to elision of an entire initial syllable (a common enough phenomenon in CK languages).

   Unlike */r/, */l/ is reconstructible in initial position for PU and Proto-CK; it appears that initial */l/ (and */l'/), like */j/, has dropped in Proto-EA, as reflected in cases like PC **leval-** (It **avela-**) 'wave', PE **əvə(R)luɣ-** 'flap' (and **əvcuɣ-** 'shake'), CK **lovə-** 'suck breast', PE **əvjaŋ(ŋ)iq** 'breast', and perhaps PU **lupsa** 'moisture', PE **əvtəq** 'juice'.

4. Proto-CK apparently had stress on the penultimate syllable of the stem, whereas Proto-EA had no distinctive word-stress, like Inuit still today; for PU - and Proto-US? - initial stress is reconstructible.

5. In fact comparison with certain EA and CK cognates suggests that in some cases these might have been the original segments in PU if not Proto-US itself: cf. ***uɣ(ə)-/uj(ə)-** and ***puwə-/puɣə-** under 6.2.5. Décsy sees this unstable protophoneme as a velar nasal rather (Décsy 1990, 30), but this seems unlikely, given the many good correspondences for a distinct */ŋ/.

6. According to Sammallahti (1988, 486) */i/ and */ï/ were already neutralized in Proto-FU in the non-first syllable (breaking the vowel harmony regularity), and */ï/ had started moving towards /a/ (as in Finnic) before changing to short /u/ in

Proto-Permic, whereas Proto-FU /a/ was to become Proto-Permic full /u/. One result was that /i/ and /ï/ merged in some words also in the first syllable, rendering /i/ neutral to vowel harmony. In Proto-Samoyed */ï/ went to /ë/ (> Nenets /i/ or /e/, Ng /a/ or /ï/).

7. This may be relatable to the widespread phenomenon of incorporation and the grammaticalization of originally independent morphemes into affixes - and especially circumfixes - that developed in Chukotkan at a later stage.

8. In fact when pharyngeal segments are not lost in Coeur d'Alene there is no dominant vowel harmony - as Bessell puts it (1994, 178), nothing lost = no feature to spread. So it is the loss of a pharyngeal/uvular that probably triggered dominant vowel harmony in CK too. Note that non-final pharyngeal phonemes in Koryak and other CK languages are new (from uvulars) and do not affect harmony conditions.

9. This would suggest that most Tungusic - apart from Nanai - may have lost the distinction by merger again, but this is unlikely in the face of the fact that the uvular/velar distinction is not reconstructible for proto-Tungusic (or any proto-form of Altaic), although it may be significant that (eastern) Even has allophone /q/ corresponding to /k/ in words with 'hard' (dominant) vowels. More likely, as mentioned in Chapter 3, is that the phenomenon there represents substratum or areal influence, either from CK or from Amuric languages related to Nivkh.

10. Vowel harmony has broken down again in eastern Alutor, Kerek, and the intervening coastal form of Koryak, in a coherent coastal strip where Eskimos are known to have been present at least as early as Thule culture times, and this is widely accepted as reflecting Eskimo influence, since the result is a non-alternating three full vowel series as in Eskimo (plus schwa as in Yupik and indeed Proto-EA). This has since spread to Koryak proper, where many original */æ/s have shifted to /a/ rather than /e/ as expected, as is also the case in the Enmylen sub-dialect of Chukchi, next to Eskimo-speaking Sireniki. In Itelmen the system has largely broken down (wholly so in Sedanka acc. Jonathan Bobaljik, pers. comm.), with alternations on verb stems remaining only in connection with a couple of affixes. The original situation has been obscured further by lexicalized vowel lowerings which in the case of a few important affixes give the impression of an original 3-way rather than 2-way dominant/recessive system. Thus the 'antipassive/dummy subject' prefix ***inæ-** has produced irregularly distributed allomorphs **in-** and **an-**, as well as (before clusters) **na-**.

11. Which is itself somewhat uncertain - Janhunen has *PS **ïnəpə** corresponding to this stem, which Sammallahti (1988, 485) derives from PU ***ïna-jppï** (cf. PU **ïna** 'mother-in-law'). Nikolaeva associates non-reduced single intervocalic stops in Yukagir with corresponding geminate stops in PU forms as in Rédei (1988a), so they seem genuine enough. There are more sporadic examples of the reduction of single intervocalic stops (as opposed to geminates or clusters) to the corresponding fricative also in EA (a more regular process in certain Inuit dialects, notably SPI and East Greenlandic). The uncertainty as regards Proto-CK is whether or not all geminates can be explained as assimilatory in origin, but there is a residue where

this is unlikely.

12. In general the correspondences between Uralic and Yukagir vowels is, as mentioned earlier, a complex matter, obscured by assimilation between vowels of adjacent syllables in both directions at different times despite the preponderence of progressive assimilation, i.e. vowel harmony. Note the regressive assimilation associated with Yukagir inchoative **-a-** in combination with a number of common verbs (for example **mada-** 'sit down' from ***mod-** 'sit' plus this suffix). The many-to-many vowel correlations that appear to characterize the situation also typify the comparison of Aleut and Eskimo vowels, so it will probably eventually be clarified. Thus Aleut **tana-X** 'land' goes with PE **nuna** 'id.', **taɣa-** 'alight' goes with PE **taɣi-** 'come', **cuɣu-X** 'sand' goes with PE **ciɣuRaq** 'id.', **uju-X** 'neck' ging with PE **uja(quq)** 'id.', and **uŋut-** 'sit down' goes with PE **iŋət-** 'id.', etc. Nikolaeva points out some of the specific contexts leading to divergence from expected vowel correspondences, e.g. position before /l/, /l'/ and /j/ (where PU */o/ corresponds to Yukagir /e/, for example). There are no good correspondences for PU /ü/ in Yukagir - in PS it went to /i/, whereupon a secondary /ü/ later emerged.

13. There is also some evidence of Proto-US /a/ having sometimes gone to /o/ (via /å/) in Proto-UY, especially following */k/, to judge by such sets as **ka/ko** and **kan(iɣ)** in 6.2.5.

14. Similar 'inexplicable' variations between /a/ and /ï/ are found within and between certain Turkic languages, including Chuvash, Tuvan and Yakut (cf. Serebrennikov & Gadzhieva 1986, 10). Thus Yakut has either **bïhax** or **bahax** 'knife', and either **ïnax** or **anax** 'cow'. Róna-Tas (1988, 753) points out that in certain early Turkic loans in Hungarian a Turkic /a/ appears as /ï/, i.e. different from Hungarian /a/, which is labialized (as it is in PU acc. Janhunen). The pairing of illabial /ï/ with labial /å/ (maximalizing the distinction) would seem natural in a system with incipient labial harmony at least (the case in much Turkic and also Hungarian). Perhaps the phenomenon reflects a Uralic substratum/contact in these varieties of Turkic - note that they all lie in areas that have been adjacent to Uralic languages since early times.

15. As regards nouns, EA 'strong' consonant stems (ending in an original fricative/stop - especially the uvular variety) appear to go with UY schwa/consonant stems, and EA vowel and 'weak' consonant stems (where a singulative marker has been added) with UY full vowel stems. Note the loss of syllable-final fricatives (especially /R/) in many Aleut stems and affixes, as apparently also in UY and CK, and recall what was said above about the relationship between EA strong uvular stems and dominant harmony in CK.

    Sometimes initial /a/ in EA seems to correspond to CK /ə/, as in EA **aməlRaR-**, **aməcu-** '(be) many', PC **əməlRo** 'all' (It **mil**); EA **anəŋaq** 'elder brother (of woman)', PC **əninælRən** 'elder brother'; and perhaps EA **amu-** 'haul up', PC **əm-** (It °**am-**) 'deep'. Here too non-first syllable stress may have caused the reduced vowel, unless an original */ï/ really is involved.

16. Also **huɣinɣi-X** 'confined air (in stomach or bladder)', Notice the particularly close correspondence between participial forms CAY **puɣə-lRia** and C **pəɣə-lʔən** 'floating'. The important words for 'inflated float' here suggest a common knowledge of fishing techniques involving floats at the time of the common proto-language - perhaps referring first to fishing with seine nets suspended from floats, as in the E Aleut meaning (CK **pəɣpəɣ** is a typical reduplicative singulative and unlikely to be a loan from Eskimo, though one can not rule out independent parallel derivations).

17. This could be further related to Y **kökə** 'head' under 6.2.3.

18. Aleut **sulux** 'noise of running water, echo, thunder' goes rather with CSY **suluk** 'sound of wind', probably unrelated.

19. Note also FU **ðäpðä/ðäppä** 'milt' acc. Sammallahti's (Rédei has **läppV/ðäppV**); Nikolaeva cites **ðʾäðʾwä**, the Lapp form, as possibly going with Yukagir **lʾajə** 'spleen'.

20. By loss of first syllable; the singulative (absolutive) is **roro-ŋa** with stem reduplication and a suffix. The dominant vowel may be due to common combination **rotlə-** 'go into sleeping compartment' from ***ro-** or ***ru-** plus dominant ***ðəl-** 'crawl in'. Compare also EA **pura-** 'enter' and PC **-ra-** 'house, yaranga' singulative **rara-ŋa**) - the latter is related to **ræ-** 'enter', the dominant vowel perhaps due to common combination **rajtə-** 'come home' (with dominant **jət-** 'go to').

21. The circumfix is a transitivizer. Note also **omak-aŋ** 'together' **umæk-æt-** 'gather', and Chukchi **umek** 'crowd' acc. Bogoras, comparable perhaps with PS **om-** 'come together' from **o-** 'one' acc. Janhunen, though the /k/ in CK is problematical.

22. Note especially Aleut deictic/interjectional form **wa-j**, with the same 'predicative' suffix on demonstrative stems as in Yupik, thus Koniag AY **waa-i** 'there you are'.

23. Western I has **qtXən** (also **tXən** acc. Bobaljik), but there is some variation with initial velar/uvular stops in initial clusters.

24. And note I **eke-cX** 'girl', also PE **a(a)kaq** 'older female relative'.

25. cf. **mamə-** 'heal, close over', transitive **mamət-**.

26. Note also perhaps PU **enä** 'big' (Sam. FU **enä/ inä** 'big'), also PS **inä** 'elder brother', which, however, may be a loan from Turkic **ini** 'younger brother' acc. Rónas-Tas (1988, 743).

27. I write ordinary /a/ for Sammallahti's (and Janhunen's) rounded back /å/ (whose labiality is uncertain), and in general employ the phonemic symbols compatible with my own proto-phoneme inventory, as discussed in 6.1. Sammallahti does not distinguish */c/ and */c'/ at the PU level - there is better evidence for this

contrast in Yukagir than in Uralic, in fact, although Yukagir has merged the two in initial position. EA-UY correlates that support the distinction between */t'/ and */c/ include PE **tunu** 'back' (and perhaps **tunnuq** 'back fat of caribou' and **tun-tu** 'caribou' itself, with a suffix meaning 'have a big'), A **cunuX** 'back of neck', FU **cäncä** 'back'; and PE **tutə-** 'step', PU **canca-/caca-** 'go, step'. These could reflect an original */t'/. Compare as an example of original */c/ FU **cukkV** (with back vowel) 'clump of wood', PE **cukaR** 'post, support'. Unfortunately there are no certain reconstructions with these phonemes that also involve PU - Sammallahti has two PU stems with initial */c/, but these are not reconstructible for Proto-US.

28. But a velar remaining from a cluster reduction does not necessarily go to the corresponding uvular in a back environment. As Décsy points out (1990, 37f.), there were numerous couplets in PU with respectively front and back vowels - if these are allowed for (i.e. that only the one or the other member of such couplets may have survived respectively in the modern Uralic and EA languages) the number of potential cognates with EA increases (either /q/ or /k/ corresponding to PU /k/ next to any vowel). Thus, for example, both **kere** and **kore** are reconstructible for PU 'bark, rind', and **kec'ä** or **kac'a** for PU 'end, point'.

29. Janhunen distinguishes PS **t^{l}ənt^{l}V-** 'run, trot' and **t^{l}ant^{l}ə-** 'tread, step'; the former (< ***t'unt'a-** with regular 1st syllable */u/ > /ə/ before following back V?) could be the more direct correlate of the PE form despite the meaning. Perhaps two stems have become contaminated here. Janhunen's symbol 't^{l}' indicates a segment uncertain as to */t/ or */c/.

30. But Sammallahti has 'rise'. Note also Yukagir **kel-** 'come', apparently going with PU **kulke-** 'go by land or water' (Samm. 'run'). There may be a link between one of these sets and PU **kälV** below and/or PE **kalət-** 'tow, drag'.

31. Also Ng **kunie** 'which', **kanəmtuo** 'how many', Se **kumen** 'how many', Ne **xan'ana** 'where', En **kune** 'when', Y **konto** 'how', **kanta** 'where', **kant(i)-** 'which', **kam-lal** 'how many', Eskimo **qavci(t)** 'how many', etc. Observe the remarkable parallel between WG **qanuq it-tuq** 'what kind of' (with **it-** < ***əl-** 'be' in participial form) and Nganasan **kuni?a ei-tua** 'id.' (with **ei-/i-**from ***ä-j-** 'be' in participial form). The **-na** in A **qana-** (and PI **qa-n(uq)** and Ng **ku-nie**) is probably the same as demonstrative **na/nä** under *n- below.

32. Perhaps also PE nominal suffix **-nku-t** (dual **-nku-k**) 'and companion(s)/ family', where the **-n-** could reflect the original genitive. Uralic **kunta** may also function as a collective, as in Finnish **maa-kunta** 'province' from **maa** 'land'. Note also Ostyak ethnonym **Xanti**.

33. And transitive derivative Y **kon-tə-** 'take', going with PU **kan-ta-** 'carry'. The gloss of PU **kanï-** should rather be 'go away' acc. Janhunen (pers. comm.).

34. Also **s'ale-**; compare Y **s'öl(ɣ)-** 'break (intr.)'.

35. Lapp and Nenets only. The /ɬ/ in the Eskimo form may be by contamination with another **caɬiɣ-** meaning 'sweep, clean'.

36. But also Y **c'aqə-** 'freeze' (as noun 'frozen fish') - cf. PI **ciRmiq** 'ice formed on ground' if from ***ciq(ə)miq**.

37. This could be from ***coɣar** - cf. Collinder (1960, 77).

38. Actually only Balto-Finnic.

39. Perhaps also CK **macve** 'chest'.

40. As in T **əl-meli-n'ə-** 'calm, waveless (sea)' with negative prefix **əl-**. The Inuit form is probably related to PE **maɬəɣ-** 'press up against' - the /ɬ/ is unexplained, but note also **maliɣ-** 'follow', with which there has been contamination in Inuit at least.

41. Janhunen has PS **nëkə-/nïkə-** 'bow, nod', so perhaps from ***nïkV-** rather. Another problematical comparison involving initial */n'/ or */n/ is that between PS **nëkV** 'power' (Mikola 1988, 225) and PE **n(')ukəɣ** 'muscle, strength' - King Island **juɣik** 'id.' (and perhaps Sir **jukənRuR-** 'boast') on the Eskimo side suggest the palatal.

42. The EA forms have been integrated into a system of contrasting demonstrative stems where an open vowel iconically indicates an extended object and a narrow vowel a restricted one.

43. The Yupik form **aci** may go with Inuit **at-cik-** 'be situated further down' with PE suffix **-ðiɣ-** 'be situated in a direction; compare PI **qutcik-** 'be situated higher up' with locational stem **qulə-** 'above' plus the same suffix (Alutiiq Yupik **qussiɣ-**). The possible suffix in PE **at(ə)-** 'below' is PE **-tə** 'area in a direction', attached to demonstrative and locational stems (in turn perhaps relatable to old Uralic locative *-t, as in Sinor 1988, 716). PE **qutə** 'steep shore' (CSY 'land seen from sea', on the American side 'Chukchi peninsula') may be an exact parallel, since it apparently derives from **qulə-** plus **-tə**. This and the PS suggest an original ***alə/ïlə**. Note further the 'patch on sole' words in CK and EA under *a- in 6.2.1, which could be related.

44. Also T Yukagir **en'e** 'mother' (used as an affectionate term of address to a baby (K) or young girl or woman by an older man (T)), and/or PU **anV(ppV)/ïna(ppV)** 'mother-in-law', containing **appe/ïppï** below (Samm. **ïna**).

45. Also probably PS **äŋ** 'mouth', although Sammallahti does not include it with the FU, presumably because of the irregular vowel correspondence (perhaps another of Décsy's front/back vowel couplets are involved here).

46. Also perhaps PS **jatə-** of the same meaning, though the vowel correspondence is irregular.

47. But note also FU **päjwä** 'day(light), sun, warmth', going apparently with Y **pojə** 'tan'. These could all be related to Proto-Tungusic **pöjö-** 'boil (intr.)'.

48. In T also 'paw'. Goes with PS **ərmə** 'north' in the sense 'down' according to Nikolaevna.

49. The initial /r/ in FU here may be secondary (from /l/, preserved in Yukagir). Sammallahti does not have word-initial /r/ in his PU reconstructions, only in Finno-Permic.

50. This phoneme was originally set up to cover cases where T has /a/ corresponding to K /o/, but Nikolaeva now sees this as reflecting a more or less regular development in the former before labial consonants and probably /ɣ/ (Nikolaeva 1992, 206), but also extending to some other cases. Note that */u/ had everywhere gone to /o/ in Old Yukagir, whereas */ü/ had gone to /u/ in the complex early shift mentioned in 2.3. Since the relationship between these reconstructed segments and the corresponding vowel phonemes reconstructed for PU do not correspond in any simple fashion (in fact PY /ü/ corresponds more often than not to PU /u/ and there are very few if any satisfactory cognates involving PU /ü/ at all) one is forced to envisage either that Proto-US */u/ changed to /ü/ in PY, but by Old Yukagir times changed back to /u/ after the original */u/ had already passed on to /o/, or that PU /u/ comes from Proto-US */ü/ (note that the status of /ü/ in PU itself has been the subject of debate). In her PY reconstructions Nikolaeva writes /u/ rather than /ü/ by convention and in this I follow her here.

51. Note also perhaps EA **iqaɬuɣ** 'fish, salmon', if there was early influence there from **iqjaɣ** 'fish hook'. The Malimiut and Nunamiut Inupiaq form **qaluk** 'fish'with loss of initial /i/ is probably coincidental, however.

52. cf. also FP **kira-** 'beat, hack', PS **kərV** 'knife' but '**këra-** 'flense', and PE **kiliR-** 'cut, wound' if the Uralic form reflects one of Décsy's vowel harmony couplets in PU.

53. Rédei also has PU **lapV** 'oar, paddle' (= PS **ləpV** in Janhunen 1977 - also 'steering oar, rudder' in Nenets), and FU **lVppV/ leppV** 'blade, sheet'.

54. The relationship between this and T **tadī-** 'give' (<***tant-**) and PE **tunə-** 'give' is unclear.

55. And note Aleut **laɣi-X** 'goose'.

56. Perhaps also FU **nVn'c'V**, Y **n'an'(c'ə)-** 'big', but cf. also PI **na(ž)aq** 'stomach'

57. And note Polar Eskimo **puR-vik** 'seat of trousers' with **-vik** 'place (of)'.

58. cf. **jəp-** 'go via/across', source of the PC vialis case.

59. Nikolaeva relates this further to FU **soja** 'place behind' as in Zyrian **saj** (also Fi **suoja** 'cover, hiding place'), but Rédei and Sammallahti only have this in the sense 'sleeve'.

60. And compare perhaps Eskimo affix **-tuR-** 'eat, use'.

61. Note also eastern Ni **plaŋq** 'leaf' in Austerlitz (1990, 18) - compare Itelmen **pəla(pəl)** 'leaf' mentioned in 6.2.1. As isolated examples of possibly related morphological markers note the 'singulative' (in Ni noun classifier/formant) **-ŋa** mentioned in 4.1.1, and the PC supine **-nvə(ŋ)** 'in order to -' (related to **-(ja)nvə** 'place of -ing' and Itelmen case-marked supine **-no-k(e))**, where the vowel is dominant and the final nasal retained in Koryak is a dative/allative case marker. This could go with Nivkh supine - **nəftox**, where **-tox** is the allative case marker and **-f-** is 'place of -ing' (**-nə-** is a future marker).

62. And perhaps PC **əm-**, I **°am-** 'deep (water)'.

63. The latter form, reflected in E **anəR-**, may contain a continuative suffix (PE **-VR**), though there could also be two distinct stems involved here.

64. As discussed in 5.4, there may be a link here both to ***e(w)-/o(w)-** 'be' (both variants reflected in PS, the latter also in EA and Y and perhaps also in the first half of FU **wole-** 'be') and to ***le-** 'become', though the relationship is obscure. The /t/-final forms in Eskimo may be due to position before a following stop (e.g. that of participial **-tuq**) - compare **at(ə)-** under ***al(a)** above.

65. The well-known correspondence between Uralic and Altaic question words (also as regards **ki** below) supports the original form ***ka** here, with the vowel reflected in EA.

66. Perhaps also PU **kälV** 'bay, swampy lake', I **ku ɬX** 'tundra', and PY **kilɣaq** 'wilderness'.

67. And perhaps A **kala-** 'string (beads or fish on line)'.

68. And Nenets **m'ud** 'caravan', **m'ud-tä-** 'nomadize, roam'. Janhunen sees the ultimate source of the Samoyedic forms in ***mü** 'interior', though this does not explain the source of the /ə/ (< */ɣ/). The Sir (and some Siberian Yupik) forms with specific meanings relating to reindeer caravans must be relatively late loans from Chukchi.

69. But note also FU? **putV** 'gut, large intestine' (Lapp and Vogul only) in Rédei, also **puckï** 'tube' in Samm. (Rédei has **puc'kV** 'hollow stalk' but **puckV** 'inside'), PS **pəsə** 'slit' (Nenets 'vulva'), and PE **putu** 'hole' (from ***put'u**?), some or all of which may belong here.

70. Janhunen has PS **pu-/puəj-** 'blow'(the diphthong is from */uɣ/). Note also Y **puk(V)-** 'swell'(and **puki-l** 'crop, bubble' - compare PE **puv-jaR** 'crop, craw', **puv-laɣ** 'bubble'), although Nikolaeva (1988a, 180) sees this as a loan from Tungusic - this is rather unlikely in the light of PC **pəktə-** 'swell (from overeating)'. PE **puɣə-** 'float', A **huɣinɣi-X** 'confined air (in stomach or bladder)', PC **pəɣ-at-**, I **pvat-** 'float' are probably all related, possibly also the 'behind' words in 6.2.4. There may

have been two separate proto-stems here that became contaminated at an early stage.

71. But apparently not Y **sö ɣ-** 'go in' acc. Nikolaeva.

72. Perhaps also Y **c'uŋ-ðə-** 'think'.

73. This set may be related to ***s'ap(p)ə-** 'hack' above - in fact there appears to be contamination between the two.

74. If K, T Yukagir **cen-dej-** 'fly up' (also T **t'eŋure-** acc. Angere) belongs here, then possibly from ***t'eŋ(ä)-** rather (though there is a problem with the PS).

75. The FU form ***tul-ka** is a derivative acc. Janhunen (pers. comm.). The irregular Finnish form **sulka** remains to be explained (< ***tilka**?) - cf. also FU **šilkV-/šülkV-** 'fly'. There may be metathesis in Eskimo; Sammallahti (1988, 511) suggests metathesis as the source of Ob-Ugric **togl** 'feather' (<Ugric ***tulka**).

76. Compare also PS **tujt** 'fat (of reindeer)' - Nganasan **cü?** - and perhaps PI **tuniRžuk** 'breastbone', A **cuniX** 'backbone'.

77. The numeral systems of the region are all basically decimal, often with the 'five' and 'ten' words related to 'hand', except for EA and CK, where this is extended to a vigesimal system by reference to the feet, 'twenty' being 'just one human being' in Proto-Eskimo or 'that which pertains to a human being' in Chukotkan and at least extinct eastern Itelmen (there are also vestiges of this system in western Aleut). There are two major variants within the finger-counting system, which may also have typological/areal significance. These are the 'paired side' system, where two and four go together (the latter being 'two on each side') and three goes with six ('three on each side', similarly with four and eight), and the 'above five' system, where six is historically 'five (plus) one', seven 'five (plus) two', etc. The former is typical of most Athabaskan (where 'five' is related to 'side') and Haida, Nivkh and (in part at least) Yukagir, the latter of CK, EA and apparently Tlingit, but also Lower Koyukon (which borders on Eskimo). Eskimo (but not Aleut) differs from the second type of sub-system by having a special term for 'six' (historically 'crossing over to the side of the (other) hand'), to which 'two', etc., are added to produce 'seven', etc.

As regards colours, note the constrast between Eskimo languages, where 'red', 'yellow', 'green' and/or 'blue' are generally distinguished each by a 'basic' term, and Northern Athabaskan, in which 'green' is not usually a 'basic' term but 'grey' is (different again from the typical Northwest Coast conflation of 'yellow' and 'green' in one basic term - in Ts, W, much Sa and some Haida). There may be areal significance, however, in the prevalent conflation of (dark) 'blue' and 'green' found immediately around the Bering Sea (also in most Canadian Inuktitut and, probably by chance, in much OP), namely in Itelmen, Koryak, Aleut, Siberian Yupik and Seward Peninsula Inupiaq; Proto-Eskimo may have distinguished 'dark blue (like a ripe berry)' and 'dark green (like gall)'. Chukchi has the Koryak word (based on a stem meaning 'leaf', as in Itelmen) in the sense 'green, light blue', but

also a 'dark blue' word based on the stem meaning 'gall', parallel to a similar derivative in Siberian Yupik meaning 'blue or green' (in other Eskimo apart from Seward Peninsula only 'green'). Also Ahtna Athabaskan has a '(dark) green/blue' term based on the stem for 'gall' (Koyukon has a basic 'dark' term that covers dark blue of ripe berries, but 'green' is derived - 'like grass').

78. Note especially Tundra Yukagir **ile(ŋ)** 'domesticated reindeer', which may be from Tungusic (and common Altaic) **ili** 'reindeer' acc. Nikolaeva (1988a, 253). According to her this has become entangled with another, native stem **ilwi-** 'put (reindeer) to graze', though how exactly either of these relates to Chukchi **əlwəlu** 'wild rendeer' is not clear - perhaps this represents the pre-Tungus word for the wild animal in the region prior to domestication, although ultimately they may all share a common source. Proto-Y **tolou** 'wild reindeer' seems to go with Even **tola-** as in **tolan karbe** 'male wild reindeer over 6 years old', but the first part could reflect the same source as PS **tëə** 'domestic reindeer' (PU **tewä** 'reindeer, elk'), a known 'wandering word' in Siberia. Nikolaeva is less convinced that Nenets **jil'ebcï?** 'wild reindeer' is related to the T Yukagir word (the name derives apparently from **jil'e-** 'live', PS **ilä-**), but this may yet prove to be the case if both these terms (and perhaps also the Chukchi) are related to PU **elä-** 'live' (itself of Proto-US date), whether as cognates or as loans.

79. Of particular interest are the Russian loan-words in Alaskan Eskimo (reflecting the early Russian presence there) as opposed to the English equivalents in Siberian Eskimo (reflecting the activities of English-speaking whalers on the Asian side), thus CAY **ku(u)skaq** 'cat' and **ma(a)sɬaq** 'butter' from the Russian, but SY **kiti** and **para** 'id.' from the English. Mention should also be made of the handful of Old Norse loans into Greenlandic Eskimo that survived the disappearance of the Norsemen from Greenland, in particular ethnonym **kalaaliq** 'Greenlander' (cf. Icelandic **skrælingi** 'savage'). A few words have gone the other way, of course, such as 'kayak' from Eskimo and 'parka' from Samoyedic. This is much more marked in local 'bush' varieties of English and Russian in the North, for example the Russian dialect once spoken on the Kolyma river amongst Old Settlers, replete with loan words from Even, Yukagir and Chukchi, as recorded by Bogoras (1901) at the end of the last century. Although lexical borrowing from Uralo-Siberian languages into Russian has not been very extensive there is evidence of considerable substratum interference from Finno-Ugric within Russian in particular and indeed within Slavic (also Baltic) as a whole (see Thomason & Kaufman 1988, 238ff).

80. Although the words for most marine mammals are indeed different in the two branches - such terms, note, may be subject to taboo replacement, as has been the case in East Greenlandic in recent times.

81. Many of these correspond to Eskimo 'sentential' affixes, which they have replaced. The large number of such particles in Chukchi and Koryak appear to have expanded from a relatively restricted stock of simple adverbials.

82. This could have come directly from Inuit **tuutlik** (CSY **turiik**, Sir **tulix**).

83. If the following correlation (suggested by Nikolaeva 1988a, 273 as a loan and in Fortescue 1981 as a cognate) is correct, one 'basic' Tungusic cognate may have spread to a remarkable extent through the region, namely Proto-Tungusic ***päku-** 'hot'. Compare Yukagir **pu ɣu-** 'hot, summer', Nganasan **fekutea**, Eskimo **puR-** 'hot' (Sir **pu ɬiX** 'summer'), A **huR-na-** 'warm', Kerek **pəə-lRan** 'sun' (otherwise isolated in CK). This is the kind of case where it is difficult to distinguish loans from cognates. If it is a borrowing from Tungusic, it is a very old one indeed.

84. A word of wide areal significance, thus also Chukotkan **nəmnəm** 'village, dwelling', and Even **nimŋen** 'hut, earth-covered tent frame' as well as **nimer** 'neighbour'.

85. Also ethnonym 'Omok' used by various Yukagir groups as discussed by Tailleur (1959b, 79). Note also Mongolian **omug/ovug** 'tribe'.

7 Who could have spoken Proto-Uralo-Siberian - and where?

It is now time to present the archaeological scenario that seems best to account for the linguistic facts that we have addressed up until this point. Although a certain degree of uncertainty is inevitable (the absolute dating of linguistic divergence being wishful thinking at the time depths we are concerned with), the scenario is consistent with the archaeological sources cited. Note that the combined linguistic and archaeological picture stands or falls as a whole: if the languages I call Uralo-Siberian are indeed genetically related (either as a 'stock' or as a 'mesh') then the archaeological horizon containing their spread must be younger than Paleolithic Beringia but no later than the Siberian Mesolithic for ancestral Uralic and Eskimo speakers ever to have been in close enough vicinity to one another. Similarly, if the archaeologists are right about the movements of peoples out of central northern Eurasia since the early Holocene, the present distribution of languages must somehow - however indirectly - reflect what is known of these movements, since languages do not arise ex nihilo before the advent of the people destined to speak them. If somehow it could be proven, for example, that ancestral speakers of Eskimo-Aleut lived on the Beringian Land Bridge, or that all speakers of Proto-Uralic lived in Europe rather than east of the Urals prior to the Siberian Mesolithic, the whole scenario would have to be radically revised. Alas, it is unlikely (short of time travel) that such direct (dis)confirmation will ever be forthcoming. Internal consistency, however, can be demanded right away.

7.1. Preliminaries: earlier theories of origins

7.1.1. The Eskimos and Aleuts

Before plunging into the archaeological synthesis, I need to address certain hypotheses that have been proposed in the past as to the origins of the peoples at the geographical extremes of the linguistic area covered by the Uralo-Siberian language stock. Some of them are now generally rejected but others are still alive, and some readers may still find it hard to reconcile my proposed scenario with such accepted ideas - despite their linguistic unlikeliness. Unfortunately it is not really possible, given the great difference in physical environment lived in by Eskimos, Aleuts and Chukotkans on the one hand and the various Uralic peoples on the other, to make the scenario more plausible by a straightforward application of 'linguistic paleontology' based on plant and animal names and the actual distribution of species, which has been applied to Uralic languages with some success (cf. Hajdú 1975, 27f.). Yukagir and Samoyedic still straddle the tundra and the taiga ecological zones, and there are considerable differences in vocabulary between the varieties spoken in these different ecological niches (and, for that matter, in the southern mountains in the case of Samoyedic until recently). If the common ancestor of all these languages was spoken in, say, the upper Yenisei region, where none of its descendents are now found, it is a priori unlikely that once common plant and animal names should have been preserved - at least in their original meanings - in the high Arctic, where the number of plant species is greatly reduced and the fauna (other than the reindeer[1]) is largely specific to high latitudes.

As regards the origin of the Eskimo-Aleuts, although it was recognized from the start

that the Eskimos and Aleuts ultimately came from Asia like all North American natives (e.g. by explorer Martin Frobisher, who guessed already in 1576 that the Eskimos were related to the Tatars and Samoyeds of Asia), their relatively late arrival in the New World compared to the American Indians took longer to establish[2]. In fact the Danish ethnographer Steensby's hypothesis of the inland Canadian origin of the Eskimos (Steensby 1917) was eagerly embraced by Kai Birket-Smith and Knud Rasmussen in their influential 5th Thule Expedition reports. The so-called Caribou Eskimos of the Barren Lands west of Hudson Bay were seen as representing the most 'primitive' stage in the genesis of the Eskimos when, emerging from the forests of the south, they had not yet reached the arctic coasts and adapted to a maritime hunting way of life. Only much later did it become recognized that these Eskimos had only recently turned to an inland way of life during a cooling period which disadvantaged the hunting of sea mammals (cf. Csonka 1995, 70) - a recurring pattern in the Arctic discussed by Krupnik (1993). Also Thalbitzer (1904, 222ff) saw the border between the 'eastern' and 'western' Eskimos at the Mackenzie Delta, thereby drawing the Eskimo 'homeland' further eastward than we would today (the principal linguistic divide is in fact on the south side of Seward Peninsula, between the Inuit and Yupik languages).

Another outmoded (and related) theory, this time attributable to Franz Boas and others associated with the Jesup North Pacific Expedition at the beginning of this century, was that of the 'Eskimo Wedge' which supposedly intruded from Canada, breaking up a previous cultural and perhaps even linguistic continuum across the North Pacific Rim by separating the Chukotkans from the American Indians. The Chukotkan Paleo-Siberians/Paleo-Asiatics were assumed to represent an earlier reflux from America back into Asia. Contrast this with the view expressed in the present book that the 'Americanoid' elements on Chukotka and Kamchatka are the result of a (pre-)Na-Dene and/or 'Mosan' substratum. Today we know that the Paleo-Siberian Chukotkans are linguistically - and in most other respects - closer to the Eskimo-Aleuts than to any Indian group.

The truth of the matter is that little was known of the Alaskan Eskimo and Aleut languages at the time, nor of the archaeology of Alaska and Chukotka. This picture was already seriously undermined by Collins' work in the 1930s, which unearthed the neo-Eskimo cultures of St. Lawrence Island (Collins 1937), and had to be definitively abandoned with Giddings' discovery of the Denbeigh Flint Complex (Giddings 1964) - only slightly preceding the earliest pre-Dorset culture on Greenland. This cultural horizon - including the somewhat earlier proto-Denbeigh phase at Onion Portage of ca. 2200 BC - is still held by probably the majority of arctic archaeologists to represent the earliest presence of Eskimos (if not also Aleuts) in North America, although doubt has recently been cast on the direct association of the Arctic Small Tool people of Cape Denbeigh with the Eskimos by Dumond (1987, 51). In his earlier book this same writer pointed out 'a distant counterpart' (one with pottery) of the Cape Denbeigh finds in Siberia, specifically at the neolithic Bel'kachi site on the Aldan River, a little upstream from Dyuktai Cave (Dumond 1977, 92).

As regards the Aleuts, the concensus view amongst archaeologists - though seriously challenged today (again see Dumond 1987, 49) - has been that there is continuity between the earliest population of the Aleutian islands (as at the Anangula site dated to 8,000 years ago) and the modern Aleuts. Whether the Aleuts slightly preceded the Eskimos into the New World (as Dumond now proposes) or split from them in southwest Alaska, the linguistic closeness of Eskimo and Aleut now established would definitely

seem to preclude a time depth between the two branches of the family anything like as great as that between the people responsible for the Anangula and the Cape Denbeigh sites. Language moves more rapidly than genes, and there is nothing inconsistent in the idea that ethnically the Anangulans and the modern Aleuts should have much in common although their languages could have been quite unrelated. As I have stressed repeatedly, people may shift language in the Arctic and sub-Arctic very rapidly indeed, when seen from an archaeological perspective. For a different viewpoint (closer to Dumond's earlier position) see McGhee (1988), who sees EA speakers already in place on the Pacific coast of Alaska in late Beringian (Paleo-Arctic) times and expanding northwards from this relatively rich subsistence environment some time after the arrival of AST people from Asia in the north (presumably speaking some unrelated Paleo-Siberian language). Unlike Dumond's (1987) scenario, McGhee's does not involve a shift of language (to Eskimo) or a major population movement in southern Alaska during AST times.

The scenario to be sketched in 7.2, although it will stress the Siberian source of the Eskimo-Aleut language family, is not incompatible with the position taken by most archaeologists today (at least those outside of Russia) that the original Eskimo 'homeland' was somewhere in western Alaska, no further north than Seward Peninsula (whether one associates this with the AST people themselves or with the ensuing Norton stage). Certainly there is good evidence for a return back into Chukotka of Eskimos around the time of the appearance of the Neo-Eskimo cultures (especially pronounced during the Punuk phase). A number of ingredients entered into the 'ethnogenesis' of the Eskimo-Aleuts, including cultural and technological elements derived from neighbours to the southeast within Alaska and from the southwest within Asia, not to mention remnant 'Beringian' groups that they probably absorbed. There is evidence of sea-mammal hunting people on the northwest American coast well before the definite appearance of Eskimo-Aleuts in the region, at least since 5000 BC (including probably the Ocean Bay people further discussed in 7.2), albeit associated with somewhat different hunting methods and equipment. Elements like the use of oil lamps and slate harpoon tips can specifically have been borrowed from these people by EA speakers further north. It is my principal contention in this chapter, however, that the language as such was introduced by people from deep within Siberia and at a time long after the disappearance of the Land Bridge, as the whole tenor of this book so far has implied.

7.1.2. The Finno-Ugrians

One essential thread that needs to be followed up in order to tie in the origins of the Eskimo-Aleut languages with those spoken all the way to the Baltic and North Seas is the source of the Uralic languages themselves: how on earth could speakers of these far-flung languages once have lived in close proximity to one another? All that is known with reasonable certitude is that a sizeable part of the ancestors of the easternmost Uralians, the Samoyeds, moved north towards the Taymyr peninsula from the upper Yenisei/Sayan region east of Lake Baykal at some stage, probably in a series of waves during the first millennium A.D. (cf. Krupnik 1993, 205, also Levin and Potapov 1964, 672). Okladnikov (1964, 91) sees the Ob-Ugrians as preceding the Selkups north in the 9th to 10th century - both were eventually to settle along the Yenisei and Ob river systems as sedentary fishermen/hunters (apart from the northernmost nomadic groups of Selkups). They may have learnt techniques of domestication from cattle and horse breeders further south

which they applied to the wild reindeer, parallel to the Tungusic people further east (note that the domesticated reindeer has been utilized in the Sayan foothills by both Tuvan Turkic and remnant southern Samoyedic groups for many centuries). In doing so, they appear to have absorbed inland-oriented population groups, either of earlier coastal dwellers returning inland during the 'Little Ice Age' (acc. Krupnik 1993, 208) or of Yukagir groups already in the region (cf. Dolgikh 1962, 288). By the time of contact with Russians as they expanded into Siberia, at all events, the northern Samoyeds were living a way of life very similar to that of the reindeer-breeding Chukchi, far to the east, and to have been organized similarly into patrilineal, exogamic clans, as was until recent times typical of northern Siberia (also the Siberian - but not other - Eskimos). Perhaps the Saami (Lapps) represent - as has been suggested in the past - a still earlier northern population that shifted at an early stage to a Uralic language[3].

The story of the other Finnic people is of a quite different nature, as they gradually took up agriculture from their new neighbours when they moved into Europe. Only in the southeast Finno-Volgic dialects, where there is clear lexical evidence of contact with the Chuvash-speaking Volga-Bulgarian empire of the 7th to 8th century, was the influence of the steppe felt strongly. The Ugrians, on the other hand, adopted horse breeding from other steppe people, the Hungarians eventually moving south to take their chances on the steppe while their Ob-Ugric relatives moved north and eventually abandoned horse breeding. Décsy estimates that this split occurred about 1500 BC (Décsy 1990, 13). The Hungarians, after entering alliences with various Turkic groups, ended up in their present position in the 10th century AD as the most southwesterly of Uralic-speaking people.

The homeland of the Uralians - at least of the Finno-Ugrians - is commonly considered to be the area straddling or immediately to the west of the central and southern Urals, although Castrén already in the middle of the last century proposed a Sayan homeland (see Cheboksarov 1962, 208). This theory became discredited along with Castren's theory of the common source of Uralic and Altaic languages. For more recent support of (as well as opposition to) the hypothesis of the Sayan homeland of the Samoyeds see the references in Tereščenko (1979, 6). The case for a more nuanced picture of a trans-Uralian homeland for the Uralic family has been put by Hajdú (e.g. in Hajdú 1964), who sees it as lying somewhere in western Siberia (between the middle Ob and the Urals), roughly between the 6th and 4th millenia BC. The centre of gravity of Finno-Ugric, at a later period, he associates directly with the Kama-Oka culture of the western, European flank of the Urals. It should be pointed out that Hajdú, like most European Uralicists, hesitates to relate the source of the Finno-Ugric languages with the Mongoloid as opposed to the Europoid element in the ethnic make up of their speakers, preferring to see the Siberians - i.e. Samoyeds - switching to a language already present on the European side of the Urals. From the deeper time perspective this book is concerned with, such a scenario does not make much linguistic sense. A different picture appears to prevail among Russian archaeologists - as reported by Xelimskij (1988:57ff). While agreeing broadly with Hajdú's position that the Uralic 'homeland' was somewhere in western Siberia, their investigations point rather towards early related cultures as far east as the upper Yenisei, and to Mongoloid ethnic affinities for the family. Linguistic 'evidence' such as the common FU words for 'honey bee' and 'honey' (respectively ***meti** and ***mekši** respectively) adduced in these arguments seem irrelevant - even if not loans from Indo-European they are only attested in the Fino-Ugric branch of the family (which is not surprising since the objects themselves apparently are not native to Siberia). Even Hajdú interprets the deep split of the Ob-Ugrians into two exogamously intermarrying

fraternities, the 'mos' and the 'por', in this light, the first representing the dominant Europoid element, the second the deprecated Mongoloid element. The 'por' is seen as reflecting a wave of westward moving Siberians switching to Finno-Ugrian. Certainly there is evidence of considerable Samoyedic-Ugrian bilingualism along the Ob, but this would seem to belong to a later period of contact, specifically with Selkups. One cannot use both bilingualism and language shift in an area to explain the same phenomenon when the time difference between its earliest and latest stages covers many thousand years (the difference between the estimated Samoyed-Finno-Ugric split and recent bilingualism on the Ob). That later Samoyedic-speaking groups moved in from the east and mingled with the Ob-Ugrians is of course easy to envisage, and no one would want to argue with the fact that the European element in the ethnic make-up of modern Uralic people far outweighs the Siberian in sheer demographic terms (compare the population figures given in 1.3).

Most commentators agree, on the other hand, that the northern Samoyeds must have moved north from the upper Yenisei region (whatever their ultimate origin) at a relatively late stage of their pre-history - the middle of the first millennium AD according to Xelimskij (1988, 46), who estimates using glottochronological methods that the break-up of Proto-Samoyedic occurred about 2,000 years ago. The more deeply fragmented nature of the southern Samoyedic languages he relates to an abrupt upheaval at that time, perhaps through intrusions from the south, contrasting this with the continuum-like spread typifying the northern group (like much of Finno-Ugric), which could reflect a more gradual expansion.

According to Cheboksarov (op. cit., 211f.) the earliest appearance of Mongoloid people in the Urals (associated with the Shigir culture and presumably bearing the ancestral Uralic language) was about 6,000 years ago or so; movement of speakers of the present FU languages of the area into the cis-Kama region was completed only a few centuries BC, long after Indo-European nomads had pushed north into the central Volga area[4]. One should probably envisage a broad swathe of related languages across the southern and central taiga region between the Urals and the Sayan at some time before 4000 BC, i.e. roughly contemporaneous with Proto-Indo-European, at the beginning of the neolithic; Okladnikov (1964, 57) speaks in this connection of an interconnected series of cultures reaching from the Yenisei to the Urals (including the Isakova culture of the Angara valley, between the Yenisei and Lake Baykal, and Shigir in the Urals). At this sort of time depth, involving small mobile groups of people, it would seem at any rate more realistic to view linguistic relations in terms of an interactive mesh over fluid boundaries (with individual languages possibly integrating multiple ingredient sources) rather than in terms of a clear-cut stammbaum of the kind more appropriate for describing agricultural Europe.

Décsy (1990, 12) estimates that the Finno-Ugrians and the Samoyeds split about 4000 BC (as does Sammallahti) and that northern and southern Samoyedic did so some time after 500 BC, but such figures should be taken extremely liberally. Sammollahti (1988, 480) relates the first split to early neolithic times when new areal patterns of communication arose under pressure from developments further south; this would, as he puts it, have disrupted the earlier lifestyle of small exogamic groups of hunters and fishers of the Mesolithic in frequent contact with other such groups as they wandered through the same vast ecological zone. It was this social reality that he sees as underlying the considerable homogenity of culture and presumably also of language in Uralic Siberia before intrusions from the south upset it. One of the results of this disruption would have

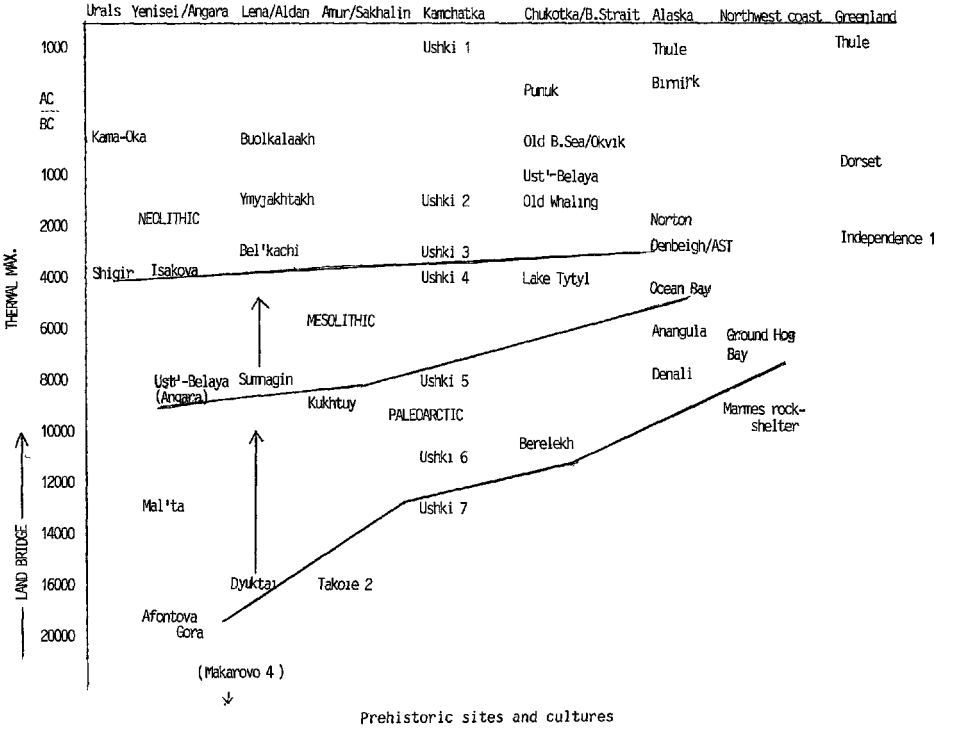
been the splitting and displacement of the Samoyeds of the upper Yenisei region. The period this scenario fits in best with, as far as I can judge, is the Afanasievan[5]. The PU mesh of languages would represent a westernmost flank of a still broader mesh encompassing the Uralic, EA, CK and Yukagir proto-languages, whose common ancestral form (if it ever existed as such) could have been spoken - at a guess - some 2,000 years earlier, i.e. no later than 6000 BC and probably quite a bit before that, as I have suggested earlier. That the speakers of this related mesh of languages could have been mesolithic hunters and fishermen living along the great interconnected waterways of Siberia (like the Sumnagin people on the Aldan and similar 'late paleolithic' people of the Angara region) is not implausible. Before them, at all events, went big game hunters of the Paleolithic and after them arrived various Altaic-speaking pastoralist people from the steppelands of central Asia[6].

7.2. An archaeological scenario: from mesolithic hunters and fishermen to modern reindeer breeders and sea mammal hunters

In turning now to the archaeological and anthropological evidence I shall attempt to sketch a plausible scenario for the genesis and spread in space and time of 'Proto-Uralo-Siberian', the hypothetical ancestor of most of the languages of Siberia until the advent of Altaic speakers from the south. In doing so I shall relate it to both what preceded and what followed it in the region as a whole. To recapitulate, the Bering Strait region (including earlier 'Land Bridge' Beringia, which through much of its existence would have lead to an Alaskan cul-de-sac) constituted a bottleneck into the New World over which successive waves of nomadic hunting people crossed as conditions allowed; here they must - all except the first - have met predecessors, groups held back or left behind, and mingled with them. This can hardly have been without effect on the complexity of linguistic developments.

It is convenient to correlate the picture to the successive archaeological levels revealed at Ushki Lake in central Kamchatka, where unusally favorable conditions have left a clear sequence of cultural layers interspersed with ash deposits from eruptions of the nearby volcanos. Since languages may move slower or faster than archaeological 'horizons' (the same language being spoken by two or more successive cultural phases in a given location or, on the contrary, a single such horizon concealing a language shift by absorption of some incoming group), the seven levels descried at Ushki may or may not match with seven distinct linguistic 'waves'. Major cultural breaks - such as that between levels 7 and 6 - are, however, highly likely also to represent linguistic breaks. Naturally the scenario I am going to sketch, based upon a simplified account of the archaeological evidence, is tentative, but at least it can account for the linguistic situation as we know it today. I shall largely follow the account in Dikov (1979) of the pre-history of the region, but I shall differ from him on one important point of interpretation: the timing of the appearance of the first speakers of an EA language east of Bering Strait[7]. A crucial turning point in the scenario will be the Thermal Maximum following the last Ice Age, from about 5000 to 3000 BC. Major sites and cultures referred to can be seen chronologized on Figure 3. Bear in mind that the delineation of a distinct 'mesolithic' is a matter of definition on the part of archeologists such as Dikov. The Makarovo 4 site near the source of the Lena, has been dated (as mentioned in 1.5) at about 40000 BP.

FIGURE 3



The oldest layer at Ushki, level 7, has been dated to around 14,000 years ago, although new C14 calibrations using paleomagnetic techniques suggest a preliminary revised date of perhaps 2,000 years earlier cf. Dikov 1994, 93). It is archaeologically quite distinct from what follows, with stemmed rather than leaf-shaped projectile points predominating and no wedge-shaped microblade cores such as typify the following level. It is assigned by Dikov to ancestors - or relatives - of at least a portion of the American Indians, probably not those responsible for the first migration to the New World, but a group representing an intermediate wave into the New World during the late Pleistocene Ice Age, when passage to interior Alaska from Asia was free but blocked by ice beyond. One way of looking at this (as hinted at by Dikov himself, 1979, 46) would be to regard this level as reflecting a refugium on the Kamchatkan peninsula of an earlier population whose main body migrated into Alaska and beyond over the Beringian Land Bridge at a time when this was not only physically possible but climatically favourable for non-specialized paleolithic hunters to do so. Whoever the people associated with Ushki level 7 were, they could hardly have been Na-Dene speaking given the archaeological links to sites in Washington State where there is no evidence of Na-Dene penetration until relatively recent times (Dikov op. cit., 48 & 89). Perhaps, given the chronological layering involved, they could be associated with 'Mosan' people of the Northwest coast of

America: post-Clovis sites there date from as early as 10500 BP next to the great salmon rivers traversing the Columbia plateau and are close to the supposed Salishan homeland. It is also possible, however, that Ushki level 7 reflects the rear-guard of a still earlier wave of entry into the New World over Beringia, i.e. those who were forced back by the closing ice, as Dikov supposes[8]. Dikov (1994, 89) specifically relates Ushki level 7 to the Stemmed Point tradition at Columbian sites like Marmes Rockshelter.

The archaeological chronology, together with physical genetic data, suggests at all events that the 'Mosans', speaking languages that display some typological affinity with that of the coast-dwelling Nivkh on the Asian side, represent the last wave of pre-microblade projectile-point manufacturing Paleo-Indians to leave Beringia, having been trapped there by the Wisconsin/Cordilleran ice barrier until the corridor to the south opened once again. See Carlson (1990, 67) for a plausible link - via Kamchatka - between the Mosan people and the Okhotsk coast on the Asian side (once perhaps more widely occupied by 'Amuric' people related to the Nivkh). In connection with the latter he specifically names Ushki level 6. The particular archaeological horizon involved according to Carlson is the coastally orientated Pebble Tool tradition of around 8 to 7 thousand BC, associated with both Salishan and Wakashan people around the Fraser River mouth (and including the Namu site on the British Columbian coast)[9]. In this case they would not have preceded the (pre-)Na-Dene speaking people by very long, and linguistic and genetic mixing between them could have begun already in Beringia. My guess is that they (as opposed to earlier people) would have utilized the coastal refugium route down into British Columbia as it opened, rather than the interior passage used by the more inland-orientated Na-Dene, reaching the Fraser River by 8000 BC. Much of the unglaciated coastal strip here would have been inundated by the rising oceans and obliterated much of the earliest archaeological record. This should not be taken as suggesting that this 'wave' of entry into the New World was made by people already fully adapted to a coastal way of life (such adaptation came relatively late in the Arctic and is unlikely to have occurred already on Beringia). As regards the mtDNA evidence, the Mosan groups that have to date been investigated show a mixture of lineages but with A - which is virtually fixed amongst the Na-Dene - clearly predominating (Lorenz & Smith 1996, Fig.3), and B (typifying populations further south) notably subordinate. A much more fine-grained investigation is called for, however. Comparison with lineages amongst the contemporary Nivkh population are potentially illuminating[10]. This thread will be returned to in 8.2.

Level 6, dated to about 11,000 years ago - or up to 2,000 years earlier according to the recalibrations mentioned above - reflects (along with the following level that represent a further development from it) what Dumond calls the 'Paleo-Arctic' tradition of microblade manufacturers (Dumond 1987, 50). This broad horizon (terminating about 7 or 8,000 years ago) appears to be the result of a spread of big game hunters of the late paleolithic who populated the upper Lena/Aldan region (as at Dyuktai Cave) from about 18,000 to 10,000 years ago; by 9000 BC they had reached both the Okhotsk Sea coast (as at the Kukhtuy site)[11] and the Alaskan side of Beringia (as evidenced in the early Denali complex sites). To reach America they spread all the way across Kamchatka and Chukotka and further over the Beringian Land Bridge. Owing to rising sea levels the Land Bridge would only partially or sporadically have been in place after about 11,000 years ago, when a wetter climate set in that may have led to the demise of the grass-dependent megafauna - mainly mammoth, horse and bison - of the dry, steppe-like Beringian plain (Fiedler 1992, 46). More recent studies suggest that the Land Bridge may

in fact have been in place somewhat longer, i.e. until about 10,000 BP (West 1996, 545f.). It is important to note at all events that the Land Bridge was only in existence during a much shorter window than following the preceding interstadial (in fact according to Hopkins 1967, 468 it was only open during part of the period 13 to 11 (or perhaps 10) thousand BP, a warmer period intervening in the middle so that after about 12000 BP only a segment of it was briefly open again). During this relatively narrow window it is unlikely that more than one or two linguistic stocks could have made it through (even if their speakers had boats), so if the Paleo-Arctic period corresponds to the spread of Indian groups into North America, it is unlikely also to represent the arrival of the Eskimo-Aleut language family.

With the accelerating post-glacial retreat of the ice (if not before), descendants of the people who had preceded them into Alaska would have found their way down either between the glaciers - or, if some of them had boats to cross an already partially open Bering Strait, along the coastal fringe between the ice and the sea (though this seems unlikely) - to more southerly regions of the North American continent. The archaeological traces of the Paleo-Arctic newcomers themselves, however, peter out on the Northwest coast before the Canadian-American border; they are in evidence all the way back along the coast to Alaska in such sites as Ground Hog Bay dated to ca. 9,000 BP in present Tlingit territory (Arutiunov & Fitzhugh 1988, 119). It would thus seem to make sense to associate this wave of people with the present spread of Na-Dene languages (Athabaskan, Eyak, and Tlingit) plus 'pre-Na-Dene' Haida, which may well represent the vanguard of this wave, becoming isolated on the refugium-like Queen Charlotte Islands, away from interaction with mainland neighbours[12].

There is, on the other hand, little to suggest the direct involvement of the ancestors of speakers of EA languages in this movement, although this has often been implied by archaeologists on the basis of such non-linguistic factors as the alleged continuity of the Paleo-Arctic Anangula site on the eastern Aleut archipelago, which dates from this period, with the later sites of modern Aleuts. The presence in Ushki level 6 of labrets - typical for later Eskimo and Aleut cultures - appears to be Dikov's main evidence: he points out that labrets have never been used by Chukotko-Kamchatkan people, for example. However, one should be wary of aligning cultural facts directly with linguistic ones, since one can never exclude the possibility of the rapid diffusion of such traits and there is no evidence that the Arctic Small Tool people - taken widely to represent the ancestors of the Paleo-Eskimos - ever had labrets. In fact labrets were also typical of the pre-Eskimo Kodiak (and eastern Aleut) traditions of southern Alaska. Mason & Gerlach (1995, 2) see a connection - via symbolic mimicry - between the wearing of labrets and sea-mammal hunting. Note that the first Eskimo culture where there is evidence of their use, the Choris phase of the Norton culture at the end of the second millennium BC, was much more coastally-orientated than the preceding AST phase. Perhaps Ushki 6 is after all more directly linked to a coastal 'Mosan' population that affected the Anangula coastal adaptation of the Paleo-Arctic tradition, rather than to an inland 'pre-Na-Dene' speaking presence. In turn this could indirectly have affected Norton and later Eskimo cultures via the Ocean Bay tradition of the Kodiak Island area of central southern Alaska, dated to around 7000 BP.

A linguistically more likely scenario explaining the relationship of the 'Anangulans' to modern Aleuts, then, envisages a Pacific coast areal communality of descendants of Paleo-Arctic people, perhaps already mixed with remnant earlier people in the area and stretching from the Aleutian Peninsula to the British Columbian coast, into which EA

speakers intruded, first the Aleuts (ca. 4,000 years ago) and much later the Yupik speaking Alutiit (about 1,000 years ago). Leer (1991) discusses such an area, but sees the unusual traits shared by Aleut and other languages of the area (such as lack of labial obstruents) as a matter of areal 'influence', whereas it would seem to be just as likely - if not more so - that there was an actual language shift on the part of the original 'Anangulan' population of the Aleutian peninsula to the incoming EA language[13]. More recently, Dikov has suggested a specific link between Anangula (which he still regards as 'Proto-Aleut') and a distinctive new site on the Chukchi Peninsula, at Puturak Pass (Dikov 1994, 93), but the specific affinities of Anangula on either the Asian or the Alaskan side are still the subject of debate. West (1996, 551f.) believes, for instance, that the link is with the Sumnagin (which he sees as the source of a 'late Beringian' tradition extending into Alaska following the earlier - Paleo-Arctic - tradition reflected at the Denali complex sites). It is quite conceivable that labrets reflect a common Beringian substratum trait. The same applies to the Raven creation tales, distributed around the North Pacific Rim in roughly the same area - including the Eskimos and Athabaskans of Alaska (and down the northwest coast of America, but no further east) and the Chukotko-Kamchatkans (but no further west or south). Arutiunov (1988, 40) sees, like myself, the 'Indian-like' cultural traits shared by the Chukotko-Kamchatkan speaking Paleo-Siberians as specifically reflecting an American Indian substratum[14].

In a number of ways the Kamchatkan and Aleutian peninsulas are parallel as isolated residual or 'refugium' zones off the main track of continental developments, regions where traces of earlier populations can be expected. Such earlier populations would (a) have had little reason to want to leave their niches once adapted to them (cf. the rich salmon rivers of Kamchatka, and the abundant marine mammal life of the Aleutians), and (b) have had nowhere to move on to under encroachments from further north. In the case of Kamchatka the Itelmen faced an island chain to the south inhabited in recent times at least by hostile Ainu, remnants of an ancient pre- (if not paleo-) Mongoloid population of far eastern Asia. The only viable possibility - apart from mass extinction - would have been gradual absorption by or of newcomers, hence the impression of broad archaeological continuity in these regions. If the origin of the EA proto-language (as opposed to that of a component of its population of speakers) really dates back to the Beringian Land Bridge, as some archaeologists and linguists have suggested, the linguistic links to Uralic that I have tried to demonstrate would hardly be credible.

As Beringia further dwindled and sank for the last time there were further developments transpiring in the Lena valley - the main 'highway' to the arctic coast (and beyond that, America), which witnessed the most northerly advance of man in Eurasia during paleolithic times (see Okladnikov 1964, 15 and 23). Here, starting as early as 10,000 years ago, the Sumnagin people, fishermen and hunters of wild reindeer, had begun replacing - or developing from - the Dyuktai big game hunters, most of the descendants of whom were by now pushing across and down into the New World following the remaining herds of Ice Age megafauna (mammoth, wooly rhinoceros, etc.). Map 3 reflects the middle of the Sumnagin period. Contemporaneous people of a similar way of life further west between Baykal and the Yenisei are represented at such late Paleolithic sites as Ust'-Belaya in the Angara valley (not to be confused with the much later site of the same name on Chukotka; cf. Mochanov 1978, 63). There is a terminological problem here which complicates the direct comparison of these geographically separated regions, namely the word 'mesolithic' - Okladnikov, the pioneer

in studying the Angaran sites, does not use this word for Siberia at all, referring to the sites transitional to the Neolithic as 'late Paleolithic' rather. It should be stressed that, in the light of Dikov's belief in the local development of this culture (as mentioned in 1.5), the actual term 'Sumnagin' may be misplaced in referring also to these more westerly Siberians, from whom Mochanov (1978) derives them; an alternative possibility is that the Sumnagin culture as such preceded the expansion of mesolithic Uralo-Siberians into the Lena/Aldan region. At about the same time, at all events, the Paleo-Arctic people of Kamchatka adjusted their technology somewhat to the changing conditions of the early Holocene, but level 5 at Ushki essentially reflects local continuity from the preceding level (this does not of course exclude the possibility of the arrrival of newcomers bearing a new language, say pre-Na-Dene as opposed to Mosan).

By 4000 BC people related to the Sumnagins may have reached Kamchatka, as evidenced at sites like Amguema and possibly Ushki level 4 (where the predominance of microblades yeilds to larger knife-like blades). The exact relationship between these new people in the upper and middle Lena/Aldan regions and the later burgeoning of the Siberian Neolithic as represented both at the Bel'kachi site on the Aldan river and at level 3 of the Ushki site is not entirely clear[15]. A further confusing factor is the presence of a different mesolithic culture (producing bifacially worked blades, unlike the Sumnagins) in the upper Kolyma region just before the time of Ushki level 4 - Dikov (1979, 100ff) links this Maltan complex both to the modern Itelmen and to the Okhotsk sea coast further to the southwest. Perhaps it reflects the substratum behind Itelmen.

At all events, it is no coincidence that the culmination of this period, corresponding to the end of the post-glacial thermal maximum around 3000 BC, was just before the time when the first Paleo-Eskimos were to appear on the shores of Bering Strait, the Arctic Small Tool people of Cape Denbeigh on the Alaskan side (about 2500 BC - compare Maps 4 and 5). The way of life of these people was still essentially mesolithic, combining the hunting of wild reindeer with fishing, though their culture contained some elements typical of the Siberian Neolithic (Dumond 1987, 51). They must surely represent the starting point of a specialized adaptation by hunting people from the interior of Siberia to the onset of a major cooling trend - the ability to exploit both land and coastal subsistence resources to the full would have been crucial to survival. Though probably not identical with the Sumnagin people of the Aldan valley, it is reasonable to see the people of Ushki level 4 as a vanguard of related mesolithic people from the interior that included not only the Sumnagins but also the ancestral speakers of Proto-Eskimo-Aleut. The following level 3 at Ushki appears to be more directly relatable to the Ymyjakhtakh phase, to which I shall return below.

Even if the AST people do not represent the immediate linguistic ancestors of the modern Eskimos (the Kahruak site near Barrow, slightly earlier than the Cape Denbeigh finds, may reflect the common source of both the AST people of Cape Denbeigh and the pre-Dorset people of the Arctic coast according to Fiedler 1992, 151), the language they spoke would in all likelihood have been an offshoot of the same US complex. This date can also be compared to the approximately 4000 years that have gone since Aleut and Eskimo began to go their own ways according to recent estimates (cf. Fortescue 1985, 207) - and note the similar time depth archaeologists speak of for the movement of 'Neo-Aleuts' out onto the Aleutian islands[16]. One can imagine expanding groups of advanced mesolithic/incipient neolithic hunters, who, following the movement northward of the tree line, had already reached the interior of Chukotka, being attracted gradually out to the rich maritime hunting regions of the arctic coast and - especially - Bering Strait, as the

climate began to cool.

The Arctic Small Tool people were equiped with finely crafted side- and end-notched blades (amongst other technological innovations), and must have had boats of some kind to cross to the American side of the strait. Once there they tended to stay near the coasts only in summer, retiring inland in the winter, where they lived in semi-subterranean houses, subsisting mainly on caribou and salmon. Ultimately they (or closely related people) were to reach Greenland as the 'Independence One' and other groups deriving from the pre-Dorset of central Canada. These earliest people on Greenland, hunters of the muskox of some 4,500 years ago, had typical AST tools, Aleutian type barbed harpoons, dogs, and kayaks as well as - for the first time in the New World - bows with bone-tipped arrows (elsewhere one of the hallmarks of the neolithic, with or without ceramics); there is even evidence that they had Mongoloid features and practiced Eskimo type facial tattooing (as evinced by at least one sculpted figure from the early Saqqaq phase of the first inhabitation of Greenland). By the time of the Dorset in the central Canadian Arctic they had acquired seal-oil lamps made of soapstone, toggling harpoons and snow knives of the type used for building igloos, all of which they may have passed on to the Thule Inuit.

The Aleuts themselves (whether representing the same or a roughly contemporaneous wave of AST-related people southwards from Bering Strait) could have moved out along the north coast of the Alaskan Peninsula, mixing with peripheral Ocean Bay groups, although the south side of the mountains would have been already relatively densely inhabited by descendants of those no doubt powerful, sea-mammal hunting people. With the advent of a new slate polishing industry amongst the people of Kodiak island after 3000 BC the area inhabited by the Aleuts became increasingly peripheral and isolated from the bearers of this new tradition: the cultural area once extending all along the Northwest Pacific coast of America had now been broken by intruders speaking no doubt a quite unrelated, Eskimo-Aleut language. Indeed the neo-Eskimos of Bering Strait were to adopt polished slate technology (and no doubt other elements) from the south before it reached the Aleuts. Interestingly, the population of the westernmost 'Near Islands' appears to have preserved a closer affinity to the Ocean Bay tradition as regards tool inventory than the more easterly Aleuts (Dumond 1977, 76).

There would appear to be no reason, then, not to see people related to the Sumnagins in the interior of Siberia in the eighth to fourth millenia BC (the transitional Mesolithic period of the early Holocene) as representing the principal source of the ensuing neolithic cultures of Bel'kachi and Ushki level 3, as well as of the Arctic Small Tool people (thus Ackerman 1984, 116f.)[17]. As we have seen in 7.1.2, to this same source - or one akin to it - may be ascribed the origins of the Uralic languages. In fact, Dikov descries what may be a direct 'missing link' between the Sumnagin Mesolithic and the Paleo-Eskimos of Alaska in the pre-ceramic people of Lake Tytyl and adjacent sites of interior Chukotka of the fourth or fifth millennium BC, in whose tool inventory both Sumnagin and Paleo-Arctic (microblade) traits are found (Dikov op. cit., 133). Note that at this time the arctic coast still lay farther north than in recent times, the nearest arctic islands still being attainable by land from the shore, so much of the archaeological record could have been lost.

On the opposite continent, there had also been a movement of people north from the interior - perhaps constituted by returning groups of Paleo-Arctic people who long before had moved south between or around the retreating glaciers and mixed with an earlier Indian population, although it is also possible that it was more a matter of Indians

from the south moving up to the vicinity of the Paleo-Alaskan people of Alaska, the influence from the south at this stage being largely cultural, borne by few actual people. Some of the representatives of this 'Northern Archaic' tradition were at all events probably among the immediate ancestors of the Athabaskans[18]. This intrusion as far as the western coast of Alaska from the interior of North America in the period between 4 and 6 thousand years ago (following an archaeological gap of two millenia in Alaska) is a problem for those who would directly derive the Eskimo-Aleuts from the earlier Paleo-Arctic peoples of Alaska and Beringia. The Northern Archaic people were to retreat southwards as the climate cooled again, ceding most of Alaska to the Arctic Small Tool newcomers, whose predecessors had meanwhile arrived from Chukotka.

The broad similarities between the stone tool inventory of the peoples of the middle Lena and Aldan Neolithic and of the Arctic Small Tool people is acknowledged by Dikov, but as mentioned above, he sees all of them as springing from the same Paleo-Arctic 'cradle' from which also the Athabaskans must have arisen - a notion very difficult to square with the linguistic facts. These point rather to the west within Asia as the direction to search for the genetic affinities of Eskimo-Aleut. In all respects the Athabaskans would seem to represent - especially by language, but also by culture - a quite different people than those who spoke EA (and CK) languages. There could nevertheless have been contact and indeed mingling with the newcomers to Alaska at this time, although there would appear to be no ancient Eskimo-Aleut loanwords in Athabaskan languages and no ancient Athabaskan ones in Eskimo-Aleut, which is difficult fact to account for if the two families had existed shoulder to shoulder as distinct populations ever since Beringian times.

With level 2 at Ushki, around 2000 BC (see Map 5), we pass to the full-blown ceramic neolithic/bronze age in Siberia and the first clear signs of the Chukotko-Kamchatkans in the region. This was the period of the Tarya culture of southern Kamchatka, where newcomers from further east (who probably started to arrive on Kamchatka at the somewhat earlier stage reflected in level 3 at Ushki) mixed, as I have suggested, with people left behind from a much earlier wave of people heading for the New World but trapped in the Kamchatkan 'appendix' of the Old. They lived in semi-subterranean dwellings of an Eskimo-Aleut type (entered through the roof by ladder, like the traditional Aleut house - also associated with the Old Koryak and Old Kerek cultures) rather than in the skin tents of their mesolithic ancestors; they probably represent the ancestors of the more recent salmon-fishing Itelmen. The relationship between the pre-Tarya Kamchatkans and the modern Itelmen could well be analogous to that between the (non-Eskimo-Aleut-speaking) Paleo-Aleuts and modern Aleuts. Despite the relative economic backwardness of the Itelmen in more recent times, their ancestors created an influencial culture, which may have mediated between people as far apart as Eskimos and Chinese: they appear, specifically, to have had some commerce with the Norton Eskimo people on the other side of the strait.

These were probably the direct descendants of the Arctic Small Tool people who, following a brief retreat northwards, were now returning south (during the continuing cooling trend); they brought with them a more decidely coast-orientated way of life (including the hunting of seal on the sea ice) - and also ceramics of an Asian type. The Kamchatkan newcomers - who are even more clearly represented in the most recent level 1 at Ushki of about 1000 AD - may have represented an early splitting off from the same people who developed the neolithic Ymyjakhtakh culture of the middle Lena of the second millennium BC, which had by now in turn replaced the Sumnagins. They were the

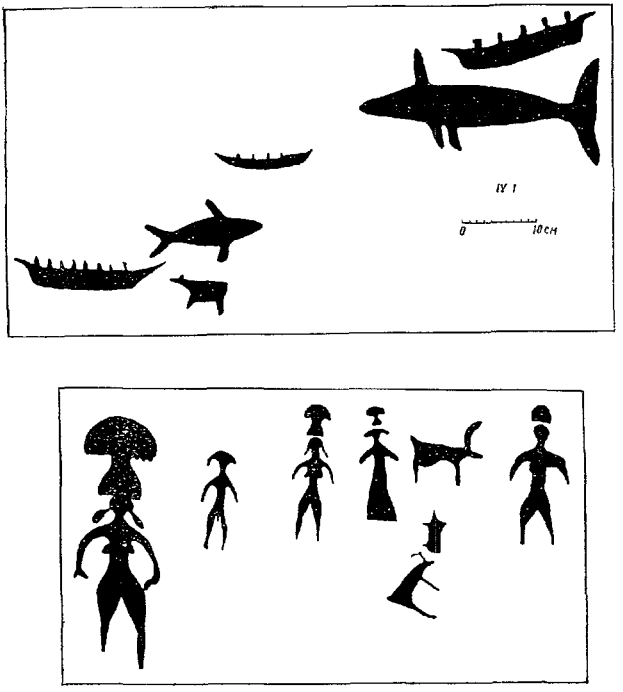
ancestors of the modern Chukotkans according to Dikov and other Russian archaeologists. Essentially wild reindeer-hunters by economy they nevertheless had some knowledge of bronze; they appear in Chukotka as the Ust'-Belayans[19]. These and perhaps other related neolithic groups of Chukotka were to meet the Eskimos and at least to some degree adapt to coastal hunting themselves.

Where exactly the Ymyjakhtakh people came from before that is no clearer than in the case of the preceding Sumnagin and Dyuktai peoples, but everything points in the same direction, back down the Lena valley to the Baykal area or - as Dikov suggests - via a more westerly route following the Yenisei valley down to the Sayan area, i.e. following similar routes of dispersal as those taken by earlier waves of hunting people before them. The linguistic facts on which the present work is based indicate a distant affinity of CK with the Uralic languages, parallel to that of EA before it. Note also the widespread river names ending in **-wa** on both sides of the Urals according to Schostakowitsch (1927, 89), relatable to Permic ***vija-** 'flow, current' (Yukagir **waj-**) and Chukotkan **wæjæm** 'river'. The period at which the presumably Chukotkan-speaking Ust'-Belayans made contact with already coastally-orientated Paleo-Eskimos may well have coincided with the Old Whaling phase in evidence on Wrangel Island off the arctic coast of Chukotka, the first sign of adaptation of the Paleo-Eskimo people to large sea mammal hunting[20]. Again, climatic factors may have been important, the arrival of the Ust'-Belayans on the coast coinciding with a warmer phase. This meeting may in fact be reflected in the famous Pegtymel petroglyphs of the region (see Figure 4), although they are tentatively assigned to the somewhat later Old Bering Sea (Neo-Eskimo) phase. These scenes combine coastal and inland traits in a most graphic way: besides the realistic whaling scenes, caribou hunting from kayaks on the rivers of Chukotka is also portrayed. The anthropomorphic figures with the mushroom-like shapes above them represent the 'spirits' of the fly agaric, a hallucinogen used until recently by Chukotkan shamans (the mushroom itself does not grow much further north than the Anadyr river mouth). Intriguingly, similar petroglyph figures have been found in the Sayan canyon along the uppermost reaches of the Yenisei - the same region from which, according to my hypothesis, the original Sumnagin-type speakers of Uralo-Siberian spread (Dikov 1979, 159).

Then, at the beginning of our era (starting a couple of centuries prior to it), we witness the burgeoning of the Neo-Eskimo cultures around Bering Strait, with continuing cultural influence from further south within Asia, as far at least as the Amur and Iron Age China beyond (Map 6). The split between Yupik and Inuit Eskimo probably has its roots in these events. Dikov makes the interesting proposal that part of the diversity of the cultural scene at this time was due to the involvement of not only the Eskimos but also the Paleo-Siberian Ust'-Belayans in these cultures: he specifically sees the latter as representing an important ethnic component of the Old Bering Sea Culture, more or less contemporaneous with the purely Eskimo (labret-wearing) Okvik culture (Dikov 1979, 211). There are cultural links that point back to the lower Amur and Japan and Korea beyond (e.g. in ornamental styles, slat armour, and the limited use of metal tools for carving); these are particularly strongly in evidence in the Old Bering Sea variety of 'Neo-Eskimo' culture. American archaeologists tend to emphasize rather a reflux of Eskimos back to the Chukotkan coasts from Alaska at this time. In fact the Sirenikski Eskimos of the south coast of the Chukotkan peninsula, speaking a very aberrant, peripheral form of Eskimo much influenced by Chukchi, may represent a remnant Eskimo population that never moved to America. Certainly the later Siberian Eskimos do seem to represent a

reflux back from Alaska, however. Either way, by now all the essential elements of traditional Neo-Eskimo culture were in place (skin boats, toggling harpoons, polished slate blades, semi-subterranean houses, etc.), but this was not the route followed by the majority of Paleo-Siberian Chukotkans: they were to develop instead their own inland reindeer-herding culture. If some of them had, as Dikov suggests, been involved in the early phase of adaptation to sea-mammal hunting on the Asian side of Bering Strait - and certainly the Old Koryak culture of the Okhotsk coast represents an extension of this to the south - the majority of them may have fallen back on an earlier way of continental life as climatic conditions began to deteriorate into the so-called Little Ice Age (the 13th to 16th centuries AD). It was only then that they adopted reindeer herding, which they learnt - like the Yukagir - from their Tungusic neighbours to the west (who may in turn have learned the techniques of domestication from horse herders further south). Unlike the Evens, they never took to riding their reindeer for transport however.

FIGURE 4



Pegtymel petroglyphs (Dikov 1979)

This development may represent simply the latest episode in a reoccurring fluctuation back and forth between maritime and inland adaptation that Krupnik (1993, 210ff) discerns in his 'dual subsistance model', occurring again and again amongst the peoples of arctic Eurasia as the climate swung between warmer periods (favouring marine orientation) and colder ones (favouring inland orientation). He observes that all the major cultural burgeonings on the arctic coasts (including the Old Whaling, the Old Bering Sea and the later Thule Eskimo cultures) occurred during warmer periods[21]. It

should be borne in mind that the development of large scale reindeer-herding and the fully-fledged hunting of large sea mammals both were lengthy processes involving various stages and degrees and even temporary reversals.

By then new people had turned up in the interior valleys of Chukotka, representatives of - or at least related to - yet another culture of the Lena valley, this time the Buolkalaakh culture of the 2nd to 1st millennium BC, with sites near the mouth of the Lena. These people maintained a virtually mesolithic type of technological profile longer than the other peoples we have been discussing[22]. They were hunters/ fishermen of the forest tundra who until recent times apparently maintained a matrilineal social organization (like the Itelmen). They probably spoke something akin to Proto-Yukagir. It is somewhat easier to relate their language to Uralic than is the case with Proto-EA and Proto-CK, which, as we have seen, probably split off from the common proto-language (or mesh) at an earlier date. These 'new' people, who spread over vast tracts of northern Siberia, moved also eastward in the wake of the Chukotkans in the established direction of migration from interior Eurasia towards Bering Strait. They represent the last wave of people speaking a Uralo-Siberian language to move out from the homeland region (compare Okladnikov 1964, 57, who sees the origin of the Yukagir in the Lake Baykal region). They may have displaced or absorbed rear-guard Chukotko-Kamchatkan groups ahead of them until the majority of the latter veered right on the Aldan-Okhotsk Sea route to Chukotka[23]. This would have allowed free access once more to the arctic coast at the mouth of the Lena, whence the Yukagirs spread out, some of them reaching as far as the Bering Sea coast via the Anadyr river. These eastern groups - the 'Chuvans' - were gradually assimilated, however, by the Koryaks (and later Evens and Russians) expanding through the interior of Chukotka at the dawn of written history (the beginning of the 18th century for this region). Despite their simple economy, the Yukagir were the only people of the region to develop a kind of pictographic writing system (the so-called birch bark 'tos' - cf. Levin & Potapov 1964, 797).

More recent developments (occurring either just before or just after the approximate 'contact' situation shown on Map 7) include the expansion (during another warming phase) of the Thule Eskimos, who represented maximal adaptation to ice hunting and - like their Punuk relatives on St. Lawrence Island - pursued whales in organized crews at sea[24]. They developed out of the Birnirk phase of Neo-Eskimo northern Alaska, which started in the 6th century AD and was the first Eskimo culture to cover most of the arctic coasts of both Alaska and Chukotka (the Okvik people and their Punuk followers were concentrated on St. Lawrence Island, with little more than a toe-hold on the Asian mainland, and the Old Bering Sea people - whoever they were ethnically - never maintained their position on the American side). The Thule whale hunters spread rapidly from Alaska across the Canadian Arctic, finally reaching as far as East Greenland. Amongst the immediate causes of their expansion eastwards Fiedler (1992, 157) mentions the deteriation of conditions for seal-hunting on the ice and the displacement of whale migration routes (linked to the warming climate), and the build-up of the Alaskan population (including immigrants from Asia), accompanied by increasing signs of warfare. McGhee (1988, 376) also stresses the important trade links between northern Alaska and Siberia, including trade in iron. Within Alaska they spread down to the Pacific coast, bringing Thule style pottery to Kodiak island by 1100 AD. Thule influence at least returned to the Asian side too, where at the same time there are clear traces of the Punuk culture along the south coast of Chukotka as far as the Kamchatkan isthmus and beyond to the Okhotsk Sea. The language of the Thule people of northern Alaska would

have been Inupiaq by then, whereas the contemporary Eskimo presence on the Asian side would have been borne primarily by Yupik or perhaps specifically Sirenikski speakers (it may be to this period that we can assign the arrival from Alaska of Naukanski Yupik people from Seward Peninsula under pressure from the Inuit expansion behind them).

In the east they at first followed the northerly passage of the bowhead whales, and only began moving south within Canada (and Greenland) as the climate again cooled, reaching Labrador as late as 1300 AD and absorbing or displacing residual Dorset people still there. In (or on the way to) Greenland the Thule Eskimos met not only remnnant Dorset but - some time after 1200 - also Norsemen who had arrived in the south of Greenland by 1000 AD; in fact all three groups may have been in trading contact in northern Greenland at that time (H.-C. Gulløv, pers. comm.). Following this last period of wide-scale migration the Thule Eskimos settled in more clearly delineated, though still very isolated territories. Back in the west, no later than 500 BC (and probably earlier - see Krauss and Golla 1984, 68) movements southwards by Athabaskans resulted in the presence of Athabaskan languages on the Pacific coast of Oregon and California - this occurred at all events much earlier than the movement towards the south-east of the Apachean Athabaskans, who reached their present position not long before contact with the Spanish. The Tlingits, on the other hand, must have expanded northwards at some stage from the southern end of their present territory (where dialect differences are greatest).

Meanwhile in Chukotka, the Chukchis (those, that is, who had not remained on the coasts to be absorbed by the Eskimo population) appeared - or rather reappeared - in the far north in their final thrust up to the vicinity of the arctic coast with their expanding reindeer herds. Some of these inland 'reindeer' Chukotkans also intermarried with Eskimos now sedentarized in villages along the coasts, bringing a more patrilineal and agressive form of clan-based social organization (which spread to their Siberian Eskimo neighbours - there was warring between them and the Eskimos as well as among themselves). The coastal Chukchi and Koryak (including the Alutors and Kereks) are probably to a considerable extent Eskimos who have shifted language. Contact in recent centuries has been intense, as can be seen in the loan words both ways between Chukchi and Siberian Eskimo as well as in the exchange of cultural and technological artifacts. Trade between coast and interior welded an almost symbiotic relationship between the coastal people (whether Chukchi or Eskimo speaking), who provided the seal blubber to fuel the lamps essential as an efficient source of heat and light during the winter, and the inland Chukchi herders, who provided the reindeer skins essential for tent skins and warm clothing. As Bogoras noted, coastal women tended to marry inland men more often than the other way round[25] - perhaps it was through women moving inland that the sibilant pronunciation of original /c/ (a Bering Strait development shared by all Inuit and Siberian Yupik Eskimos) spread to all except the westernmost Chukchi (sub-)dialect. In general, there is little dialect differentiation within Chukchi, which Bogoras sees as due to mobility and frequent exchanges between the inland and coastal Chukchi (more pronounced than among the inland and coastal Koryak, where dialect differences are much greater).

The final chapter is the infiltration of the nomadic reindeer-herding Tungusic Evens as far as Kamchatka itself[26]. But this - roughly contemporaneous with the expansion of Turkic speaking Yakut pastoralists up the Lena valley to the Arctic as late as the 13th century AD under Mongol 'pressure' from further south (Okladnikov 1964, 89) - takes us beyond the confines of the world of the descendants of speakers of early Uralo-

Siberian and up to the arrival of the first Russians in the region. These later developments should not be seen as rapid intrusions of new people, ousting those already there, but rather as the gradual impingement of languages and ways of life from further south on the (Paleo-)Siberian population already largely in place. Thus the modern Tungus and Yakut peoples consist in large part of original Siberians who have shifted both language and culture (Levin 1963, 280f. and Levin and Potapov 1964, 244f. respectively). Dolgan in turn may represent a Tungusic group that shifted to Yakut fairly recently (Comrie 1981, 53). The Yakut language itself displays evidence in the form of loan words of prolonged contact with Mongolian rather, probably around Lake Baykal (Janhunen 1996, 162). The Yukagir were profoundly affected by these newcomers - even their clothing style is essentially Even. In fact, the relationship between the Tungus and the Yukagir who proceded them northward is particularly complex and telling: the former may represent 'tungusized' Yukagirs, while the latter have in turn in more recent times beeen largely absorbed and 'retungusized' by the former!

A number of references to arguments based on physical 'types' have been adduced in the preceding, but a general caveat should be made here: given the variability within 'types' and their general irrelevance when whole populations shift language, one should be wary of using them in a linguistic context. Such considerations are nevertheless part of the wider picture. As Debets (1962, 127) put it: 'language and culture may spread regardless of physical type but physical type does not spread without language and culture'. Recent mitochondrial DNA studies such as that by Shields et al. (1993) that indicate specific genetic traits - or their absence - shared by most circumarctic populations can not be ignored. In this study, already mentioned in Chapter 1, the authors show that one genetic trait common among peoples further south within both America and Asia ('9-bp deletion') is lacking among all the Siberian and American peoples I have related via the hypothetical Proto-Uralo-Siberian language (including Eskimos, Aleuts, Chukchis and Yukagirs). But this lack also embraces the Na-Dene (including Haida) peoples of North America, representing the Paleo-Arctic population of Beringia, and the Tungusic and Yakut peoples of Siberia, who are seen by Russian investigators as representing Paleo-Siberian groups who have shifted language under encroachments from the south. The authors suggest two alternative interpretations as regards the physical spread of this trait: either incoming Eskimo-Aleuts from Asia mingled with a population already in place from a previous wave of migration into the New World (the Paleo-Arctic substratum theory also now preferred by Dumond) or both Athabaskans and Eskimo-Aleuts sprang directly from the same genetic stock in situ in Beringia (Dumond's earlier 1977 position). In section 8.2 I shall return to my own linguistically based interpretation, closer to the former than to the latter.

Notes to Chapter 7

1. There is in fact one term for 'reindeer' that may be common to several Siberian US languages, although it could be a late loan from Even, as discussed in 6.3. It is not present in EA, which is not unexpected, since the name for such an economically important animal as the wild reindeer/caribou for all these people might well be subject to periodical renewal (e.g. for taboo reasons). The PE word for 'caribou' appears, for example, to be literally 'thing with much back fat' (with additional suffix 'big' this refers to a moose in Alaska). As regards flora, the PE

word for tree is literally 'thing that stands upright'.

2. As mentioned in 2.4, Rasmus Rask had already hinted at this on purely linguistic grounds in the early nineteenth century.

3. Dolgikh (1962:242) mentions a candidate pre-Uralic Saami culture in Karelia from the 3rd millennium BC. Xelimskij (1982:50f.) mentions a still earlier horizon, well before the conjectured break-up of Proto-Uralic (for him, the fourth millennium BC, somewhere in western Siberia). He sees this as evidence of an ancient 'paleo-arctic' substratum population behind not only the primarily 'Europoid' Saami but also the primarily 'Mongoloid' northern Samoyeds to the east. How long the Saami have spoken a Finno-Ugric language is the subject of ongoing debate.

4. Note the mixing of western Siberian Mongoloids (Yenisei/ Samoyed people of the Katangan sub-type - including the reindeer-herders of the Sayan uplands) with Europoid groups from the west to produce the modern western Uralic type as described by Levin (1963:161). Compare also the admixture of the 'Middle Asian' type with respectively the 'Uralic' and 'Baykal' types in the make up of many of the northern Turkic and Tungusic peoples of Siberia (see Levin & Potapov 1964:101f, who specifically relate this to the linguistic communality of the Altaic languages).

5. It was the Afanasievans, probably IE-speaking eneolithic pastoralists who assimilated neighbouring sub-neolithic (Uralic) people of the Altai/Upper Yenisei region (see Mallory 1989:223), that introduced stock-breeding techniques into the Sayan. In doing so they may have caused disruptions that resulted in the splitting off of the Yukagir from their Uralic fellows. These could have been pushed further up the Lena valley while the Samoyeds - and other people of the Sayan - began to develop already at this early stage their own new kind of reindeer breeding economy (although the earliest traces of reindeer breeding in the region so far is from about 2,000 years ago acc. Okladnikov 1964:68).

   It may be that it is back to this level (before 3000 BC) that one should trace the linguistic reflexes of contact - or even blending - between Indo-European and 'Ural-Altaic' languages, rather than to a more remote 'Nostratic' past. The Afanasievan culture is a good candidate for reflecting such contact, carried as it was from the Pontic steppes westward by people who straddled the edge of the steppe and forest zones between about 3000 and 2000 BC. Later displaced southwards in turn by probably Turkic-speaking hunters from the east, they seem to have turned up later in history as the Tocharians. Common typological traits specifically between Uralic and Tocharian might be significant here - one thinks of the AN/GN and SOV ordering and postpositioning nature of Proto-Uralic, Altaic languages and Tocharian (also of Hittite and Sanskrit and therefore probably also Proto-IE, but unlike these with a much simplified inventory of consonants, more similar to that of UA than to other IE languages). Probably more significant - both ethnically and linguistically - is the mixture between Uralic and Turkic speakers at this early stage (note that Turkic shares with Uralic the highest number of old case markers of any Altaic group - Sinor 1988:725).

6. US speakers, scattered over vast tracts of Siberia, may have linked up again in the far North one more time during the first millennium AD, since according to Dolgikh (1962:281) there is a Yukagir element discernible beneath the easternmost Samoyeds, the Nganasan. Such Yukagir groups, having swung left at the headwaters of the Lena rather than east, where otherwise to become completely tungusicized. Slightly later a similar kind of meeting (across a time depth of around 3,000 years) must have occurred when Thule Eskimos moving east across Canada encountered the Dorset people who had preceded them. It is unlikely that communication over such time depths would have been possible in either case.

7. As an archaeologist he does not directly talk of languages, of course, only of ethnic groups and their possible identification with prehistoric cultures.

8. There are very few undisputed pre-microblade sites in Alaska, but one group in particular, the Nenana complex, dated to the centuries after 12000 BP, as discussed by Fiedler (1992:59 & 148), could represent a population exploiting a late macrofaunal refugium in central Alaska and even be ancestral to Clovis, the earliest native American projectile point tradition. It displays certain links to Ushki level 7.

9. This was distinct from the inland-orientated Stemmed Point tradition, probably associated with Sahaptin (Penutian) people who reached the area before them from inland, with links back to the early Fluted Point tradition of continental America. It is interesting to note that Arutiunov & Fitzhugh (1988:118f.) see early sites on Sakhalin like Takoie 2, dating to the 16th millennium BC and containing unifacial microblades, as a possible source for the American Fluted (Clovis) Point (earliest appearance about 9500 BC); they may in turn be related to the interior Alaskan Nenana site mentioned above. The Pebble Tool people preceded the Northwest Microblade tradition (associated with Na-Dene and Haida) in the Northwest coast region. Presumably Carlson links them to Ushki 6 because of the presence there of leaf-shaped projectile points similar to those of Pebble Tool sites (they are of the Dyuktai type, so the path may ultimately lead back to at least contact with the Aldan River Paleo-Arctic people). However, at least one of these has been found in older level 7 at Ushki, along with stemmed points (cf. Fiedler 1992:37f.); the latter were only acquired later by Pebble Tool people, both types being present at Marmes Rockshelter and the related Milliken site on the Fraser. These sites attest at all events to the close contact between the two adjacent cultures on the Washington State Plateau. So the Mosan link could still be with pre-microblade level 7. Particularly interesting in this connection is the relic paleolithic Siberdikov culture on the upper Kolyma river described by Dikov (1979:90ff): this culture is dated to between about 10000 and 8000 BP and displays in its primitive pebble 'chopper' type tools links both to the British Columbian coast and to the earliest sites in the vicinity of the Amur, such as Kumarakh 3, 25,000 to 30,000 years ago (there are also leaf-shaped points present, as at Ushki). Note that Swadesh (1953:26) calculated by glottochronological methods a time depth of 9,000 years for the purported 'Mosan' (Wakashan plus Salishan) stock.

10. The one mtDNA study that includes Nivkh that I am aware of is Merriwether et al. (1996:208), where Lineage A is lacking in their subjects (as in neighbouring Tungusic, Samoyedic and Yukagir populations), but where D is prominent, as amongst Mosans (and also to some degree among Alaskan Eskimos, Chukchi and - especially - Aleuts). Nivkh - as part of a broader 'Amuric' family (Janhunen's term) - could represent the result of contact with some unknown coastal language on the part of a language moving eastward from inland (Manchuria?) in Paleo-Arctic or later times. Note that Nivkh seem to share some lexical links with Tungusic and Mongolian (cf. Panfilov 1968:430), besides such common typological traits as inclusive/exclusive 1st person, numeral classifiers and negative verbs (also found in Mosan), and specific personal and clan-name formants (Panfilov 1962:58). These could have spread from Nivkh to Ainu, which also shares some of them, although Ainu itself could have deep links with America (cf. its 'Americoid' incorporation and applicative constructions). An intriguing possibility here concerns the recent - and highly controversial - find of the 'Kennewick man' in Washington State, apparently some 9,300 years old but displaying 'Caucasoid' features (as reported in Time, Oct. 14th 1996:43). This could conceivably reflect this same layer of relationship between the Old and the New Worlds, i.e. represent one of the strands underlying the 'Mosan' linguistic wave of entry, but borne by a physical type rather closer to the modern Ainu (who have also become mixed with more recent Mongoloids from inland Asia).

11. Although according to Dikov (1979:69f.) there were analogous developments on Hokkaido already before 15000 BC. As regards the Dyuktai tradition, note that Mochanov (1978:62ff) traces this back to much earlier roots on the Aldan river (35000 BP), but the dating of these sites is not accepted by Dikov (they are by West 1996, however).

12. They were not the first inhabitants of these islands: there are sparse archaeological traces of earlier, probably Mosan-speaking Pebble Tool people there (see note 8) - the presence of microblade-using Paleo-Arctic people on the Queen Charlotte Islands dates from around 5000 BC). However, contact with the neighbouring Tsimshian is recent and superficial (Enrico 1984:226). The movement back onto the (Alaskan) mainland by some northern Haida was very recent (since the 18th century).

13. Dumond (1987) cites physical anthropological evidence (cranial measurements, blood type, dental peculiarities) which suggests a particularly strong link between the Aleuts (especially the earlier stratum of their make-up as descried in the remains of the pre-Aleut population) and Athabaskan and other Northwest Coast Indians within the wider web of connections embracing also the Eskimos and Paleo-Siberians. Dumond's own conclusions in relating such facts to the most recent archaeological evidence on the Alaskan Peninsula and Eastern Aleuts is that there was an ancient continuity between the Aleutian chain and the Northwest coast of America, albeit with the Aleutians as peripheral, since the making of polished slate tools which flourished in the more easterly part of the area after about 2500 BC reached the Aleutians only at a much later time, when Neo-Eskimo peoples were adopting this technique further north. The whole area,

from the Tsimshian of British Columbia to the Alaskan Peninsula, is characterized by the wearing of labrets (especially by women), and there is archaeological evidence of their use by early Mosan people of the Fraser River mouth by 1500 BC (Carlson 1992:65), i.e. before the Eskimo Choris phase. This early cultural - and perhaps linguistic - continuum was broken by the intrusion of Aleuts some four thousand years ago, preceding the Eskimos. Dumond sees the latter as arriving separately from Asia, Arctic Small Tool people who spoke some language unrelated to Eskimo but who through contact with Aleuts on the Alaska Peninsula around 1000 BC switched to a form of Eskimo-Aleut. Note that this last part of his hypothesis is linguistically unlikely, since Aleut with all its typological 'skewedness' looks much more like Eskimo-Aleut with a foreign substratum than Eskimo does (the speakers of ancestral Eskimo could hardly have learnt their language from speakers of Proto-Aleut).

14. Mostly a matter of shared myths (especially the Raven cycle). But note also that like all northwest Pacific coast people the Itelmen of Kamchatka (differing from the modern Chukchi and Siberian Eskimos, for example) apparently displayed a matrilineal social organization. This was also so among the Aleut (cf. Lantis 1984:176), who were more hierarchically stratified than among the northern Eskimo (the Koniag Eskimos were more like neighbouring northwest coast people in this respect). Among the Eskmimos duo- or 'merging' linearity (and endogamy by default, as it were) was the norm, while among the Chukchi and Koryak and (presumably via them) the Siberian Yuit patrilineal clans had developed by contact times (or, according to Bogoras, were just in the process of forming); these divisions were largely lost again among the Chukchis and Koryaks however. Note that the exogamic clans of the Alaskan Athabaskans and Tlingit were, unlike their Asian counterparts, matrilineal.

15. Ushki level 4 (which he sees as probably representing the 'same people' as those of following level 3) Dikov calls mesolithic, like Sumnagin proper on the upper Aldan; unlike the latter, however, Ushki level 4 also contains bifacial arrow points. Note that he brackets all the post-Sumnagin cultures I mention - namely Ymyjakhtakh, Buolkalaakh, Ushki 3 and the Denbeigh (Arctic Small Tool) complex - as 'late mesolithic/neolithic'. Ushki level 3 is characterized (among other traits) by arrowheads triangular in cross-section and by small side blades (Dikov 1979:113ff).

16. There is still no convincing archaeological evidence to date for the movement of people directly from Kamchatka onto the Aleutian islands in the other direction. The distances between the mainland and the Commander Islands - and beyond them to the Near Island (Attuan) group - are much greater than between the islands further east.

17. Recall from 1.5 Mochanov's linking of the Eskimo-Aleuts to the Sumnagin culture. Ceramics were present at the end of the Sumnagin period, suggesting contact with the Baykal Neolithic already underway further south. Their use was passed on to the neolithic cultures in the middle Lena region, while the Arctic Small Tool people remained without ceramics until the ensuing stage. This is no

reason to reject the possibility of linguistic affinity, any more than the presence of Dyuktai-like microblades amongst the Arctic Small Tool inventory constitutes proof of linguistic continuity. Contact between newcomers and remnant Paleo-Arctic people on or near Chukotka is surely enough to explain such phenomena (note that the following Paleo-Eskimo Norton people had both acquired ceramics and lost the use of microblades!). As a matter of fact there were microblades reminiscent of the AST type present in the Bel'kachi neolithic sites on the Aldan: this could have been a parallel development to that discerned by Dikov in the north of Chukotka on the same mesolithic base (either EA- or CK-speaking). One might suggest (without risking too many objections from archaeologists) that Sumnagin-like EA speakers probably acquired microblade technology from remnant Paleo-Arctic people they met already in the Lena valley and it was this that was crucial in allowing them to adapt to hunting on the harsh arctic coast. As the Arctic Small Tool people they were to take this technology to its peak of perfection.

18. According to Clark (1981) the 'Athabaskan tradition' can be traced back to at least 6000 BC in the forested interior of Alaska and probably had its roots in the Paleo-Arctic (or Beringian) microblade culture, descendents of whom were forced back both into Alaska and Siberia, but at least one early site (at Healy Lake, op. cit.:128) already reflects a mixing of Paleo-Indians and Beringians. The relationship between this microblade tradition and the much later Arctic Small Tool tradition he sees as very remote. Krauss and Golla (1984:67) associate Na-Dene with the spread of the Northern Microblade tradition from Beringia down into northwest America by the 5th millennium BC. After about 4000 BC microblades were largely replaced in the interior of Alaska by side-notched points typical of Indian cultures far to the south. It is to this period, with the emergence of distinct coastal and interior sub-traditions, that they assign the Tlingit-Athabaskan split, somewhere in southern Alaska/northern British Columbia. Eyak, representing an inland type of economy coming down to the coast, split off from Athabaskan, they suggest, at about 1500 BC. The Athabaskan 'homeland' they see as somewhere in the broad area covering eastern Alaska/the Yukon and northern British Columbia. Note that no word for 'ocean' or any marine animal can be reconstructed for Proto-Athabaskan (Kari 1989:562). The Northern Archaic people may have returned south (with the forests) in the cooling period that set in before 2000 BC. At about 1000 BC people now recognizably Athabaskan moved into the Barren Lands west of Hudson Bay, replacing an earlier incursion of AST-related people inland from the arctic coast there.

19. These people had toggling harpoons of the kind associated with the Paleo-Eskimo Dorset and Old Whaling peoples (from as early as 1500 BC in the case of the Canadian Dorset and not much later for the Wrangel Island Old Whaling site) - in fact a bronze toggling harpoon head is amongst the finds made from this period in Chukotka. They also had pottery of the earliest type associated with Alaskan Eskimo cultures, namely the Choris phase of the Norton tradition (beginning about 1000 BC). The latter must have received their knowledge of ceramics from Chukotka at this time, but in most other respects their cultural ties are with the southwest of Alaska. Ust-Belayan skeletal remains indicate according

to Dikov (1979:154) that they were physically intermediate between modern Chukotkans (and Eskimos) and Yukagirs. Thus the picture strongly suggests a meeting or mingling of early CK-speaking Chukotkans with already coastally adapted Eskimos.

A more directly ancestral group to the Paleo-Eskimos of the Old Whaling phase on the arctic coast may be reflected in the North Chukotkan variant neolithic culture seen by Dikov in the Amguema River sites (Dikov op. cit. 134), which apparently displays clear links to the neolithic of the Lower Lena. The Ust'-Belayan link to the Lena valley may be more southerly: certainly the greatest linguistic differentiation within the Chukotko-Kamchatkan family lies around the isthmus of Kamchatka, which suggests an original spread northward from this region by speakers of Proto-CK.

20. The 'Old Whaling' culture in evidence at the isolated site at Cape Krusenstern (dated to about 1000 BC) represents an intrusion from the arctic coast of Chukotka, where the related, slightly earlier site at Chertov Ovrag on Wrangel Island was unearthed. Actually 'Old Whaling' may be a misnomer according to Mason and Gerlach (1995) - this pre-ceramic seal- and walrus-hunting people, who did not wear labrets, they term rather 'Chukchi Archaic' since they do not consider it proven that they knew the hunting as opposed to the scavanging of large whales. Ethnically their own term may in turn be misleading.

21. One intriguing piece of evidence suggesting that the Chukotkans were coastally adapted before they took up an inland reindeer-herding way of life lies in the directional terms in these languages, which are basically organized according to coast and wind, just like the earliest Eskimo-Aleut orientation system, before it was adapted to the great rivers of western and southwestern Alaska and brought in that secondary form to the Pacific coast (see Fortescue 1988). Neighbouring Athabaskans have a similar system, applied by the Tanaina to Cook Inlet as if it were a river, just like in Alutiiq, so this may be the areal source of the Yupik riverine orientation system (see Kari 1989:563). Thus the opposition **æjɣə(cqən)** (literally 'windward side') and **ajval** (literally 'leeward side') can be reconstructed for proto-CK (including Itelmen, though here it could be borrowed), the former being 'left along coast when looking out to sea' (hence west for the arctic coast Chukchi and south for Bering Sea Chukchi acc. Bogoras, whose informants represent respectively the reindeer herders of the lower Kolyma and the coastal Chukchi of the Anadyr area). The second term refers to the opposite direction (note that the strongest winds on Chukotka come from the west). Koryak, Alutor, Kerek and Chukchi also have at least one common wind term, ***nikæRjæn**, linked to this system - it is NNW on the arctic coast but NNE on the Bering Sea coast, as in Eskimo; in fact it is probably a loan from Siberian Eskimo (it is no coincidence that the term is known all along the coast to the Kamchatkan isthmus and beyond, where Thule Eskimos are known to have reached).

Contrast the basically up/down river orientation systems of Uralic languages, e.g. Lappish and Vogul ***luwe** 'east or south (downstream)', versus ***wilä** 'west or north (upstream)' (originally 'above, upper'). Kolyma Yukagir has a similar system (south 'up' versus north 'down', with 'east/west' referring to sunrise and sunset); Tundra Yukagir has 'up' as west rather, which may reflect adjustment to

coastal orientation (east is 'behind', south is 'forest' and north 'tundra'). Even when major rivers are not a prominent feature of the environment similar systems are found, as for example amongst the Nganasan Samoyeds of the tundra, who, as described by Dolgikh (1962:292f.), distinguish NE '(lit.) down', SW '(lit.) up', SE 'forest side', and NW 'tundra (or sea) side'.

22. See Fajnberg (1981:140), also Dikov (1979:116). It appears possible that this culture, which seems at one time to have spread far to the west as well as the east, is simply a northern extension of the Ymyjakhtakh culture, associated in its entirety with the intrusion northwards of a 'Baykal' type of people. In that case, as Levin (1963:280f.) has suggested, the latter may represent a major ethnic component in both the Yukagir and the Chukotkan-speaking Paleo-Siberians (also in northern Tungusic populations). These 'new' Paleo-Siberians would presumably in turn have mingled further east with Paleo-Eskimo Arctic Mongoloids to produce the particular physical mixture found on Chukotka today. Physically, note, Levin (op. cit.:282) does not distinguish between Itelmen, Koryaks and inland Chukchi, assigning them all predominatly to his 'Kamchatkan' type, as opposed to the closely related but distinct 'Bering Sea' type typical of Eskimos and coastal Chukchi. In Levin & Potapov (1964:104) it is claimed that the Eskimo type displays some 'Americanoid' traits, whereas the 'Kamchatkans' - especially the Itelmen - display some traits more typical of southern (Pacific) Mongoloids. Admixture with Yukagirs of the 'Baykal' type at a later stage is seen as affecting the inland - but not the coastal - Chukchi.

23. Note that the Verkhojansk mountain range along the eastern bank of the Lena/Aldan system, which cuts off Chukotka and Kamchatka - the Russian 'Far East' - from the Siberian 'mainland', forces a geographical choice between the two routes from central Siberia to the Bergingian Gateway, namely the northern Lena-Arctic Ocean route probably taken by the ancestors of the Eskimo-Aleuts and Yukagir at least, and the more southerly Lena-Aldan-Okhotsk Sea route, which would presumably have been taken when the lower reaches of the Lena were already occupied (as when the pre-Chukotko-Kamchatkans moved up at a time when Eskimo-Aleuts still occupied the area).

24. They were not the first people to hunt whales in the region (the Old Whaling and Ocean Bay peoples have already been mentioned), but the specialization of sea hunting techniques with toggling harpoons and organized crews - around which social life on land was also organized - was specific to them. The Nootka of Vancouver Island were also to develop a similar technology and associated rituals, perhaps independently. The types of whale hunting engaged in by more southerly people usually involved the barbed harpoon (this was true also of the Aleuts, who never had organized whaling crews, relying more on killing beached whales), but toggling harpoons have long been used on Sakhalin and on Vancouver Island, for example, so their use could in theory have been brought independently to America by the ancestors of such northwest coast people as the Nootka (who at contact time still used them) - cf. Crowell (1994:219) for recent evidence of a pre-Ocean Bay maritime culture on Kodiak Island that could represent an intermediate link. According to Vasil'evskiy (1987:77ff) a form of toggling

harpoon was used in connection with sea mammal hunting as early as 7,130 BP on Hokkaido (and the Primorye coast of the mainland opposite), and primitive harpoons dating to a still earlier period in Jomon Japan are in evidence. A toggling harpoon found at an archaic Indian site in Labrador has been dated to 5,600 BC (Fiedler 1992:96). The Old Koryak people appear to have learnt whaling techniques from the Eskimos, but also used huge nets to catch whales, and the Ainu of Hokkaido (as well as southern Itelmen) used aconite poison on their blades. The Aleuts may have learnt this technique from there too, in which case this may indicate some cultural contact directly from the island chain to Kamchatka, although there is nothing linguistic suggesting any such contact, which must have been rather sporadic at best.

25. And Chukchi herders losing their herds settled down on the coast more often than coastal men returned inland (Arutiunov 1988:41). Intermarriage between Eskimos and Chukchi was not extensive in contact times until the beginning of this century according to de Reuse (1994:296-297), but this was more a matter of Chukchi reindeer-breeders looking down on their hunting neighbours and can not be projected back before the introduction of reindeer-breeding.

26. According to Arutiunov (1988:36) these latecomers from the south, who bred reindeer for milking and transport rather than meat and skins like the inland Chukchi, displaced many coastal Koryaks in the early 19th century, forcing them into competition and conflict with inland Chukchi and Koryak herders. They penetrated into Kamchatka in the 1840s according to Levin and Potapov (1964:672). Note, as a curiosum, that the Evenki, like the Buryat, used to hunt seal on Lake Baykal, apparently an ancient occupation there. Okladnikov (1964:51f.) associates the Tungus at a much earlier period with the Glazkovian Bronze Age in Baykalia of the 18th to 13th century BC. Janhunen (1996:216) suggests rather central Manchuria as the Tungusic 'homeland'.

8 Linguistic layering around the bottleneck: from Beringia to the Diomede Islands

8.1. The nature of linguistic bottlenecks

We have seen in the course of our investigation some of the results that have arisen through successive waves of people entering the New World through a specific 'bottleneck', the Beringian Gateway. But just how typical is it as a bottleneck? What can it tell us of the linguistic nature of such geographical configurations in general? Let us compare it with two other bottlenecks, the thin isthmus that connects North and South America, and the passage into northern Greenland from Ellesmere Island.

First the differences: whereas the Beringian Gateway has varied enormously in nature and extent across time (from a plain many hundreds of miles across to a narrow, island-studded strait), and has sometimes been open - though leading to a temporary cul-de-sac in Alaska - and sometimes been closed, either by water or (more seriously) by a mid-Ice-Age climate, the Meso-American isthmus has remained virtually unchanged since man first inhabited the Americas. It is as if the Beringian Gateway has periodically swung open for a while, allowing a few groups of people through, then swung shut again according to the dictates of climate and the limits of human adaptability to its extremes, whereas there is no reason why a steady trickle of humanity should not, from the very earliest stage of colonialization, have passed over to South America more or less continuously. The Beringian bottleneck would probably have permitted the passage of only one linguistic package or 'family' at a time (perhaps two during the widest 'Land Bridge' times no later than 14,000 years ago, when remnant Paleo-Indian groups could have been established near the southern coast while 'pre-Na-Dene' people were beginning to enter interior Beringia), whereas the Meso-American one could have forced a more radical and continual reshuffling of the various groups heading south across it (as well as supported a generally much denser population). It may have acted rather like a funnel producing turbulence - in this case the interference between the languages that reached the southern continent, where they could expand outwards again, splintered and remixed, to produce the complex linguistic tapestry that characterizes the southern even more than the northern continent today (playing havoc in the process with hopes to relate them back to specific linguistic stocks in the north)[1]. If it is true that there were at least four or five separate linguistic entries into the New World, one would expect that the first bottleneck encountered would have left layered traces of the major families or stocks concerned, like successive tide marks, one after the other (and indeed this is the case to some extent). Passage through the second bottleneck, coming on top of the first, would on the contrary have produced the more fragmented linguistic - and indeed genetic - picture one sees in South America[2].

The Greenlandic bottleneck was of course even more selective in its action than the Beringian Gateway: beyond it lay a harsh narrow coastline, the only fanning out possible being the choice whether to take a left or a right turn along it. As it happens, probably all groups of people who passed through the Greenlandic Gateway spoke related languages anyway - but owing to the extinction of all but the last wave of people to enter Greenland there may be no trace at all left in Greenlandic Eskimo of earlier languages or dialects that passed that way. At least there is no obvious sign of

any Dorset substratum (cf. Fortescue 1997b) - we would not in fact know what that looked like. Although the expanding Thule Inuit undoubtedly met remnant Dorset people (they have legends concerning them), this may well have occurred in Canada rather than in Greenland itself, where the last Dorset seem to have kept much to themselves and not to have survived as long as in Labrador. The situation facing the bearers of the Inuit language when they arrived in Greenland was thus more in the nature of a first colonization. Here the concept of bottleneck is stretched to its extreme, and rather than meeting a demographic buildup at its entry, newcomers would generally have moved into a vacuum abandoned by their predecessors.

Yet all three are bottlenecks: although varying on a scale of permeability, they all tend to filter people and languages through in one predominant direction, by and large from areas of higher demographic density to ones of lower density, and to reduce linguistic contact back in the opposite direction. It has long been known that demographic bottlenecks (as well as sheer isolation during long periods on the part of small populations) may effect the gene flow across them by exaggerating internal genetic drift, essentially by allowing a limited, random selection of genes from a larger gene pool through to expand unchallenged 'on the far side' - although this need not involve traversal of an actual geographical bottleneck (cf. Cavalli-Sforza et al. 1988, 6004). The degree to which the Bering Gateway has acted as a genetic bottleneck or not is debated among geneticists - one confusing factor is purely definitional: during Land Bridge times at least the relevant bottleneck was rather between Alaska and continental America[3].

The essential linguistic property the three American bottlenecks share, it seems to me, is the propensity to allow through a limited selection of typological features (borne by specific languages), traces of which may be picked up by succeeding waves of people passing through them - providing, of course, there are survivors left of the preceding passage. The gradual funnelling of diverse language groups into a relatively small 'bridge' area pending their fanning out again on the far side might in turn accelerate linguistic interaction and mixing at bottlenecks (by forced interaction, as it were) - the increase in word order flexibility and mobility of stress placement in languages immediately around the Gateway today when compared with related languages further west within Siberia may be symptomatic of this. The combination of such factors may at all events give an appearance of more rapid internal evolution than actually was the case[4].

Alas, concerning this (for some readers perhaps crucial) question I have little more to add - linguists must ultimately rely on others for an absolute dating of the historical scenarios they construct. It would nevertheless seem consistent with the known distribution of typological features to suspect an increase in the rate of interaction and admixture amongst small groups wandering across the open continental areas of northern Asia as they crossed the bottleneck into Alaska, this once again reducing as the output from the bottleneck fanned out across continental North America. If this is correct in essence, then once again one can only wonder at the great linguistic diversity nevertheless displayed by continental North America - especially the west coast, the probable staging place for most movements eastward, where residual groups of very diverse language type have been drawn into a complex areal 'Sprachbund'. Multiple entries (whether bunched into the 14th to 5th millennia BP or extending further back in time) would seem to provide the only linguistically satisfactory explanation - although a gradual first entry spread over many centuries and

involving small groups with diverse languages is a possible variant picture. If a unified early entry of all but the Eskimo-Aleut and Na-Dene speaking native Americans occurred, one would surely expect a situation (at least as far down as the Central American bottleneck) more like that in Australia, where the vast continental hinterland behind the original gateway area (northwest Australia, with its pronounced linguistic diversity) is covered by one great mesh of typologically and historically interrelated languages (rather like Athabaskan within the American Sub-Arctic, but chronologically probably much deeper). There one finds nothing like the deeply fragmented linguistic landscape of California and the Northwest, over which local waves of diffusion have played for millennia without resulting in widespread convergence. Nevertheless, allowing liberally for the hypothetical accelerating effect of the Beringian bottleneck, it is still possible to envisage a scenario whereby the earliest entry is indeed to be equated with level 7 at Ushki, with one linguistic 'wave' after another jostling to get from Beringia down through the opening ice-free corridor into continental America[5].

At the beginning of this book I claimed that the Bering Strait region constitutes both a 'spread zone' and a 'bottleneck'. It is important to keep these two concepts separated. Amongst the relevant properties of 'spread zones' discussed by Nichols is the 'stratigraphic' record that spreads may leave behind them at their periphery as they near their maximum extent: the periphery may either move forward and capture a new substratum group or retreat, leaving its own trace behind as a layered substratum beneath whatever language moves in from the other direction[6]. Also, successive waves across spread zones often go hand in hand with a movement in the opposite direction of the centre of the spread, eventually drawing in some unrelated language which may become the new centre and in the process obliterate the evidence for the original spread on that side of the zone (Nichols 1992, 19). Thus the general eastward movement of languages out of Siberia in the direction of the New World can be coupled to the counter-movement of its centre of spread since the beginning of the Holocene: from Beringia itself (with the Na-Dene and perhaps Mosan languages) to Chukotka (with the Eskimo-Aleut family), then to the Lena valley in Ymyjakhtakh times (with the pre-Chukotko-Kamchatkan family[7]), and finally to the Altaic-speaking regions of south central Siberia (first Tungusic/ Mongolian, then Turkic).

What I have said above about the general nature of bottlenecks can be restated thus: they combine aspects of both spread zones and residual zones by generally promoting a temporary increase of linguistic diversity on their 'intake' side (a process associated with residual zones) and allowing a restricted selection of typological features to fan out on their 'output' side, which may result in the stabilization of globally unusual features over whole continental masses (a process associated with spread zones). If, however, this leads to impinging on a further residual zone of dense linguistic variety then the newcomers will contribute to still greater diversity in that area. This is indeed what we see on the American Northwest coast: still greater linguistic diversity than on the opposite Asian coast. Of course one must not ignore other, more specifically cultural factors such as the prevalence of slave-taking in the Northwest, which may have increased multilingualism and the diffusion of linguistic traits (Bakker & Grant 1996, 1140).

One could say that there is a continuum between open spread zones and cul-de-sac residual zones, with bottlenecks varying in their position on this scale according to their permeability. The linguistic effects of spread zones and bottlenecks may be very

different: all else being equal, the former geographical configuration (typically a broad flat region, but possibly also a major river valley, easily traversed or followed by successive waves of people and languages) does not encourage language mixing via long-term bilingualism and preserves little if any trace of earlier waves. The reverse is true of constricted bottlenecks, where successive populations and languages are funnelled into forced proximity[8]. On cul-de-sac peninsulas and off-shore islands (extreme kinds of 'bottleneck') this situation can not be overcome other than by absorption and mixture (as in the Kamchatkan and possibly also the Aleutian/Alaskan Peninsula refugia adjacent to the Beringian spread zone), whereas the Beringian Gateway itself was periodically open. The build-up of demographic pressure in the interior of the continent on the western side (however mild compared with further south, where subsistence resources are far less limited) could eventually be released by passage through to the other when earlier people and/or ice barriers moved out of the way.

It is in this way that the Gateway is not typical: depending on climatic and general geographical conditions it has varied in the degree to which it approximates to an open spread zone or to a constricted bottleneck (at the extreme completely blocked). The net result may well have been a northern, periodically open spread zone flanked to the south by a coastal rim displaying many of the characteristics of a residual zone. Maximal bottleneck affects would be expected when either ice blocked the way further into the New World beyond or open sea separated the two continents, while the region would have approximated more to a spread zone when the Land Bridge was at its maximal breadth and there was an open passage beyond into continental America. No particular demographic build-up on the western side would be necessary at such times, just a general drift of mobile hunting groups exploiting the resources of largely vacated regions to the east.

If this is correct, one would expect maximal signs of language contact in the form of borrowing - and at its most intense actual mixing - between successive linguistic waves with the arrival of the (pre-)Chukotko-Kamchatkans in the region, since open sea divided the continents at that time (and these people were not originally coastally adapted like the Eskimo-Aleut speakers who at that stage would have been settled on both sides of the strait, effectively blocking the way beyond). This is in fact what one finds. One possible scenario to explain the typologically and areally aberrant nature of CK - and especially Itelmen - is to see it as representing the complex result of both language shift on the part of a relatively large substratum population already on Kamchatka, adopting the language of a pre-CK-speaking vanguard, and of intense borrowing back from the resultant Itelmen core on the part of successive Chukotkan groups entering the region at the time of (or just before) the influential Tarya neolithic of Kamchatka. On the other hand, the language of the shifting population may directly have affected the target language through bilingualism and borrowing the other way - we may of course never know the details.

Another factor that could have influenced the development of the CK family as a whole away from the US typological mainstream is the possibility of close areal contact at a still earlier time (that of Map 4), namely with languages related to Nivkh. The principal typological divergences between CK and EA may date from that period if there was structural as well as lexical and phonological influence from such languages (resulting for example in the prefixation, root-retraction harmony, incorporation and reduplication that typify CK). Later contact/substratum interference

effects on Kamchatka could in turn have been largely phonological and lexical and limited to Itelmen. The sum total of several such distinct contact episodes could have produced the impression we get today of Itelmen (at least) as somehow being a 'mixed' language. Certainly the ancestors of the Chukotko-Kamchatkans on their way northeast must have encountered more people and languages than the Eskimo-Aleuts before them did along the arctic coast.

At least one parallel known case of shift-plus-borrowing in the region does present itself: the interaction of Chukchis and Eskimos at a later period of intense cultural and economic contact. On top of probable language shift to Eskimo on the part of small groups of Chukchi coming to the settled coasts came strong influence from the demographically dominant inland Chukchi, resulting in considerable lexical and some structural borrowing (notably of subordinating/coordinating particle constructions) from the latter into Siberian Yupik. More recently the shift has been predominantly in the other direction (Eskimos shifting to Chukchi). This, I would claim, represents the typical process that has taken place again and again at the Beringian Gateway: language shift on the part of relatively small groups, as elsewhere in Siberia, followed by the specific bottleneck effects of intensified contact, bilingualism and borrowing. This can be contrasted with the more typical 'spread zone' nature of the North American arctic coast, where there is no evidence of substratum effects from preceding waves of 'Paleo-Eskimos' having left any mark on the Inuit languages brought all the way to eastern Greenland by the Thule Neo-Eskimos[9]. At the much earlier period when pre-Na-Dene speakers may first have spread into Beringia, the ice barrier would still have prevented passage beyond Alaska, and if, as the archaeology suggests, there were people already on Beringia at that time, again forced proximity may have produced contact effects between the languages concerned. These, I would claim, are indeed observable between Na-Dene (especially coastal ND) and neighbouring Mosan languages, and the mtDNA data we have looked at also supports such a picture.

But what of the relationship between the Eskimo-Aleuts and the Na-Dene, where the genetic data again suggests close proximity yet the linguistic data does not? The answer may lie in the fact that at the time when speakers of Eskimo-Aleut appear to have spread across an area previously occupied by pre-Na-Dene speakers, the Beringian Gateway was in a phase where it acted less like a bottleneck and more like a spread zone, since by then the passage down into continental America had long since cleared of ice, and the open Bering Strait would have offered no significant barrier to a population already at least partially adapted to hunting along the arctic coast. The fact that there nevertheless was genetic mixing may simply reflect the relative speed at which language and genes tend to spread: rear-guard pre-Na-Dene groups slowly spreading into continental America would have been overtaken by advancing Eskimo-Aleuts before distance and hostility began to characterize relations between Eskimos and Indians as their very different ways of life developed. Language shift would then, as I have suggested, have produced the otherwise paradoxical situation revealed by the latest genetic investigations. The spread of Eskimo along the arctic coasts of North America is another matter: this was first colonization of an uninhabited ecological niche - there is no reason to expect contact or admixture with anything else.

Precisely since bottlenecks tend to allow only limited linguistic variety through at any one time, they may display the general property of revealing in this manner the diverging speeds of linguistic and genetic spread, even among economically and culturally rather similar small groups of hunter-gatherers as they pass through them

in one direction. Because of the fluctuating presence of the ice barrier blocking passage further down into continental America, the Beringian bottleneck has the specific property of narrowing down likely episodes of passage across it to fairly definite, well-spaced 'windows' (according to the dictates of the arctic climate). Herein lies the hope of grafting our linguistic scenario onto the absolute dating provided by archaeology. We have observed how each successive 'wave' (or perhaps in some instances 'trickle') of newcomers to the American side of the Gateway - as far back as we can distinguish them - must have interacted and mingled with groups from earlier migrations already there, speaking probably unrelated languages. Again and again language shift (with or without borrowing, as cultural, economic and other social factors determined) must have occurred under these conditions to produce the overlap between gene pool and language that we observe in the successive layering of typological traits around the Gateway. And despite the claim of Cavalli-Sforza et al. (1988, 6005) that gene spread and language spread should approach closer and closer to a perfect fit the further back in time one goes, this situation must have applied already in paleolithic Beringian times. Always it is language which has moved faster than genes here: the rear-guard of one wave of people becomes absorbed by the avant-guard bearing a new language behind them.

There is indeed a correlation between genes and language but, I would submit, it is always a delayed, dislocated one (except in the case of first colonialization or of massive population replacement). Archaeologists and population geneticists who ignore this 'delay' factor do so at their peril. Thus when one asks, for example, Who are the Eskimos? Where did their language come from?, one is asking about two very different things (even if we ignore culture, a third parameter, where traits can move even more rapidly than language). The right kind of answer, it seems to me, is something like this: the Eskimo and Aleut populations are the result of a mingling of genes brought by mesolithic newcomers to the Bering Strait region during the last stage of the post-glacial thermal maximum with those of earlier, perhaps pre-Na-Dene groups still present in the region from the days of the Beringian Land Bridge. Their language, on the other hand, has nothing whatsoever to do with the language of these residual Beringians (apart from certain typological features acquired from them through contact and language shift), but is remotely related to Uralo-Siberian languages spoken still on the Asian side of the Beringian Gateway and as far to the west within Eurasia as Hungary. Needless to say, there is genetically probably nothing specific in common between Eskimos and Hungarians.

The 'moral' of all this for investigators studying the complex interplay between archaeology, genes, language and geography elsewhere in the world, is that, all else being equal, one can expect greater language contact/areal affects and even admixture as one approaches constricted bottleneck areas (including cul-de-sac refugia) than in broad 'spread zones', although long-term climatic and geographical changes may alter the mode in which a given area acts at a given period. Language spread through both kinds of region will - apart from during first founder episodes - generally be in advance of the spread of genetically defined populations. 'Bottleneck' conditions can also be expected along coastal corridors where newcomers come upon relatively dense populations already established and exploiting specific subsistence niches (as on the Northwest coast of America and as far south as California), and on large off-shore islands, beyond which successive waves of newcomers have nowhere to go[10].

Let us return, however, to the Beringian bottleneck. What the Diomede Islands -

and their now submerged environs - must have witnessed is nothing less than the spread of human language in all its phases, from first colonization by some Asian founder language, through successive blendings with the languages of newcomers, language shift via bilingual episodes and the gradual absorption of residual groups from earlier waves, to minor backwashes from more successful neighbours and major incursions by the languages of modern, technologically driven states, complicating the picture but not entirely eradicating the evidence, which is etched, as it were, into the very rocks - or the language still clinging to them. In the remaining sections of this book I shall summarize the most 'recent' episodes in this saga.

8.2. Linguistic traces of earlier populations in the region

8.2.1. A Kamchatkan substratum

Since it has been suggested that the Itelmen of Kamchatka may have incorporated certain Indian-like cultural elements and hence may represent a mixing of newcomers ('Paleo-Siberians') with a remnant Beringian population (cf. Dikov 1979, 78 and 126), it is not unreasonable to suppose that the most areally aberrant phonological feature of Itelmen, its ejective consonants, could represent the result of such a substratum effect - compare the ejectives typical of all Na-Dene and Mosan languages. They correspond, as we have seen, mainly to initial clusters of voiceless stop plus voiced continuant or of nasal plus continuant, resulting from the syncope of schwa, still present in cognate Chukotkan forms. Bilingual speakers of some pre-Na-Dene or Mosan language when speaking Chukotko-Kamchatkan might have produced ejectives for such clusters, which - in word/stem-initial position - were alien to Proto-Na-Dene, Haida and some Wakashan at least (cf. Leer 1979, 33 for the former)[11]. It is at all events phonetically not far from a combination of a voiceless stop and a voiced fricative to an ejective (perhaps via assimilation by place of articulation plus voicing onset adjustments). Another such trait that could point towards either Na-Dene or Mosan is the presence of velar/uvular voiceless fricatives in Itelmen (isolated within CK except for adjacent Karagin Alutor, but also typical of Mosan languages)[12].

It seems possible in fact that the whole Chukotko-Kamchatkan family retains traces of early contact with speakers of languages remotely related to Athabaskan. These may include the areally unusual tendency to prefixation (as in all Na-Dene); an indefinite object prefix, also an indefinite/impersonal subject prefix, with passive-like function in Itelmen and Tlingit (proclitic in Haida); the prevalence of adverbial as opposed to morphological evidentials (and of subordinating particles as opposed to inflections). These traits bring CK languages at all events typologically somewhat closer to Na-Dene (plus Haida) than other US languages, all of which are overwhelmingly suffixing and non-incorporating. The traces of an earlier inverse marker throughout the family (historically from the indefinite subject prefix used to form a kind of passive) finds a parallel in the inverse construction of Athabaskan (both typologically isolated traits on the Asian side, also absent in Eskimo), although this also points towards Mosan languages (see below). Finally, the traces of 'affective consonant alternation' in Tlingit (Leer 1990, 79) has a surprising parallel in the CK affective /l/ ~ /c/ alternation[13].

If it were true that Haida represents pre-Na-Dene better than Athabaskan-Eyak

or Tlingit (say before admixture with neighbours in the interior on the part of speakers of Na-Dene proper), it might be that the language responsible for influencing CK was more like Haida than Athabaskan or Tlingit: this language is indeed less head-marking and more evenly prefixing/suffixing than the latter (although it has a profusion of classificatory prefixes it does not mark subject/object pronominals on the verb at all). Recall also the possible parallel between the typologically unusual type of auxiliary verb in CK and certain Haida 'auxiliaries' or 'directive causatives' discussed in 3.1 in connection with Map 11, and the Chukotkan-like 'zero applicative' construction mentioned in connection with Map 30. Moreover, Haida lacks possessive affixes like CK (and unlike ND proper), but shows on the other hand possessor stranding like Chukotkan in connection with incorporated NPs. It also shares an unusual pharyngealized glottal stop with Chukotkan (but note that some Wakashan languages have such stops). Haida may also cast some light on the origin of the numerous prefixes in CK, alone of US languages; thus its preposed 'operators' (some of which are pure causativizers, others partaking of the nature of 'instrumental affixes' - see Enrico 1984, 243) correspond either to incorporated manner adjuncts or to causative prefixes in CK (especially the latter stand out as anomalous within US languages). Also the prefixed subject, antipassive and imperative markers in CK correspond to morphemes (some proclitic) placed immediately before the verb in Haida. The marking in Haida of the definiteness of nouns by a suffix is on the other hand parallelled by the suffixing of the 3rd person pronoun before 'Class 2' nominal inflections (for definite individual referents) in CK[14]. Finally, Haida has an unusual way of forming subordinate clauses by the placing of postpositions directly after verb forms (finite or nominalised), reminiscent of the case-marked verbal stems of CK in similar, adverbial functions (also found in Nivkh and, perhaps through Chukchi influence, Siberian Yupik).

However, on balance, the possibility that the substratum affecting Itelmen - and perhaps CK as a whole - is to be associated more directly with Nivkh, the Paleo-Siberian (or, better, Amuric) isolate further southwest along the Pacific coast, would seem more likely[15]. Like Itelmen, Nivkh allows complex clusters and has largely mono-syllabic verbal stems. Although there is little that points towards morphological commonality (apart from a similar adjective formant **-la** in Nivkh, **-laX** in Itelmen, and the ending **-ŋ** on certain nouns in eastern Nivkh that is reminiscent of one of the CK singulatives), there is a certain amount of lexical material apparently shared by Itelmen and Nivkh that is suggestive of contact at least, as we saw in 6.2.4. Of the 342 Proto-Kamchatkan sets (without Chukotkan cognates) in Fortescue (1995b), none appears to have a Uralic correlate, whereas of the 1,175 Proto-Chukotkan plus Proto-Chukotko-Kamchatkan sets about 95 do. Nivkh also has an indefinite object prefix of similar function (and even form) to the 'antipassive' prefix of CK languages (compare CK **inæ-** to Ni **i-**, which, like the suffix of that form also in neighbouring Ainu, has its origin in a 3rd person pronoun). It also commonly forms transitive verbs from intransitive ones by 'weakening' of an initial stop (often reflecting a lost nasal), with or without a simultaneous suffix **-u-**, as in **faz-u-** 'undress' vs. **p'az-** 'get undressed' or **Xavu-** 'warm up' vs. **q'avu-** 'be warmed up'. This could reflect an original voiced transitivizing prefix like CK ***ðən-**, often appearing as a circumfix with suffix **-æv-** (which can, like Ni **-u-**, also verbalize nouns and adjectives).

Perhaps most significant of all are the traces of earlier root-retraction type vowel harmony of the CK type in Nivkh (as also in Tungusic), mainly the variation of /i/ in

person prefixes with /e/ before stems containing /a/ or /o/ (Panfilov 1984, 411). Thus **e-mq-t'** 'he cut it', where the vowel of the stem, as in **moq-s** 'piece', has been reduced under inflection (a process also found in CK and Salishan). Like in CK, such harmony can work in both directions, as in **ere-rx** 'to the river' from **eri** plus **-rx** (cf. allative **-rox**). The phenomenon of nominal stem reduplication in CK on the other hand (a trait unique amongst neighbouring language families) could represent a purely internal development, although there is some stem reduplication in Nivkh too, mainly verbal but also for distributive plural nominals and in some singular nouns. Thus note western Ni **kulkul-s** 'wheel' from **kulkul-** 'go round', and eastern Ni **pso-fzo** 'dolphin', with regular fricativization of the initial consonant (cluster) in the second half. There are some old reduplicated forms in Itelmen that seem to reflect a similar fricativization process, e.g. **qəlal** 'snow', going with Chukchi **ʔəlʔəl**, Koryak **RəlRəl** of the same meaning, where also the initial consonant is weakened (from ***qəl-** - note that non-initial */R/ often goes to zero in Itelmen). As mentioned in note 13, there are also traces of affective consonant alternation in Nivkh, parallel to that which typifies CK.

Many of these traits Nivkh also shares with the 'Mosan' languages of North America (regardless of whether a genetic relationship can ever be demonstrated). In view of the fact that it also has an inclusive/exclusive 1st person plural distinction and numeral classifiers like many Mosan (and Tungusic) languages, displays traces of the same kind of unusual vowel harmony as found in Salishan, has an n-initial 1st person singular pronominal prefix as in Algonquian and some Salishan (also some Penutian), and lacks genitive and accusative case marking, it appears reasonable to suppose that a link could lie in that direction[16]. Also the minimal differentiation between verbs and other parts of speech, so typical of W and Sa (and unlike either Na-Dene or Eskimo-Aleut), finds a counterpart in Ni with its considerable degree of 'conversion' between nouns and verbs (the same plural marker being added to both, and both being found in adjunct function). Austerlitz (1991, 362) also tentatively proposes a link between Nivkh and Mosan (specifically Wakashan Nootka), although to my knowledge a direct lexical or morphological comparison has never been undertaken between Nivkh and any Mosan language family - perhaps it should.

As we have seen, the feature of incorporation found in Nivkh is another link to Mosan languages; since lexical affixes (like 'suffixing' incorporation) arguably represent a more advanced stage of incorporation, the oldest focus of this typical northwest American trait may lie on the coast with Wakashan and (to a slightly lesser degree) Salishan; canonical noun incorporation - as in Chukotkan - represents a newer phase in this process. Algonquian and Kutenai, with their mixture of both processes (i.e. some noun incorporation as well as predominant lexical suffixes), may represent an intermediate phase, where some incorporates are still relatable directly to independent stems. W and Sa, like CK and also Al, may also 'incorporate' adjuncts, including numerals - compare the Ni numeral + classifier combinations. Traces of contact with a preceding Nivkh-Mosan stratum may further be detectable in coastal Na-Dene (and Haida), in particular in the numeral classifiers and complex consonant clusters (also the presence of some lexical affixes) in these languages[17] - recall the pre-Ocean Bay finds on Kodiak Island mentioned in Chapter 7.

One important trait linking CK and Mosan languages, namely an obligatory indefinite subject type passive or 'inverse' with certain subject/object person combinations, could have been lost in Nivkh if it ever existed there - today it does not even have a passive marker and only very limited person affixes on verbs (recall that

the 'passive' in Salishan is only marked by inflection). The nearest match with the historical CK inverse prefix is the southern Wakashan 'passive/inverse' suffix mentioned in 3.1 under Map 33, whose triggering conditions are also similar (1st/2nd person acting on 3rd, for example). Another potentially significant feature linking Mosan and CK (not present in 'other' US languages) are nominal extending suffixes such as CK **-tkə-** '(on) top of' (further inflectable for case) - these have their analogue in certain Wakashan and Salishan lexical suffixes of location, which may be added to noun-like as well as verbal stems.

In the light of the particularly strong match between the typological profile of Wakashan/Salishan languages and the features distinguishing CK from other US languages (traces of an inverse, stem reduplication, root-retraction harmony, incorporation, distinct 3s subject suffixes on verbs, affective consonant alternations, and considerable prefixing[18]), the possibility suggests itself that a residual 'Mosan' presence on Kamchatka influenced the CK family directly. Elsewhere in coastal Beringia related languages may have produced parallel but independent contact effects in pre-Na-Dene, in particular in Haida, which could have received from its own Mosan substratum both the traits mentioned above that it shares with Itelmen and other Mosan-like traits of its own (notably numeral classifiers and instrumental and evidential affixes), all of which contribute to distinguishing it from Na-Dene proper. This would harmonize with the archaeological evidence of an earlier Mosan-related presence on the Queen Charlotte Islands (see 7.2).

It could thus be that Itelmen reflects a Mosan 'hot spot' that remained for a long time in the Kamchatkan refugium, where such typical Mosan traits as ejectives (and glottalized continuants) were entrenched already before the arrival of (pre-)Na-Dene-speaking people in Chukotka. Such typologically unusual shared traits as pronominal possessor incorporation in Itelmen and Wakashan (although geographically more restricted) strengthen this impression. The picture thus suggests itself of an ancient lower Amur/Sakhalin-Kamchatka-Kodiak Island-British Columbian coastal link all around the North Pacific Rim, in which Nivkh too was involved. Compare Map 4, where it can be seen that Nivkh, Tungusic and Chukotko-Kamchatkan may have been adjacent at some time in the past - this could explain the features common to these languages. It should be borne in mind, however, that many languages - and whole families - have probably been lost (or have moved on to America) in the coastal area betweem Hokkaido and Kamchatka (via Sakhalin), where only Nivkh remains of an undoubtedly once complicated linguistic picture before the arrival of Tungusic languages throughout the region.

8.2.2. Other early trans-Beringian strata

It seems that a better case for deep affinity can be made between Na-Dene and Yeniseian Ket (and perhaps further to Tibetan, as the Nostraticists believe) than between either of these and Nivkh and/or Mosan: compare the prefixed (or preposed) possessor and subject/object markers, the marked contrast between complex verbal and simple nominal morphology, the tones (tied up with the historical distinction between glottalized versus plain syllables), the presence of subordinating particles, the uvular consonants, the covert noun class agreement prefixes on verbs, and the suppletive singular/plural pairs of some verbs shared by both families. Note also the

presence in Ket as well as ND of opaque morphophonemic linking elements in the verbal complex[19], the lack of indicative or subordinate verb forms based on participles and of vowel harmony (both unusual negative traits in Ket, given its mid-Siberian location), and the stative/active orientation of both (the last trait is overt in Tlingit, also Haida, but vestigial in Ket - cf. Šabaev 1986). Although Ket does not have ejectives, there are injective allophones of certain stops (and Starostin 1982, 231 suggests that certain voiced stops in Ket could have developed from pre-Yeniseian ejectives). Most significant of all are the unusual discontinuous stems or 'themes' of both families, with infixed subject and tense/aspect affixes appearing between the elements[20]. The largely monosyllabic verb stems and the presence of noun incorporation in both families are on the other hand shared with Nivkh and Mosan languages as well.

Some of these typological features could represent parallel developments from a common starting point, and once again I should repeat Nichols' point that given a broad enough time frame typological traits may appear to move - or stay put - with a life of their own, detached from specific families, so the relationship between Yeniseian and ND could be rather indirect. To my knowledge, no mtDNA study to date has included Ket - such data might eventually cast some light on the possible Na-Dene affinity.

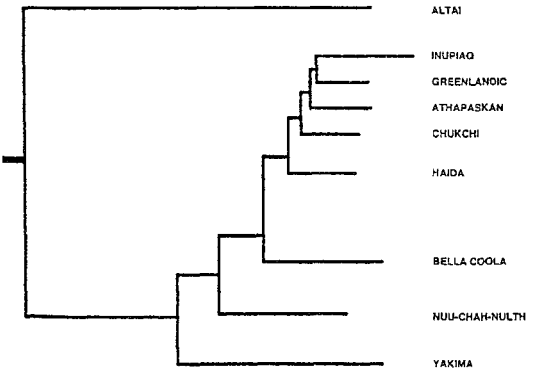
Concerning the geographical origin of pre-Na-Dene (as opposed to Na-Dene proper), little can be said with certainty, but it is not unlikely, given its association with the Paleo-Arctic microblade tradition and the typological clues pointing in the direction of Tibetan mentioned above, that it is to be found on the 'Mammoth Steppe' that once stretched up into central Siberia from the plateau of Tibet (cf. Guthrie 1996), rather than further down the Asian coast. The Yeniseians could have originated in the same general area (see the insert to Map 2). The highly prefixing morphology of the Na-Dene languages with elaborate stem-variation and discontinuous morphemes is at all events very unlike either Proto-EA or Proto-CK and more like that of Ket[21]. Whatever the truth of the matter may be, it seems likely, as discussed in 3.2, that some proto-language ancestral to Na-Dene was responsible for bringing certain typological traits also reflected in western Siberia into the Beringian area, traits that have spread, or have left their mark as substratum effects on what followed.

It has often been said that Athabaskan languages are exceptionally conservative, spreading their influence wherever they have came into contact with other languages but not being affected much in turn by them (although their speakers have been highly adaptable culturally - see Sherzer 1976, 226). The family is certainly highly distinctive and more homogenous than, say, Salishan. This has probably been exaggerated, however, and may simply reflect the fact that the Na-Dene languages represent the latest 'Indian' family to arrive in continental America, or at least reflect a recent, rather rapid spread. In fact, Athabaskan languages could in theory have picked up traits like noun incorporation (though this is also found in Ket) and/or obviation from contact with Algonquian neighbours to the south, possibly in connection with the expansion of Northern Archaic people from the continental south, whose influence at least reached as far as the shores of northwest Alaska long before the Eskimos did[22]. The complex but rigid slot-ordered morphology of Athabaskan verb forms is on the other hand very different from the recursive morphology of Algonquian languages, where stems can be successively nominalized and reverbalized several times (like Eskimo on this parameter). Leer (1991), note, assumes a common inland origin for the

two branches of Na-Dene proper, one not shared with Haida.

As regards still earlier linguistic strata within North America and their possible links with Asia, one can only speculate, though it is tempting to envisage the typologically very different Penutian languages (whether or not related further to Mayan), with their much more dependent-marking, Eurasian cast than anything else on the northern continent, as reflecting a wave immediately preceding the hypothetical 'Mosan' one (cf. the discussion in Shields et al. 1993, 557f. for the marked break between Mosan Nootka and Penutian Yakima as regards mtDNA affinity, and compare Figure 5). Within the Mosan mesh, Salishan, with its many clitics and particles, has perhaps been affected by its prolonged contact with Penutian languages more than Wakashan has (and coastal Salishan at least is somewhat more dependant-marking, like Penutian, than is Wakashan). Hokan (whether or not linked to Siouan and/or other more easterly families) would presumably represent a still earlier one. Deep links between both of these hypothetical 'stocks' and Meso-America (and even South America), where polysynthetic and relatively analytic languages are found side by side, have been proposed, but none find much support amongst specialists today.

FIGURE 5



Inferred family tree of the mean pairwise sequence differences between mtDNAs of sample populations (Shields et al. 1993)

Altai = Central Asian Turkic; Bella Coola = Salishan; Nuu-Chah-nulth (Nootka) = Wakashan; Yakima = Washington State Plateau Penutian

The mitochondrial DNA link between southeast Asia and the Americas, mentioned earlier in connection with mtDNA lineage B, points towards the Hokan and perhaps other people of southwest North America who may have preceded speakers of Mosan languages into the continent (Lorenz & Smith 1994, 778)[23]. See Nichols & Peterson (1996, 337) for an interesting discussion concerning the 'Pacific Rim' distribution of n-initial 1st person markers and m-initial 2nd person ones, specifically for the possible link between Penutian and Austronesian/Melanesian languages

(amongst speakers of which mtDNA lineage B is strongly represented). This picture is not incompatible with an ultimate source for all ancestral North American natives on the Asian 'Mammoth Steppe', in so far as early expansions of Paleo-Mongoloids to the Asian coast could have brought lineages other than A both to the New World and to southeast Asia (say during the last interstadial), without any actual south-to-north migration along the coast. Lineage A, rare in southeast Asia, is by contrast probably to be correlated with the Neo-Mongoloid expansion when people moved north in growing numbers during Holocene times (and groups associated with advanced projectile points expanded once again towards America).

8.2.3. Possible Alaskan substrata

Un-Eskimo-like traits in Aleut that could be indicative of a Na-Dene-related substratum include the use of auxiliary verbs for forming specific tense/moods (as in Tlingit) and in general the obligatory marking of indicative tense (apart from 'general' statements or questions) as in all ND and Haida (also CK); the 'promiscuous marking' (Leer's term) of subject/object number on the verb rather than on the NPs concerned (a head-marking trait especially striking in Eyak and Haida, also found to some degree in Ket)[24]; the use of an independent 'be' verb (Aleut **a-**), as in Athabaskan, rather than a 'have' suffix as in Eskimo in existential constructions; and the Aleut practice of giving people names consisting of whole phrases (as well as single common nouns), a practice also known among Athabaskans (Jim Kari and Victor Golla, pers. communications). Another important feature (because typologically rare) is the presence of internally headed relative clauses in both Na-Dene and Aleut, a phenomenon more common amongst strongly head-marking SOV American languages and not, for instance in Eskimo or Chukotko-Kamchatkan - or Salishan/Wakashan - languages (Eskimo, like CK, has participial relative clauses of the typical northern Asian type). There is also a parallel ambiguity between subject and object relativization when the verb of the relative clause is transitive[25].

As regards the absence of the labial stop in Aleut discussed earlier, this could of course on its own represent an independent development - note the */p/ to /h/ or /f/ development in Japanese and Tungusic for example. Roman Jakobson suggested already in 1944 that the phenomenon may have something to do with the wearing of labrets amongst Aleuts and other Northwest coast peoples, although their nearest Yupik neighbours also used to wear labrets but did not lose their /p/ (cf. Bergsland 1997, 6). The trait should be considered in conjunction with a less common trait in common with eastern Itelmen and (in part) Na-Dene, namely the lack of initial nasal obstruents (except when due to later loss of an initial vowel). This development, whereby initial */m/ and */n/ become /p/ and /t/ respectively, must have predated the change of */p/ to /h/, since also Eskimo initial */m/ corresponds to /h/ in Aleut[26]. For Proto-Athabaskan as reconstructed by Leer (1979) the only nasal obstruent (distinct from nasalized semi-vowels) is /n/. Note that /m/ is secondary (deriving from */w/) in those Athabaskan languages that have it (e.g. Lower Koyukon, Holikachuk, Sarcee, Northern Tutchone and Hupa); also Eyak /m/ is secondary (from */wVn/ - cf. Krauss & Leer 1981, 59f). Some of these are adjacent to Eskimo-speaking areas: the change could also have typified the language that Alutiiq (Pacific Eskimo) replaced. The lack of the (initial) labial nasal in Na-Dene (as also Haida) could, as a substratum trigger, have led to the merger of */m/ and */p/ (as /p/, later

changing to /h/), in turn affecting the other initial nasal, /n/ (which became /t/)[27]. As Bergsland points out, initial EA /n/ before /i/ was dropped in Aleut and Yupik before the change of */n/ to /t/, so this seems to represent an innovation in southwest Alaska predating the hypothesized contact of EA speakers with (pre-)Na-Dene speakers on the Aleutian Peninsula.

Finally, the 'verb complex' of Haida in particular, a succession of loosely concatenated verbal and adverbial morphemes with cumulative modal/tense inflection on the final element, is reminiscent of the 'flat', inflectionally cumulative syntax of Aleut chained clauses (although Haida of course lacks the subject/object agreement markers of Aleut final verbs)[28]. It is possible, then, that Haida may have been genetically related to the language of the Anangulans, both part of a diffuse continuum which was broken by the arrival of the Aleuts and later of the Tlingits on the Pacific coast. This local continuum could have overlain a still earlier, coastally adapted, labret-wearing North Pacific Rim population, as suggested above (recall from Chapter 3 in connection with Map 26 that also Proto-Salishan may have lacked a labial stop). See Dumond (1987, 43f.) for an overview of the physical anthropological evidence pointing towards a close connection between the Aleuts and the even more closely linked populations of Kodiak Island and the American Northwest Coast, closer than that between Eskimo and any of these groups, despite the linguistic situation today.

It has been suggested by Bergsland (most explicitly in Bergsland 1997) that the ultimate source of the far-reaching morphosyntactic reshaping of Aleut is actually the collapse by apocope of the distinction between certain nominal case endings (specifically the /m/-initial relative, locative and ablative-instrumental case endings reconstructible for Proto-Eskimo-Aleut) that are essential for distinguishing the ergative and accusative transitive clause constructions of Eskimo. These changes he disassociates from any substratum or contact influence. However, the apocope in question was not a general sound change within Aleut, merely a tendency, part of a wider sporadic phenomenon of syncope that produced un-Eskimo-like clusters (a trait parallelled by Itelmen vis-à-vis Chukotkan - and perhaps reflecting a similar kind of substratum effect). As regards final vowels, Aleut specifically retains only final /a/ from Proto-EA (and even that is lost in demonstratives such as **uka-n** from ***ukana**). Final /u/ merges with /a/, and final /i/ (the crucial vowel here since it is found in the EA locative **-mi**), is actually only relevant in Aleut to case and number inflections since all EA nouns ending in /i/ now have a singulative **-X** attached (and /i/ can never be word-final in a verb). In fact it was apocopated in the locative case ending concerned but is preserved in (older) Eastern Aleut 2p ending **-ci**[29]. Perhaps one can, after all, point to the thorough head-marking nature of neighbouring Na-Dene languages as at least one possible factor in the attrition of nominal case marking in Aleut: note that Aleut has largely made up for the losses in question by enforcing strict SOV word order and developing its stock of postpositions, traits also characteristic of Na-Dene.

At all events, 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 (something we recognize from the history of more familiar languages such as English). Perhaps this is after all a general property of linguistic change, with episodes of rapid change typically sparked off by contact or other external factors. Such a factor could in the case of Aleut have been physical disruption,

although the decimation and reshuffling of the population by Russian colonializers occurred perhaps too recently to be responsible since the earliest records already show typical Aleut morphosyntax (K. Bergsland, pers. comm.). Alternatively, one suspects relatively rapid language shift by a substratum population, which, as I have suggested, may well have been rather common in the Beringian area already in Arctic Small Tool times. This is not to say that Aleut, as an otherwise normal language, did not adjust to whatever 'abnormal' changes it may have been subjected to and reach a new internal equilibrium - nor that sheer isolation combined with internal mobility could not have accelerated developments within Aleut, as seems to have been the case with East Greenland for example (cf. Fortescue 1997b).

All in all, the Aleutian Islands would seem to constitute a less pronounced form of 'residual zone' than Kamchatka (where there is far greater linguistic diversity, even today, with the latest arrivals being Koryaks and Evens). They represent, however, the extreme periphery of the Northwest coast of America, which itself constitutes a single residual zone according to Nichols (1992, 21), mirroring the residual zone of the Asian coast that at one time may have stretched from Japan to Bering Strait on the opposite shore.

One of several areal traits covering the whole of Greater Beringia that may have been picked up by Eskimo-Aleuts - the easternmost speakers of a Uralo-Siberian language - from 'pre-Na-Dene' Beringians as they entered Alaska is the presence of a phonemic uvular stop /q/ and corresponding voiced fricative. These (as opposed to uvular allophones of velars in the presence of back vowels, as in the eastern dialects of Even and in Yakut[30]) are limited on the adjacent Asian side to all EA and CK languages and (modern) Yukagir. They are also typical of Na-Dene languages, being reconstructible for Proto-Athabaskan (as well as Eyak, Tlingit and Haida) - though they have been lost again in most Athabaskan languages that do not have Eskimo neighbours (Krauss 1976, 327). The trait may in turn have been acquired by incoming pre-Na-Dene speakers from still earlier remnant groups still in the region (or reinforced by contact with them). Another such trait is the presence of a phonemic voiceless /ɬ/ contrasting with a voiced lateral, found in all EA and (among a general plethora of laterals) in all Na-Dene[31] - and Mosan - languages and, within CK, only Itelmen and Chukchi (the latter probably under direct Eskimo influence). Also distributive verbal affixes, morphological applicatives, indefinite object affixes, alienable/inalienable possession marking, and reflexive versus plain 3rd person possessive affixes are shared by EA and most American languages of the Northwest. Finally, phonemic schwa is another good candidate for a Beringian Gateway trait, with its area of greatest saturation (long as well as short, stressed as well as unstressed) this time lying on the Asian side - plus the Diomede Islands[32].

All these features could reflect the cumulative influence of successive linguistic waves passing through from west to east, inherited by Eskimo-Aleut as a whole. We have also seen how several typological gradients runs right across the region, notably the prevalence of head versus dependent marking (as investigated in Nichols 1992, 180f). Eskimo-Aleut, with its pervasive double marking of head and dependent constituents stands half way between typically dependent-marking Uralic languages (with developed case systems) and typically head-marking Athabaskan languages. Yukagir goes with Uralic on this dimension and Chukotko-Kamchatkan has a somewhat greater tendency to head-marking[33].

In sum, it seems to me that the only reasonable explanation for the paradox of the

physical/genetic closeness of the Alaskan Na-Dene people and the Eskimo-Aleuts (also the Chukotko-Kamchatkans) and yet their great linguistic divergence lies in language shift, specifically in a portion of remnant pre-Na-Dene speaking Beringians switching to Eskimo-Aleut. This is the mechanism whereby 'Beringian' linguistic traits would have been inherited by Eskimos and Aleuts. Unfortunately, very little is known of contact between Na-Dene and Eskimo-Aleut speaking people in prehistoric times, although something can be inferred from patterns of cultural exchange and intermixing across ethnic and linguistic boundaries in recent centuries, especially in southern central Alaska (cf. Clark 1981, 120ff). There are also, as one might expect, important physical differences between Eskimo-Aleut and Na-Dene people, e.g. the prevalence of the so-called Naskapi albumin mutation in a high percentage of Athabaskan and Algonquian people (also, according to D.G. Smith, pers. comm., in Wakashan and Salishan populations) but absent amongst Eskimo-Aleuts (cf. Schell & Blumberg 1988, 4)[12]. The survival advantage brought by the newcomers from Siberia may have been the technological innovation of the bow and arrow (utilizing fine projectile points of the AST type - cf. McGhee 1988, 373), combined with at least partial adaptation to arctic coastal subsistence - which had become a serious matter in the hinterlands left by dwindling Beringia.

8.3. The Uralo-Siberian expansion

Let us turn now to the succeeding wave itself, the main subject of this book. We have seen that the picture that emerges from a reexamination of the relationship between the Chukotko-Kamchatkan and Eskimo-Aleut languages is one of complex and long-term interaction. Widening our horizon to include both Yukagir (only reconstructible from the surviving two languages to a relatively shallow depth) and Uralic (which has been reconstructed to a very considerable time depth, about 6,000 years according to Décsy 1990), a common source for all these languages was discerned in the spectral entity I have called 'Proto-Uralo-Siberian'. A comparison of the approximate time depths assignable to the individual proto-languages suggests, in conjunction with the light cast by the archaeological perspective, that Proto-US might have been spoken somewhere between 8,000 and 10,000 years ago across a wide area of the forested regions of southern Siberia centred on the region between Lake Baykal and the Sayan - the probable homeland of the Uralic Samoyeds - and extending eastward up the Lena/Aldan valleys and westward almost as far as the Ob.

Now the Sayan region in particular (the foothill area stretching from the upper Yenisei to Lake Baykal) has as far back as we can project always constituted a linguistic 'area', geographically hemmed in between the boreal forests to the north and high mountains to the south. At the same time it is an important cross-roads between two very different worlds, the steppelands further south and Siberia proper to the north (accessible by the great river system that has some of its major sources here). Successive peoples - Yeniseian, Samoyedic and Turkic at least - have moved into the area and found long-term economic niches, a situation only relatively recently obscured by the arrival of the Russians. If the language spoken immediately north of the Sayan mountains at a certain time began to expand outwards, eventually to cover most of Siberia, it would have had its roots in a mesh focused in this area but would have approximated to a unitary proto-language as it expanded via the adjacent spread zone.

This language, expanding from southern Siberia, could have engendered the last

linguistic wave to reach America in prehistoric times. In doing so it may have absorbed or displaced remnant Paleo-Mongoloid big-game hunters, forcing some of them westwards (the Yeniseians?) but most of them eastwards (various pre-Na-Dene groups?). Given a fairly homogenous mesolithic way of life throughout the forested zone of northern Eurasia at the time, it is geographically not surprising that a linguistic stock - or tightly interconnected mesh - originally located in the middle of the continental mass should, as demographic increase outstripped subsistence resources, have expanded in all directions (except to the south, where different, technologically more advanced economic developments were underway and contact may have been primarily hostile). All else being equal, languages expanding outward from the centre of a land mass should have a better chance of continuing their expansion unhindered by geography than is the case with coastal languages, which can of course only expand inland (although favourable conditions for demographic expansion on coasts may counteract this tendency, at least at more southerly latitudes or during the initial colonization of continents). Uralo-Siberian just happened to be in the right place at the right time for an expansion which, during the period of post-glacial warming, took it far beyond the confines of the homeland of its original ethnic bearers. Following the major river valleys, first one then the next sub-group moved away from the centre, to produce what subsequently was to become Proto-EA, Proto-(or rather pre-)CK, Proto-Finno-Ugric, and finally, the last to leave, Yukagir, leaving only traces of Samoyedic (much transformed from Proto-Uralic) behind in the original homeland. As is often the case, the most conservative representatives are the most peripheral ones, Balto-Finnic in the west and Eskimo in the east, hence the early recognition of 'something in common' between these two branches, while the related languages in between proved less easy to fit into the picture[35].

The original Uralo-Siberian mesh would have displayed a constellation of typological features consistent with its projection up to all the present-day languages, though any of them could - and did - become lost or replaced en route within specific families. Candidates for these features include: basic SOV word order; simple agglutinating morphology (suffixing only); bisyllabic stems with limited (medial only) clusters; a palatal series of consonants; non-finite subordinate clauses; the distinction of singular/dual/plural number on nouns; indicative verb forms based on participles (3rd person subject intransitive at least); (some) personal possessor suffixes on nouns; modifiers before head nouns, possessor before possessum nominals, and the presence of postpositional constructions (these tend to fall out from SOV order); simple case marking on nouns (locative, ablative and dative/lative at least); accusative-nominative clause orientation; no subordinating particles or pronouns; and only voiceless stops and voiced fricatives (further, less widely distributed traits have been mentioned under 3.2).

Although some of these traits (such as SOV word order) are common amongst the world's languages, the exact configuration is hardly so, and the last of them in particular is typologically unusual (Sherzer 1976, 257) - it has been recreated for all the individual proto-languages concerned, EA, CK, Yukagir, and Uralic, but not, for instance, for the three Altaic proto-languages. As mentioned in Chapter 1, languages with such a consonant inventory display a natural tendency to develop - or reflect the historical result of - 'consonant gradation', whereby voiceless stops alternate with the corresponding voiced fricatives in 'weak' positions (a process of great historical importance for especially Balto-Finnic and Eskimo[36]). The later development of voiced stops in Yukagir and various Uralic languages and of voiceless fricatives in

Yupik and Aleut (and some Inuit) is rather easily explained, as is the development (parallel but probably independent) of transitive verbal paradigms, of elaborate case systems, of prefixes and circumfixes, and the full exploitation of polysynthetic derivation in the one language family or the other, all of which can be reasonably charted from such a base line. Also of particular significance is the prevalence of indicatives based on participles, which so typifies northern Asia and which is represented on the American side of the Gateway only by Eskimo-Aleut. Another conceivably original feature is palatal vowel harmony of the type reconstructible for Proto-Uralic (and for the Turkic and Mongolian proto-languages), but, as has been discussed in 6.1, there is reason to believe that this was not in fact one of them[37].

Uralic as a whole remains closest to this original profile, although western Finno-Ugric has been strongly affected by neighbouring Indo-European lexicon, SVO order and finite subordinate clause types, Balto-Finnic also acquiring relative clauses with relative pronouns, and Hungarian developing a definite article under Indo-European influence. Eskimo-Aleut, although archaic in reflecting a pre-vowel-harmony stage, has gone far in the direction of the elaboration of its suffixing potential. Samoyedic (and to a certain degree also Ugric and - as regards the vowels - Permic) has also innovated significantly away from the original Uralic profile, losing vowel harmony through various cumulative vowel shifts and mergers but developing instead an inflectional system of stem ablaut and consonant alternations of its own, replete with irregularities reflecting earlier vowel harmony pairs[38]. Yukagir has developed an innovative system of grammaticalized focus and may have lost its original possessive suffixes.

Chukotko-Kamchatkan languages seem to represent the result of contact between the morphologically rather simple agglutinative proto-language hypothesized and some other language(s), possibly of pre-Na-Dene but more likely of Nivkh and/or Mosan type, which displayed areally unusual traits that left their mark, especially on Itelmen. The latter could in fact represent what Trudgill (1996, 12) has called a 'reverse creole' (the result of language shift). Probably the more southerly route taken by the bearers of early or pre-CK speakers compared with that taken by speakers of Proto-EA brought them into more complex contact situations (and with larger remnant populations pockets). Whether CK (or part of it) can be called Uralo-Siberian in a strictly genetic sense depends in part on one's definition of historical relationship: the answer may be 'yes' if one considers core morphology and regular phonological correspondences between a restricted number of potential cognates as sufficient criteria, 'no' if one regards 'mixed' languages - if existing at all - as altogether beyond the pale of true genetic relationship. Perhaps the most neutral answer is to suggest that pre-CK may have represented a branch of the US 'stock' (or a part of the original Sayan mesh at least) like any other, but that strong admixture with some other language(s) in - or on the way to - the Kamchatkan area produced the modern languages, parallel to the relationship I presuppose between pre-ND and ND proper. There may be a further parallel with the situation of Japanese further south vis-à-vis neighbouring Altaic languages.

It is worth considering at this point the alternative possibility, that Chukotko-Kamchatkan should after all be more directly connected genetically to Nivkh - and thus perhaps to an ancient mesh of Pacific Rim languages stretching as far as the Wakashan and Salishan languages of the Northwest Coast. On this hypothesis it would have been mainly lexical and phonological input that pre-CK received from contact with Uralo-Siberian, presumably in the form of Eskimo-Aleut speakers already in the

Chukotka/Kamchatka area when they arrived. Of course this hypothesis does not at present enjoy the same degree of morphological and lexical foundation as the first one, but this may yet be established in the future - let us imagine that the lexical evidence will indeed become more evenly balanced. In such a choice between two equally plausible hypotheses of genetic relationships (where distinguishing between early loans and cognates is hardly feasible), the typological profiles of the languages concerned, stripped of clearly diffused areal features, must surely be crucial. The bundle of features that CK shares with EA and the other US languages is arguably more fundamental than the traits it shares with Nivkh and/or 'Mosan' languages. By this I mean that the latter can reasonably be explained as additions or adjustments to the original US profile, with each divergent feature having a plausible origin in terms of contact phenomena, whereas it is difficult - or at least much more complicated - to envisage a language group displaying an 'Amuric' and/or 'Mosan' profile borrowing those US features that CK languages display today. For instance, how would such a language acquire the feature of indicative paradigms based on participles (as in US) when participles[39] are not even found in the hypothetically related families? And why should it shift from a more typologically neutral array of voiced/voiceless stops and fricatives to the more marked US configuration of only voiceless stops and voiced fricatives?

It is nevertheless true that languages can borrow typologically marked features from neighbours (we have seen this with the apparent borrowing of ergativity in Chukotkan languages from EA). In the final instance it seems to me that this is the kind of case where archaeology and population genetics have a legitimate (if subordinate) role to play in historical linguistics: between two competing hypotheses of linguistic relatedness that which best matches the evidence for prehistoric population movements and spreads (allowing for the important intervening factor of language shift) should for the time being be given the greater weight[40]. The emergence of CK, showing evidence of successive layered contact effects (the last of which - before the arrival of the Russians - was probably the influence from Eskimo on Chukotkan speakers as they moved north), may in any case typify the complex crystallization of 'new' language families in the bottleneck area before they cross over to the New World. Once they do, that increased diversity may be exported from Asia into America, as Austerlitz proposed.

Other more local movements and minglings amongst people speaking one or another Uralo-Siberian language took place subsequently to the main mid-Holocene spread, but I shall concentrate in the rest of this section on occurrences around the Beringian Gateway itself prior to 'contact'.

Kaplan (1985, 204) discusses the clear evidence for a Yupik substratum - specifically of the Unaliq dialect of CAY - beneath the Seward Peninsula dialects of Inuit Eskimo. This is manifested mainly prosodically, but also involves the preservation of PE schwa in the Diomede dialect and of /c/ in Fish River Qawiaraq, and the lengthening of vowels in certain words where the equivalent Yupik word has a lengthened vowel. He suggests that the Unaliq Yupik people of the southern half of the peninsula shifted to Inuit owing to intrusions from the north (less than 500 years ago) that broke an earlier Yupik continuum across to Chukotka. Since this influence is less marked in the case of the Qawiaraq dialect, he hypothesizes that this represents a more marginal (inland?) group that moved to the south coast of the peninsula still later. Unaliq Yupik in turn has an innovative fortis/lenis distinction in its consonant

system that reflects the consonant gradation in Seward Peninsula Inupiaq corresponding to the alternate syllable dynamic stress of its own typically Yupik prosodic system[41]. If Krauss (pers. comm.) is right in seeing Naukanski Yupik on the tip of Chukotka as a late arrival from Alaska, its bearers must have moved on from the Seward Peninsula and adjacent islands before the arrival of both the Inuit speakers presently there today and the Unaliq speakers of Alaskan Yupik they mingled with.

The Bering Strait dialect of (Seward Peninsula) Inupiaq, as described by Kaplan (1990, 143), is of particular interest, straddling as it does the Beringian Gateway. It both preserved certain ancient distinctions in the language elsewhere lost in the Inuit dialects (mainly certain consonant clusters and the presence of phonemic schwa, still fully preserved - and indeed extended by assimilation at a distance - in the Diomede sub-dialect), and has at the same time undergone considerable influence from Alaskan and Siberian forms of Yupik Eskimo (and through the latter even Chukchi). Especially the sub-dialect spoken until recently on both the Diomede Islands, the tiny stepping stones half way across the strait, reflects the to-ing and fro-ing of people in both directions that must always have characterized the immediate vicinity of the Gateway. This was principally for the purpose of trade (certain types of Chukchi reindeer skins were in particular demand amongst Alaskan Eskimos), but there was also warring and raiding. The prevalence of bilingualism (or even trilingualism) in the Seward Peninsula area between different varieties of Yupik and Inuit is notable (overlain today by English, just as Russian has overlain an already existing and still greater proclivity to bilingualism on the Asian side[42]). In fact, the Diomede sub-dialect can itself be said to be built up in layers by the accumulation of successive waves of influence from either side (and preceding forms of Eskimo once spoken there must surely also have undergone such influence). Basically, it derives of course from the common Proto-Inuit language of northwest Alaska, but it rests upon a Norton Sound (Unaliq) Yupik substratum, which has strongly affected its phonology and to a lesser degree also its vocabulary. On top of that came further Yupik influence, this time from the Asian side, as we saw in 6.3.

The most important development in the area - one involving more than one Uralo-Siberian family - was the continuing interaction of Chukchi and Siberian Yupik, mainly with the latter as the receiving party. The linguistic dominance of the Chukchi, note, is not only - or even primarily - due to a more aggressive nomadic way of life vis-à-vis sedentary coastal people, but also reflects the fact that the Chukchi, being people of the interior, must always have been more monolingual than the bi- or trilingual coastal Eskimos of Chukotka. In such a situation it is the coastal people who will naturally switch to the interior language in situations of direct communication, so all else being equal - and helped along by intermarriage - the inland language can be expected to gradually expand its domain also on the coast[43]. Two specific variants of the mechanism involved can be supposed to have played important roles then as now: first, the abrupt shift occurring (from one generation to the next) when the offspring of a bilingual coastal woman, taken inland as bride by a monolingual Chukchi, are brought up in a purely Chukchi-speaking nomadic environment, and (b) the gradual shift occurring in the coastal villages when the offspring of bilingual, ethnically Eskimo coastal dwellers acquire, generation by generation, a form of Eskimo that is a little more Chukchified than that of their elders. These would come to speak more and more Chukchi (as opposed to Eskimo) through increasingly frequent communication with their monolingual Chukchi-speaking peers (at first often the children of Chukchi

men who had lost their herds or chosen to trade along the coasts). In the final instance, if monolingual Chukchis continue to move to the coasts (a process accelerated under Russian administration), the latter scenario can lead to a complete language shift in the community. Since borrowing will have proceeded in both directions all the time between the economically distinct populations, clear lexical evidence of the shift can be expected to remain, as well as some phonological and even slight structural interference from Eskimo[22].

Chukchi influence has been strongest in the case of Sirenikski, once probably spoken all along the south coast of the Chukotkan peninsula but now extinct (the last speaker died this year - 1997). The languages spoken in the village of Sireniki today are Central Siberian Yupik and Chukchi, in which most villagers must have been bilingual for some time (also of course Russian). As recorded by Menovščikov in the fifties (Menovščikov 1964), this aberrant form of Eskimo, probably representing a third branch alongside Yupik and Inuit, was already heavily influenced lexically by the majority CSY language. As a peripheral form of Eskimo, it shows the mixture of archaicisms and influence from non-Eskimo neighbours that one might expect. It is not known how long this language has been spoken on Chukotka, whether it represents the language of Eskimos who never left the Asian side, or an early wave of Eskimos back from the Alaskan side in Neo-Eskimo times. In either case they may have been displaced towards the west by incoming speakers of CSY. The name of the principal settlement associated with the latter language - Ungaziq (Chaplino) - may reflect the earlier Sirenikski pronunciation of the common Eskimo place name **ungaliq** '(place) on the far side'.

As with Diomede Inuit, Sirenikski displays layering that reflects its special historical and geographical position. Alone amongst Eskimo languages it has never developed diphthongs by the dropping of intervocalic fricatives, and unlike Yupik languages (especially the Alaskan varieties, which have completely lost it) it has preserved original */ð/ (as /ɾ/ alternating with /c/) in all positions. Although today it has adopted the rhythmical dynamic stress of CSY, this is grafted onto an original, quite un-Eskimo system of prototonic syllable stress of its own, relatable to the usually stem-initial syllable stress of neighbouring Chukotkan languages. Most following full vowels - except those protected by original geminates and certain suffix-internal and final vowels (cf. Rasmussen 1995, 419ff) - went to schwa, although, like Yupik and Aleut, it lost its geminates as such by reduction. This latter must have been an independent, later development, not related to the Yupik prosodic shift but to its own acquired prototonic stress. Also morphologically it contains a few archaisms, but innovations are more typical here - notably its loss of the dual (as in West Greenlandic), its new morphological tense markers, and the reformulation and redistribution of its nominal/pronominal case markers. Lexically it shares a few archaic words with Inuit that have been replaced in Yupik, such as **umɬəX** 'day' (Inuit **uvluq**), **tanəR-** 'forbid' and **ali** '(place) afar', and many more with CSY and Inuit that have been replaced in Alaskan Yupik alone. It has also borrowed many words from Chukchi - more than CSY. Naukanski too has borrowed somewhat more than CSY, following the recent physical dispersal of its speakers among predominantly Chukchi settlements. In many cases it is impossible to disentangle whether such loans came via CSY - from which Sirenikski has also borrowed strongly - or directly from Chukchi: its dwindling number of speakers must have been trilingual in their own language and CSY and

probably Chukchi for at least a generation.

Of course the Chukchi themselves never made it across Bering Strait in any number (some Itelmen-speaking Kamchadals were however moved by the Russians to Unalaska on the American side in the eighteenth century). They have nevertheless nearly succeeded in ousting or assimilating the last Eskimos on the Asian side, and individual Chukchi have apparently crossed over, married Eskimo women and settled down. Family ties around the Gateway are complex and cross all linguistic boundaries - they probably always have done. Given another century without European intervention and the language might well have crossed over[45]. Several Chukchi words have travelled ahead of them, however, as mentioned in 6.3 - as a curiosum note that the Chukchi word for 'birch', **wəlɣil**, has apparently made it (alone of Chukchi loans) all the way to Greenland along with driftwood from the Siberian rivers (see Fortescue et al. 1994, 366 for **uliɣiiliq**, which refers in Greenlandic to a brittle kind of driftwood). For an account of Chukchi-Eskimo interaction in recent historical times, when the Chukchi generally took the more aggressive role, absorbing or displacing Eskimos along the coast but not penetrating the Eskimo stronghold of St. Lawrence Island, see de Reuse (1994, 295f.), who discusses, besides the loans coming from Chukchi into Siberian Eskimo, the possibility of an early Chukchi-Eskimo trade jargon that may have facilitated their transfer.

The overall picture that has emerged then, is of a single fairly homogenous language mesh (if not 'stock') expanding slowly out towards the west as far as Scandinavia and Hungary, east as far as Greenland, and north to the arctic coast at all points in between, leaving its original (upper Yeniseian-Sayan-Baykalian?) homeland. Although its descendent languages have today been entirely ousted from that region today, important innovations may have taken place there, including perhaps the development of palatal vowel harmony under Altaic influence. In the eastern and western peripheries of its expansion there is both conservatism and influence from substratum/contact relationships with Indo-European in Europe and with (pre-)Na-Dene and/or 'Mosan' languages in the southern refugium areas of Greater Beringia (particularly strong, it would appear, on Kamchatka but also discernible - if somewhat less dramatically - on the Aleutian islands)[46]. Eskimo, remaining largely in the less hospitable regions north of this, was less affected by any substratum population. Eskimo-Aleut innovated in its own ways (developing, for example, its ergative clause type), but may nevertheless have picked up a few important 'Gateway' traits such as uvulars on its way into America. The original phonemic inventory typifying the US language mesh gradually changed as the descendent languages moved east and west, but its hallmark - the coexistence of a single voiceless stop series and a single voiced fricative series - must have remained intact until recent times at both peripheries (in the east it still is).

What then is different about this conception of the expansion of the Uralo-Siberian 'mesh' and that provided by the 'wave of advance' theory briefly discussed at the outset of Chapter 1? Certainly I would go along with this theory to the extent that it views the basic mechanism of linguistic spread more as gradual population build-ups and wave-like expansion in all available directions than as a series of sudden, discrete migrations (though these may of course also occur). However, there are a number of important ways in which the picture I have sketched above does not square with Cavalli-Sforza's model. First, linguistic waves may generate out from a centre more than once, producing overlapping 'rings' of innovation rather than just a single

advancing wave-front. Secondly, and critically, since these linguistic waves move faster than the genes of the population bearing them (as peripheral people switch to the language of their expanding neighbours), the further from the centre the waves reach, the less precisely will gene pool and language come to match. In our present case this can be seen in the extremities of the regions where Uralo-Siberian languages are still spoken: if the original population speaking one or more of these languages in the Sayan region was of a Neo-Mongoloid type (as all the signs seem to indicate), then the genetic profile of Uralo-Siberian speakers has become more and more mixed with 'Europoid' genes in Europe as the stock gradually moved westwards, while on Chukotka and in the American Arctic it has become somewhat mixed with 'Paleo-Mongoloid' genes from residual ancestors of American Indians.

Finally, this expansion can not be linked to a single technological or cultural innovation that allowed a massive demographic build-up (in the manner of the introduction of agriculture in Renfrew's scheme of things for Europe[47]). The situation differed in different parts of Eurasia, and amongst nomadic hunter-fishermen of the Far North in particular, such factors as changing climate and resource availability must always have played a greater role than sheer demographic numbers in determining the timing and direction of expansion.

8.4. What came after: Altaic and Indo-European encroachments

What followed in Siberia and Alaska (I leave Europe aside) is a story of gradual encroachment upon the Uralo-Siberian languages by first Altaic and then (soon after) Indo-European languages from the more populous and economically advanced south. Already by two thousand years ago these powerful neighbours may have driven a wedge into the heart of the previously homogenous Uralo-Siberian territory (see Map 6). By 1000 AD nomadic Tungusic people had reached the Arctic with their reindeer herds, and Yakut pastoralists, under Mongol pressure from the south, were moving up the Lena valley towards the north - the Sayan had been dominated by Turkic people for many centuries already at this stage - and it would not be long before the Russians began pushing over the Urals towards the east in pursuit of empire. It was not until later that English - and French - colonialists (following the Norsemen) were to meet the Eskimos and Aleuts of North America, but everywhere the Europeans went, the result was the same: today there is no part of the Arctic - with the exception of Finland, Greenland and parts of the Canadian Arctic - where a Uralo-Siberian language is spoken by a majority of the region's inhabitants. Only the fiercely independent and geographically isolated Chukchi managed successfully to resist being forced to pay tribute to the Russian Empire (missionaries fared no better among them); the last nomadic groups were finally integrated into Soviet collectives in the 1950s. The general account of these events and the factors accelerating them have been described by others. I shall just tie up a few threads by bringing the fate of the Bering Strait Inuit and the Aleuts up to date, two peoples who have been buffeted more than most by recent political events beyond their control, straddling as they do (or did) the international border between Russia and America.

After perhaps 4,000 years of unbroken inhabitation of their mountainous, foggy island chain (and much longer if one includes their probably non-EA speaking Anangulan predecessors), the Aleuts were the object of ruthless exploitation by the

Russian promyšlenniki (merchant travellers), who began their activities in the region around 1740, far from the central control of European Russia. Later more organized control on the part of the Russian American Company dispersed them geographically in connection with the exploitation of local fur resources (especially the sea otter) as far afield as the Kurile Islands and the coast of British Columbia (in the 1820s groups were also moved to the Pribilof and Commander Islands). This treatment, aided (as is usual in the early phases of colonialization) by previously unknown 'white man's' diseases, led to their literal decimation (between the 1740s and the 1820s the population is estimated to have dwindled from 12 or 13 thousand to 2 or 3 thousand). The remains of earlier dialect differences (overlain by the spread of the eastern dialect from the Alaskan Peninsula) may have disappeared in the process. A somewhat later phase, during which a bilingual native 'elite' (of mixed descent but predominantly Russian speaking) came to mediate between their Russian masters and the monolingual Aleuts, produced an unusual kind of creolization that has received considerable commentary in the language contact literature, namely the mixed language of Copper Island, which combines Attuan Aleut verbal stems with Russian inflections[48]. The social background of the phenomenon - which may have involved the creolization of an Aleut pidgin spoken by the native 'elite' following upon the withdrawal of the Russians - is described in Golovko and Vakhtin (1990).

Despite these early setbacks, literacy amongst the Aleut developed rapidly under the aegis of the Russian Orthodox church, which continued for some time after the sale of Alaska to America. The outbreak of the Second World War meant further upheavals for Aleuts on both side of the (new) border, with the occupation of the westernmost end of the chain by Japan and the removal of the entire population from the rest of the chain to locations on the American mainland. The fate of the Attuans was particularly tragic: first forcibly moved to Japan, the survivors returned to Atka after the war (together with original Atkans), but their minority dialect is now extinct. The final ravages undergone by the Aleut language are of a different but more insidious nature: the pressure from English (and on Bering Island Russian) has all but replaced the language amongst younger Aleuts except for a handful on Atka itself, despite a new, Roman orthography and recent brave attempts to reintroduce Aleut as a subject in the schools. See Bergsland (1994) for further details.

The Bering Strait dialect of Inupiaq is the only other 'Uralo-Siberian' language spoken (not long ago) on both sides of the international border. Although there are still some 165 speakers left on Little Diomede Island on the American side of the border, the inhabitants of the larger of the twin islands, Big Diomede (or Imaqliq) on the Russian side, were all moved for reasons of 'national security' onto the adjacent mainland during the early days of the Cold War. Here they were assimilated by Naukanski Yupik speakers (themselves moved around several times from one Chukchi-dominated village to another), and were no longer able to communicate with their fellow islanders on the American side. Their language - the one variety of Inuit Eskimo spoken on the Russian side of the international border - is today extinct, and the situation of all varieties of Eskimo is still precarious, though tenacious for the time being in the face of pressure from both Russian and - to a lesser degree - Chukchi.

On the American side, speakers of other Inupiaq dialects have also moved around in recent times, for different (usually economically determined) reasons, for example some of the Qawiaraq Inupiat who, along with Malimiut from the Kobuk area, moved southeast to the head of Norton Sound in connection with the introduction of

industrialized reindeer herding, displacing or absorbing most of the Unaliq Yupik who remained in the area (Kaplan 1990, 143). Also the King Islanders were dislodged in the 50s and 60s from their diminutive island to Nome, to live side by side with speakers of other Seward Peninsula Inuit (and Yupik) dialects closer to public services after the school on the island was closed down as 'hazardous' (cf. MacLean 1990 for an account of the recent history of Alaskan Eskimos - written by one in fact). Everywhere in Alaska (but less so in the Yupik speaking villages - especially those of St. Lawrence Island) English has made rapid advances at the expense of native languages and dialects. For a survey of the varied results of contact between native and colonial languages throughout the Arctic region (including trade jargons such as that of Herschel Island in northeast Alaska) see Jahr & Broch (1996) and for coverage of linguistic contact between different native languages see Bakker & Grant (1996), also van der Voort (1996) specifically concerning Eskimo.

One bright spot in this linguistically gloomy picture is Greenland, where, for various reasons (including isolation from the Eurasian mainland, a relatively large and homogenous population, and a relatively enlightened approach to native language use in school and church on the part of the colonializing Danes) the future of West Greenlandic does not appear to be threatened in coming years. The officially declared goal of the Home Rule authorities, namely of a truly bilingual society, is doubtless crucial here: if any arctic language is to survive in the modern world it must surely be through the realization of a stable, positive bilingualism. Also on St. Lawrence Island, isolated from the American mainland, the linguistic situation looks hopeful, bolstered by the reopening of the international border with Russia. The reestablishment of family ties through visits in both directions between the island and the Chukotkan mainland has rekindled pride in their language and culture also among the Eskimos remaining on the Asian side. The situation for the other small Uralo-Siberian populations of Siberia is for the time being bleaker.

On Table 19 are shown some of the known instances of language shift in the region (apart from the general inroads of Russian and English). These are people who have not achieved (or in some instances not even been interested in achieving) stable bilingualism. There were doubtless many more we can only guess at.

TABLE 19

Population groups known to have shifted language

Some	changed to:
Yukagirs	Yakut or Even
Samoyeds	Dolgan or Evenki
Evens	Yukagir
Yukagirs	Koryak or Chukchi
Tungus	Yakut
Itelmen	Alutor (more to Russian)
Koryaks	Even
Nivkh	Evenki (or other Tungusic)
Sayan Samoyeds[49]	Turkic
Yeniseians (Kets, etc.)	Turkic
Siberian Eskimos	Chukchi

Kereks	Chukchi
Finno-Volgic speakers	Turkic (and/or Russian)
Alaskan Athabaskans	Kobuk Inupiaq
Unaliq Yupik Eskimos	Seward Peninsula Inupiaq
Alaskan Athabaskans	Alaskan Yupik
Yukon Athabaskans	Tlingit
Alutiiq Eskimos	Eyak
Eyak	Tlingit
British Columbian Athabaskans	Salishan
Coastal Salish	Wakashan
Oregon Penutians	Salishan

As mentioned earlier, Yakuts, Evenkis and Evens are believed to represent elements of an ancient 'Paleo-Siberian' population who absorbed or were absorbed by Altaic intruders (just as sizeable elements in the populations of Finland, Estonia and Hungary must have shifted from earlier European languages to Balto-Finnic and Ugric at some stage). Their languages have in turn picked up certain 'Beringian' traits such as uvulars - or are in the process of doing so. In fact, some of the anomalous traits of Tungusic when compared with other kinds of Altaic languages can be explained in this way, for instance the ubiquity of phonemic schwa (only found elsewhere in Mongolian, a recent development), portmanteau possessive suffixes (possessum number marked before possessor), and, above all, the unusual form of root retraction harmony, which could reflect admixture with a substratum population as Tungusic people moved north along a more southeasterly route than that followed by the speakers of Proto-Eskimo-Aleut but essentially the same as that taken by CK speakers. The usual trigger of such harmony systems - uvular/pharyngeal consonants - cannot be reconstructed for any branch of Altaic, note. However, these triggering conditions are present in Nivkh, where, as we have seen, traces of this kind of vowel harmony are also found, so Tungusic could have acquired this trait at least from contact with Nivkh. Given its presence in Salishan also (and the other signs of a Nivkh-Mosan link) this could, as already suggested, be interpreted as representing a very old North Pacific Rim trait, picked up in turn by Chukotko-Kamchatkan and then Tungusic (but lost in the central Beringian region by pre-Na-Dene times)[50]. Another remarkable feature common only to Tungusic and CK is the 3s subject marker **-n** (see 4.1.3).

In such cases of ethnic and linguistic mixing it is not always clear who can be said to have done the shifting. The same can be said of the absorption of some coastal Salish by Wakashans expanding back to the mainland from Vancouver Island and leaving Bella Coola isolated (the two 'Mosan' populations involved may ultimately be related, of course). The case of the Tungusic (probably Even) group that shifted to Yukagir - influencing the formation of the Tundra dialect strongly - is of particular interest, since it is on the face of it rather surprising that an economically dominant population should have given up its own language, but this may simply reflect the superior numbers of the Yukagirs whom they mixed with in the process (recall the case of the last immigrants from Canada to join the isolated Polar Eskimos, discussed in 1.4). There is, as I have discussed earlier, reason to believe that ethnic identity and language were not as clearly linked in the minds of traditional arctic people as in later,

contact times (even today in Siberia that link is rather tenuous).

Perhaps the most remarkable fact - and one offering at least symbolic hope for the future of the smaller Uralo-Siberian languages despite the massive pressures they face from national state languages - is the continuing presence of one of these languages, the Bering Strait dialect of Inupiaq, right in the middle of Greater Beringia, on Little Diomede Island, where its speakers constitute the absolute majority on their rocky little world, facing towards the empty twin island on the Russian side whence their ancestors must have come many thousands of years ago. From this viewpoint the arbitrariness of the International Date Line, running between the two islands, must seem particularly absurd - as national borders surely must for all the interrelated peoples of the Circumpolar North.

8.5. By way of a conclusion

The linguistic conclusion of this book can be summarized by saying that although it has not been proven conclusively that the Uralo-Siberian languages constitute a deep genetic stock (any more than 'Mosan', 'Altaic', or - in its broader sense - 'Na-Dene' languages do), the attempt has brought us considerably closer to establishing the reality of an ancient Uralo-Siberian mesh displaying a particular typological profile, out of which most of the existing circumpolar languages of the Arctic arose. Recall from 1.1 that my conception of a 'mesh' covers any degree of historical relatedness between a group of erstwhile geographically adjacent languages linked by relationships of lexical and/or phonological or structural 'family resemblance'. This ranges from Sprachbunds of unrelated languages, through interlocking chains of languages where the ends are unrelated but where there is considerable overlap and actual language mixing in the core region, to situations where all the ingredient languages are ultimately derived from a single ancestral proto-language but the time depth is simply too great to prove it, and finally to cases of traditional language meshes known exclusively to involve related languages (such as the Northern Athabaskan one).

So this leaves open the possibility that the Uralo-Siberian languages are all ultimately related in a genetic sense. The accumulation of the results of successive contact phenomena stretching over many millenia may well have introduced a radical indeterminacy as to 'ultimate' genetic relationships however, despite the theoretical possibility of determining a unique genetic source for any language when viewed from the perspective of no more than a single contact situation. The disappearance of numerous collateral branches (and whole families that there might once have been contact interference from) makes reconstruction still more difficult. What can be hoped for at the kind of time depth this book has been concerned with is a partial mapping of the successive contact/mixing episodes that have occurred en route from some common point of departure, affecting the individual enfolded strands in a way that can be seen plausibly to lead to the surviving languages of today.

It is in supporting this kind of endeavour that archaeology and anthropology have their place in historical and areal linguistics: they can suggest particular times and places where successive contact episodes are liable to have taken place - and between which population groups that are still around in the region. This I hope has been amply illustrated by the present investigation.

Notes to Chapter 8

1. This is not to rule out, however, the possibility of small groups passing through the isthmus in favourable times with their language more or less intact. One thinks of cases like Uto-Aztecan Pipil, which got as far south as western El Salvador, but this is still far from the isthmus proper. A better example is found in the case of another narrow bottleneck at the periphery of Greater Beringia, namely the strait dividing the Asian mainland and Sakhalin, which was crossed by the reindeer-herding, Tungusic-speaking Orok at a time when the area on both sides of the narrow strait was already occupied by coastal Nivkh. Their language remains very close to that of the mainland Nanai. The fact that the numbers of people involved must have been very small and their way of life nomadic would have played an important role. The infiltration of reindeer-herding Koryaks and Evens deep into the interior of Kamchatka may also be parallel.

2. One should not underestimate, however, specific social/ cultural factors, especially in Amazonia, where strict linguistic exogamy (men marrying wives from tribes speaking other specific languages) can be found, with rather stable village bilingualism resulting (cf. Jackson 1974). Such a form of exogamy could be a response to necessary proximity with otherwise hostile neighbours. Its net effect could well be to maintain linguistic fragmentation and counteract the tendency towards convergence that one typically finds in multilingual 'Sprachbund' areas like India.

   Note that Lorenz and Smith (1996) see evidence of restricted gene flow through Central America, with relatively independent developments in North and South America. The distribution of their four basic mtDNA haplotypes represented in the Americas is more even - i.e. mixed - in the southern than in the northern continent (op. cit.: Figure 5).

3. As regards the mtDNA picture, acceleration of genetic drift owing to such a bottleneck effect might account for the presence of lineage A (typifying Eskimo-Aleuts, Na-Dene and to a lesser degree 'Mosan' people) all the way down into South America, given a single entry scenario (if all native American populations reflect a common northeast Asian gene pool), but it does not explain why lineage B, widespread among southwest American Hokans, should be largely absent from populations further north (the presence of the trait among Californian Penutians could reflect a Hokan substratum). Forster et al. (1996), supporting a single founding Amerindian population model with a variety of mtDNA haplogroups already on the Asian side, but with Eskimo-Aleuts and Na-Dene representing a later expansion, conclude that the presence of all the main American haplogroups in South America reflects an initial rapid movement south before 20000 BP, followed by a Holocene expansion out of Beringia into northwest America about 13000 BP (during the same post-glacial warming period that stimulated the Clovis culture). The latter would have been characterized by the lineage A variant predominant also in coastal Siberia at this later stage - they note that far northern populations tend in general to have much less mtDNA variation than more

southerly ones, reflecting in this case the depopulation caused by the last Pleistocene stadial (Forster et al. 1996, 941).

4. Although historical reconstruction suggests a relatively slow rate of change within northern (i.e. Eskimo) Eskimo-Aleut, the last linguistic wave from Asia, once it did get across Bering Strait some four and a half thousand years ago.

5. If this earliest entry were associated with a 'Paleo-Indian' founder population (ancestral to both Hokan and Penutian speaking people at the least) then somehow one would have to fit in one or more 'Mosan' wave (with independent typological links to Asia) before the Na-Dene one, which itself could not have been later than the Paleo-Arctic horizon (Ushki 6 plus 5) according to Dikov's scheme of things. In that case his association of Ushki level 6 with ancestral Eskimo-Aleut would be even further misplaced than I have suggested it is - recall rather the tentative association of Mosan people with Ushki level 6 mentioned in 7.2. Note that (some) Penutian languages do share certain important features with both Mosan languages and Nivkh, such as inclusive vs. exclusive 1st person plural marking, some kind of (at least vestigial) vowel harmony and tonal contrasts, and some form of stem reduplication. Also (some) Hokan shares a number of the traits discussed in Chapter 3 with Nivkh and/or Mosan (complex clusters, noun incorporation, inclusive/ exclusive 1st person, etc.). So Greenberg may yet be right in assigning a common source to all of these American stocks. One could of course just as well imagine Hokan and Penutian (as well as Mosan) splitting up already on the Asian side, even if they both stem from a hypothetical 'Proto-Indian'.

6. Other, more typical spread zones in Siberia and North America are the major river valleys of the Lena, the Amur, the Yenisei and the Kolyma (in all of which diversity may have built up more than once before more persistent waves of newcomers absorbed remnant groups), and the arctic coast and the great plains of North America. For an interesting synthesis of archaeology and linguistics in tracing the spread of Algonquian languages across the latter zone see Denny (1991), who incidentally discusses the role language shift must have played in the process. Although Nichols (1992, 17) characterizes the whole of Mesoamerica as a spread zone, its very linguistic diversity (not to mention its mountainous terrain) suggests otherwise - it is a large linguistic area, the result both of complex political/economic dominance disjunctions and, I would claim, of the funnelling properties of the isthmus bottleneck.

7. The intervening spread of the Yukagirs from the same general region can be regarded as an ultimately abortive wave without the economic dynamism necessary to replace or absorb the Chukotkan spread before it.

8. The considerable convergence and borrowing in evidence on the Central Asian steppe - a classical spread zone (at least in its western section) - would appear to constitute an egregious exception. However, this region is unusual in a number of respects, notably as regards the complex movements of both peoples and political power centres back and forth across it in <u>all</u> directions, but also as regards the

typological closeness of all - or most - of the languages that have traversed it one way or the other since early Indo-European times, which may conceal a very ancient genetic unity. This would render structural as well as lexical borrowing much easier then if typologically very different languages were involved. Also the nomadic, pastoral economy on which the area is - or was - traditionally based is very different from that of neolithic Europe, where successive waves of newcomers, whatever their origins, eventually became sedentary agriculturists, not to be budged (as opposed to linguistically absorbed) by further incoming waves. The movement was nevertheless predominantly westward from central (or eastern) Mongolia with the power centre moving gradually in the other direction, finally reaching the less open Tungusic heartland in Manchuria, north of the nomadic zone, from which expansions both south into China and north into the eastern Siberian taiga were initiated in relatively recent historical times (see Janhunen 1996). The net result would seem to have been a general shift westward of the geographical centre of gravity of all three Altaic families, producing at least one Turkic lexical layer in Mongolian (dating from Hunnish times, when Mongolian might have begun to make inroads into central Mongolia from further east). Later. following the establishment of the Mongol Empire by Chingis Khan in the 12th century, the loans went predominantly the other way. Mongolian also shares many loans with Tungusic, whereas the latter generally received Turkic loans only via Mongolian.

9. Although residual groups of Paleo-Eskimos, spread over the vast arctic wilderness, could have been absorbed by Thule newcomers and shifted to their language without any interference affects (cf. Thomason & Kaufman 1988, 119ff). There are also more recent, documented cases of the absorption of one Inuit group by another, usually resulting in a clean shift on the part of the minority group with little interference effects on the target dialect, for example in the case of the miniature migration from Baffin Land to northwest Greenland during the second half of the last century mentioned in 1.5. Although the Polar Eskimo majority relearnt from the newcomers a number of important cultural items that they had lost, their language was more or less unaffected by that of the newcomers. In this case there would have been mutual comprehension anyway.

10. Three egregious examples of this may be New Guinea (populated initially from Australia when still joined to it by a land bridge), Japan, where both linguistics and archaeology point towards some kind of mixing of populations, and the British Isles, where insular Celtic shows strong substratum effects from some preceding non-Indo-European population, and English too may be definable as in some sense a 'mixed' language (although Thomason & Kaufman 1984, 263ff argue that it is not strictly such). There is at all events evidence of successive linguistic layering in all these cases, some of the layers having minimal effect on following ones, others having very strong effects on what followed indeed.

    It is not by chance that the areas with the greatest linguistic variety on earth are typical 'residual' (or refugium) zones, many of them either bottlenecks, as defined above, or mountainous impasses such as the Caucasus or highland New Guinea. Closer to the region of the present study, the Sayan mountains (where Turkic, Yeniseian and Samoyedic languages were in close proximity in the past)

constitutes another such zone, as does Sakhalin-Hokkaido and adjacent mainland (where Ainu, moving up from Honshu under Japanese pressure, and Nivkh and Tungusic from the Amur region - and probably other extinct languages - have interacted, hence the suspected typological influence of Japanese on Ainu in recent times, for example). Such areas tend to present 'Sprachbund' profiles within which much mutual borrowing has taken place (as for example in the Balkans).

11. There are also constraints on such clusters in Mosan (especially Wakashan) languages. Note that some of the clusters which appear to have produced ejectives in Itelmen, such as /tr/, do exist in Nivkh (which does not have ejectives).

12. It is tempting to see some concrete morphological evidence of a Na-Dene-related substratum in certain suffixes of Itelmen that constitute notable divergences from Chukotkan. Thus the very common future and present tense markers, **-a ɬ-** and **-s-** respectively appear to go well with the Proto-Na-Dene progressive/future suffix reconstructed as **-ɬ-** and the Tlingit imperfective suffix **-s'-**, which also has traces in Athabaskan (cf. Leer 1979, 51). These occupy a different position in the verb than such markers in Chukotkan, where they correspond to inflectional paradigms rather (they are derivational suffixes in Itelmen, appearing after the stem as in Na-Dene, and must be followed by person/number inflections). However, the morphemes concerned are too short to be diagnostic (as regards their form at least).

13. An inherited US /s'/ ~ /c/ variation may have resulted in the /l/ ~ /c/ alternation under ND substratum influence (also the inherited palatalized vs. plain alveolar - including lateral - distinction became limited to affective usage in CK at some stage). Leer provides examples of Tlingit doublets where plain /ɬ/ varies with pejorative /š/ or /č/. Note for example **ʔaX dl'i·G** 'my finger' as opposed to **ʔaX wan-ka-č'i·G** 'my little finger' (**wan-ka-** = 'edge-surface'). There is consonant symbolism elsewhere in the Northwest coast area (most notably in Chinook and other OP, but also in Wakashan, Salishan, Hokan, Algic, CP and CA), although not usually with precisely these consonants (in Salishan, for example, it is typically a matter of variation between glottalized and non-glottalized consonants, often combined with reduplication). However, there is evidence of just such an alternation (/l/ ~ /s/ or /c/, etc.) in Nivkh (cf. Panfilov 1968, 127 and Tailleur 1960, 127) and in Wakashan (cf. Sapir 1915, 5 & 10 for Nootka and Kwakiutl respectively), so this trait of what Sapir calls 'consonant play' could belong to an earlier North Pacific Rim layer. Compare also the suffixes of 'emotional attitude' (e.g. of sympathy or disdain) mentioned in connection with Map 21, widely distributed around the same Rim area.

14. This does, however, have a geographically closer parallel in Tsimshian, which also has an enclitic definiteness marker (compare the preposed definite 'article' in nearby Salishan), although contact between these two languages is superficial and recent according to Enrico (1984, 226). The marking of various kinds of definiteness of NPs - through deictic particles in Sa, clitics in Ts, and elaborate systems of deictic suffixes in Wakashan - is a Northwest areal trait.

15. Both Nivkh and Itelmen could in theory display a similar pre-Na-Dene substratum: like Na-Dene, western Nivkh has three series of stops (voiced, aspirated and non-aspirated rather than voiced, voiceless and ejective, however), and displays SOV order despite prefixing possessive morphemes, like Haida too. Too much should not be made of this latter trait, since in SOV languages independent possessor nominals usually stand before possessed heads (as in CK languages too). Yukagir represents an intermediate stage on the way towards prefixed possession marking as regards 1st and 2nd person pronouns, which are incorporated before their head nouns - its 3rd person possessor suffix has a different origin (see 5.1.2).

16. The possibility of a Nivkh substratum beneath the Altaic overlay of Korean should also not be ignored - in fact this is what Krejnovic (1955) implies (he also lists later Tungusic loans in Nivkh). Note in particular the n-initial 1s pronominal marker of Korean, also its aspirated versus non-aspirated stop series (like Nivkh but also Chinese) - its 'constricted' series of stops are phonetically very close to ejectives and could have a parallel origin to that of Itelmen ejectives (from syncope, assimilation and voicing onset adjustment). Nivkh also appears to have pitch accent distinctions of the Japanese/ Korean type (Peyros & Starostin 1986).

17. Classificatory verbs, found in Wakashan, Tsimshian and some Salishan, are on the other hand typical of all ND and Haida and may reflect very early (pre-)ND-Mosan contact, though it is not clear which family was the source of this areal feature.

18. Including subject prefixes combining with object suffixes as in Algonquian and some Salishan. Recall too that Salishan has some circumfixes - like CK - and is believed to have displayed greater prefixing in the past. Note also the possible source of the various CK 'singulative' markers in noun class distinctions (as in Mosan and Nivkh noun classes and/or numeral classifiers), mentioned in 4.1.1.

19. These may take on paradigmatic meaning (being obligatory with certain adjacent prefixes but not others); they also have something in common with the Na-Dene so-called 'classifiers', sometimes occurring obligatorily, like them, in conjunction with an immediately following stem, although largely devoid of independent synchronic meaning.

20. Compare the verb-forms in Koyukon sentences (e) under 1.3 with the following Ket form: **s'ug-ba-tn** 'I return', where **-ba-** indicates the 1st person subject and **s'ug-tn** is the discontinuous 'stem'. In this way inflectional and derivational elements come to be interdigitated in complex ways vis-à-vis the stem, as in ND (compare the usual situation where derivational elements tend to stand nearer to the stem than inflectional ones, as in US languages). Also the typical 'classificatory' verb stems of ND have a parallel in the highly leached stems in Ket indicating a singular or multiple action which must be combined with discontinuous 'thematic' or 'co-verb' prefixes to produce concrete meanings (but compare the discussion in 3.3. of this feature). See the articles in Ivanov et. al (1968) for examples of these and other Ket constructions mentioned.

As regards the actual form of such morphological elements, note the intriguing coincidence between perfective/ past markers **-l(V)-** and **-n(V)-** in both Ket and Athabaskan (also between Ket present/future **-s'-** and the Tlingit imperfective morpheme of that shape mentioned in note 12).

21. On the other hand, no convincing lexical evidence for a common source for Na-Dene and any other language family in the Old World has yet been produced, although there are typological reasons to look in the direction not only of Yeniseian languages but also of Sino-Tibetan, as first suggested by Sapir (and see Shafer 1952, who equates for example the 2s affix **-ni-** and Chinese **ni** 'you', but also Krauss 1976, 343f. for a critical summary). Note for instance the almost exact fourfold parallel between the paradigmatic categories of symbolic verb stem alternation in Athabaskan and Tibetan, namely for perfective/ past, imperfective/ present, future and optative (imperative), an unusual and very specific blend of aspect, tense and mood. Both Tibeto-Burman and Na-Dene languages are predominantly prefixing yet display predominantly SOV word order (and the same can be said of Ket), a typologically uncommon combination.

22. Tlingit may, more specifically, have picked up the morphological manifestation of its stative-active orientation (like Haida) from ergative Tsimshian, its immediate neighbour to the south - since it is of head-marking type, the distinction would not originally have shown up on NP arguments. Tlingit (like all Na-Dene) would at all events have had a distinct stative verb category already. In fact, like Haida, it has stative/active orientation, which may have been the original situation in the family (cf. also Ket), and it could have borrowed the 'subjective' (actually ergative) proclitic pronoun usage of Tsimshian (prefixed in Tlingit) in conjunction initially with transitive active verbs and then extended it to all active verbs. This would have been facilitated by the subjective but not the objective pronouns of Tsimshian being proclitic rather than enclitic (Tsimshian, note, is a VSO language, unlike SOV Tlingit) and by the subjective proclitics being used in a cleft-like construction for emphasizing the subject of both transitive and intransitive verbs (Boas 1911, 385) - this construction may thus represent the specific model for transferral to Tlingit. This is rendered more likely by the fact that Tlingit independent pronouns are organized on an ergative basis, surely a direct result of contact with Tsimshian.

    Tsimshian, note, is a (highly divergent) 'Penutian' language typified by enclitics rather than complex affixation; it may have moved up from inland Washington/Oregon at some early stage (perhaps in connection with the Numic Uto-Aztecan expansion into the northern Great Basin) and have acquired a somewhat greater degree of synthesis - including incorporation, stem reduplication, numeral classifiers and prefixed tense-aspect markers - from its new neighbours there (see Sherzer 1976, 81f.). Whether it was already in its present coastal location when Tlingit arrived is unknown but likely.

23. Although, as discussed earlier, it is still too early to be certain how the mtDNA data is to be interpreted in terms of number or timing of distinct entries into the New World. The type of relationship between genes and language which should at all events be envisaged for these early stages, given a multiple entry model and

the association of specific mtDNA profiles with each (by no means a certain matter!), would see each successive wave of entry forming complex areal haplogroups through admixture with populations already laid down, in much the same way as with the languages introduced but at a much slower rate. The main thing to bear in mind is the 'disjunction' of language and genes. Thus, for example, the source of the ethnic Eskimo-Aleuts might be said to lie with a Siberian population characterized by predominant mtDNA lineage A (not necessarily directly reflected in modern Siberians), mixed with a pre-ND population (also predominantly lineage A) that preceded them in the region; in turn they contributed genetically to the following CK population. The presence of other lineages than A in the native population of Alaska could be attributed either to traces of still earlier populations in the region, long since moved on, or to variety in a single founding population.

24. Also in Tlingit. In Aleut this is a matter of the number of any anaphoric referent overriding that of the 'internal' subject, which extends even to subject/object possessor referents. Compare the following sentences from Leer (1991), respectively Aleut and (Alaskan) Haida:
Piitra-m aða -ŋis kiðu-ku -ŋis
Peter -REL father-3PL help-PRES-3PL
'Peter is helping their father'
hal ʔaw ɬ qiŋ-ʔu-gan
3AN mother I see-PL-PAST
'I saw their mother'

Also the Chukotkan distributive affix **-ca-/-la-** has the analogous effect of marking plural object number on transitive verbs (and plural subject on intransitive verbs), although any overt NP object phrase will bear its own number marker too. Possessum object incorporation (accompanied by stranding of the possessor) in Chukchi and Koryak may also be indirectly related to the construction illustrated here. Some coastal Salishan, Tsimshian and some OP have similarly functioning morphemes, so this may be another early North Pacific Rim feature.

25. Thus in Koyukon, with optional positioning of the head noun itself after the subject of the relative clause:
keel sookanee ya-ghee-hon nizoonh
boy bread 3s.OBJ-3s.PERF-eat be.good.3s
'the bread the boy ate is good'

Compare Atkan Aleut:
asxinuX tayaRu-m saX kalu-l angali-i
girl.ABS man-REL bird.ABS shoot-CONJ do.earlier.today-3s.3s
uku-uRan aXta-kuX
find-INT do.a.while.ago-3s.PRES
'the girl found the duck that the man shot (earlier that day)'

This latter sentence can also mean 'the girl found the man who shot the duck'. For parallel examples in Koyukon (where, however, the presence or absence of 3s object marker **i-** on the verb usually disambiguates) see Thompson et al. (1983, 242). A similar phenomenon is also found in Haida (Enrico 1989, 237f), where a

completely unchanged finite clause may function as a relative clause containing its own head, as for example in:

dii-can buud dan tlaawhla-gan xyaang-gang
me-for boat you make-PAST leak-PRES
'the boat you built for me is leaking'

Further, with a possessive constituent dislocated from its alienable head:

gasan-cuu dang-gyaa ʔadaahl xi.u Bill salda-gan ʔaalaa-gaa
how-FOC you-POSS yesterday saw Bill borrow-PAST be.priced-NONWIT
'how much did your saw that Bill borrowed yesterday cost?'

26. It must also have predated the related change of intervocalic */p/ to voiceless /hm/ in Aleut, parallel with the other notable development of medial */v/ to /m/, which appears to have occurred after the reduction of original EA geminates, a trait also shared with Yupik (cf. Bergsland 1997, 6).

    The denasalization of initial nasals also typifies eastern Itelmen (with orthographic 'd' and 'b' corresponding to western initial /n/ and /m/). This language was spoken in the area - now Russian speaking - which at all times must have had the greatest population density (the Ushki site is located there) and was therefore quite conceivably the area also subject to the most pronounced substratum effects; the west was - and is - much more peripheral economically. This could reflect an ancient North Pacific Rim trait - the same typologically rare change has occurred in some coastal Salishan and Wakashan at least (Thompson & Kinkade 1990, 46).

27. In fact the change of initial */n/ to /d/ has also occurred within ND, namely in Han, Beaver and Sekani among other languages (in Hare it usually went to /r/ and in Tanacross and Kutchin it went to /nd/ or the like).

28. It is not far from the Haida structure to the more integrated polysynthetic verb forms of Na-Dene proper either: most of the elements in Haida are in the right order compared to the prefixes of ND (see Hymes 1956, 631 - details of whose comparative 'positional analysis' have been criticized, however). Note further that successive elements in the verb complex of Haida may correspond both to discontinuous morpheme chains in ND and to discontinuous verb stems in Ket (where, for example, a full verb may be incorporated earlier in the complex than some semantically leached auxiliary stem, although in ND proper full verb stems can only appear in one position, late in the verb-form).

29. Extended to EA **-cin**, Atkan **-cix** by the addition of ordinary number markers in the modern language. Bergsland further suggests that apocope of EA 3p marker ***-(ŋ)i**, later extended to **-ŋin**, Atkan **-ŋis**, may have been the immediate cause of the collapse of the three EA 3rd person possessor-possessum endings to one in Aleut (the same for any number possessum). The ensuing ambiguity of number marking on possessed nominals and transitively inflected verbs, he further proposes, could have led to the extension of the number of the anaphoric referent to the possessed nominal or the verb inflection (and in complex sentences specifically that of the most superordinate verb, rigidly positioned in Aleut sentence-finally).

Note that */ə/ as in EA instrumental/ ablative *-**mən**/ -**mək** most often fell together with /i/ in Aleut (when not going to /a/ or syncopated).

30. Also, further south, in Nivkh. Adjacent Nanai (alone of southern Tungus) also has a uvular pronunciation of the back allophone of /k/, from contact with Nivkh. That the area of 'root retraction' type harmony and that of uvular stops partially overlap may not be a coincidence (lowered/retracted allophones of vowels spreading from the context of uvulars is a known trigger for the former).

31. In fact Sherzer mentions that in Takelma (an Oregon Penutian language) the sound is only used to imitate the way of speaking of the Bear in myths, ridiculing the pronunciation of local Athabaskans (Sherzer 1976, 66).

32. In Sirenikski Eskimo this has gone so far that the majority of non-first-syllable full vowels have gone to schwa (probably under earlier proto-tonic stress and general influence from Chukchi).

33. With verbal cross-referencing of the Eskimo type and also nouns incorporated in verb heads and adjectives in noun heads.

34. The very precise distribution of this apparently non-functional trait suggests the mixing of pre-Na-Dene and Mosan and/or Algonquian populations probably somewhere in British Columbia in connection with the appearance of the Northern Archaic people in the north. The coastal Tlingits are also specifically excluded from the spread of this mutation. The only Eskimos who display it to any degree are those of Ungava Bay, adjacent to the Algonquian Naskapi, in whom the mutation was first ascertained. Recall that Algonquian probably had its origins in the west (adjacent to Kutenai and Salishan), to judge from the related Ritwan languages Yurok and Wiyot, each very different one from the other, that are spoken in California still today. It is possible that the 'Algic' languages (Algonquian plus Ritwan) represent the mingling of 'Mosan' people from the north with earlier Columbian Plateau people; in turn the Algonquians may have absorbed Siouxan groups during their expansion eastwards (as suggested by the distribution of the Albumin Naskapi mutation - cf. Lorenz & Smith 1996).

35. Note that the relatively shallow time depth within Yukagir - i.e. its relative homogeneity - suggests that it has not been in its present arctic position for very long, compared with, for example Athabaskan, which has - at similar latitudes - a much greater dialect/language spread. The lack of mtDNA lineage A amongst the Yukagirs also distances it from the Eskimo and Chukchi populations earlier in place. CK and (especially) EA also have a much greater time depth as families, although Chukchi has little dialect differentiation, and Inuit Eskimo can (with a little good will) be regarded as a dialect continuum of a single language, facts which are in harmony with what is known of the relatively recent spread of these languages through their present territory.

36. What constitutes a 'weak' position varies from family to family, however - in Balto-Finnic this is determined by syllable-structure (closed syllables inducing the weakening, as if to maintain syllable weight), as in Finnish **uuvu-n** 'I grow tired'

versus **uupu-i** 'he grew tired', whereas in Eskimo it is intervocalic position of the first segment of - especially - stop-initial suffixes that has been the locus of such processes, as in West Greenlandic **aŋi-va-ɬ-ɬaaR-puq** 'it is too big' versus **mikip-pa-ɬ-ɬaaR-puq** 'it is too small'. The situation in Seward Peninsula Inupiaq is rather special, with something closer to Finno-Baltic gradation having arisen relatively recently. Also geminate stops (reconstructible for most US families and perhaps the proto-language itself) may be drawn into such regular alternations, as has happened in Balto-Finnic, where they may alternate with single stops.

37. That the Mongolian and Turkic languages may have had palatal vowel harmony longer than Uralo-Yukagir and even passed this trait on to the latter is suggested both by its greater elaboration there (drawing an overlay of labial harmony into the picture) and by the more purely agglutinative nature of these languages than Uralic. Vowel harmony functions so as to 'glue' words together as semantically coherent wholes in a manner largely taken care of by more complex morphophonemic processes (other than vowel harmony) in Uralo-Siberian languages.

38. Other innovations include the merger of */s/ and */t/ (as the latter); the merger in large part of /ð/, /ð'/, /l/ and /j/ (as the latter); the change of */ɣ/ to /ə/, producing diphthongs; the development of voiced stops between vowels (also /b/ from */w/ initially), and - in Northern Samoyedic - of an epenthetic /ŋ/ before word-initial vowels (/n'/ or /j/ before front vowels); the further merger of /c/ with /t/ (except in Selkup) and of /k/ with /s'/ before front vowels (also of initial */j/ with /t'/ in Selkup); the distinction between more than one type of final glottal stop in some northern Samoyedic; the development of secondary vowel length in Nenets and Selkup; and the extension of the palatal series (most developed in Nenets, where nearly every consonant has a palatalized counterpart). Notable amongst morphosyntactic developments are the development of a 'zero copula' (conversion) construction, and (as also - probably independently - in Ugric and Mordvin) the development of transitive 'objective' paradigms of verbs.

Balto-Finnic also developed long vowels, expanded its case system considerably (like Hungarian and Selkup), and extended its system of consonant gradation. Finnish lost its palatal consonant series and Estonian its vowel harmony and possessive suffixes. Lapp (morpho)phonology in particular has become greatly complicated, and its morphology is more inflectional than agglutinative today (for an overview see Korhonen 1988).

39. Apart from general nominalized derivations of verbal stems. In Nivkh the bare verb stem (reduplicated in the plural) is used in modifying nominals in participial function. Wakashan languages do at least have a passive/past participial suffix distinct from a host of other more specific derivational suffixes (but neither W or Sa formally distinguish adjectives or nouns from verbs at all).

40. Of course a third possibility, that CK is not genetically related to any of the other languages discussed above, can not be ignored, but given the nature of the (pre)history of the region plus the morphological and lexical material that has been presented in this book, this seems unlikely. The question is surely at what

time depth there is a genetic connection to other Asian or North American languages (and of what kind it is), not whether there is one at all: the answer may of course lie either within or beyond the reach of historical reconstruction.

41. This probably spread, as mentioned in 3.2, from Pacific Coast Alutiiq - where it is most complex - to Siberian Yupik, where it is simplest; it could represent a contact phenomenon initiated when Yupik moved south into the area some thousand years ago.

42. De Reuse (1994, 306) mentions that quadrilingualism was not unusual among Naukanski and Sirenikski Eskimos at the beginning of this century, when English (via whalers) was still a major factor on the Asian shores of the strait.

43. However, all else may not be equal, and there is evidence of considerable bi- or multilingualism in certain inland areas such as the upper Kolyma valley on Chukotka and the upper Kuskokwim in southwest Alaska, where multilingualism between Central Alaskan Yupik, Ingalik and Tanaina Athabaskan has been around for some time (Kari 1989, 550). It is Yupik Eskimo which has been expanding inland in the latter situation, but this may have something to do with the difficulty outsiders everywhere have had in acquiring Athabaskan languages owing to their complex and irregular verbal morphology (cf. Bakker & Grant 1996, 1133).

44. Despite Thomason & Kaufman's (1988, 119f) claim that gradual shift will usually not leave much trace, owing to more or less perfect transmission from generation to generation via stable bilingualism. The present exception to this generalization (if it is one) may be due to the fact that we are dealing here not with a homogenous bilingual Eskimo community that is gradually shifting en masse to Chukchi, but rather with piecemeal shifts on the part of segments of the coastal population, leaving islands of Eskimo-dominated settlements remaining between Chukchi-dominated ones (only a few settlements, such as Uelen on the arctic coast, are really mixed, due to recent, forced redistributions).

45. Again, if it is correct that coastally adapted Chukchi participated in the 'Neo-Eskimo' Old Bering Sea Culture two thousand years ago, some may already have done so and been absorbed within Alaska.

46. Whether innovative Lapp at the northwestern periphery also reflects some kind of substratum is a controversial question, one that can hardly be isolated from the question of a broader ancient coastal population that may have affected all the northernmost Uralic languages. It is tempting to see the complex stem ablaut of these languages (at its strongest in Lapp) as due to some such common substratum influence.

47. The gradual spread of Uralic languages into agricultural Europe followed by a concomitant massive population expansion may be more parallel to the Indo-European story than Renfrew would care to admit: presumably no one would want to claim that Uralic spread along with the introduction of agriculture into Europe...

48. Its last speakers were moved to nearby Bering Island in the 70s. On the other of the two Commander Islands on the Russian side of the international border, a more normal variety of Atkan Aleut was (and still is, barely) spoken by the Atkan speakers who were moved there before this century.

49. Note that the last speaker of any of these languages - Kamassian, as it happens - died in the 1980s (K. Bergsland, pers. comm.).

50. The development in Proto-Na-Dene of 'constricted/ glottalized' versus 'plain' vowels at an earlier stage could perhaps also be related. The acquisition of root-retraction type harmony by Chilcotin Athabaskan is, on the other hand, probably a late development owing to contact with neighbouring interior Salishan.

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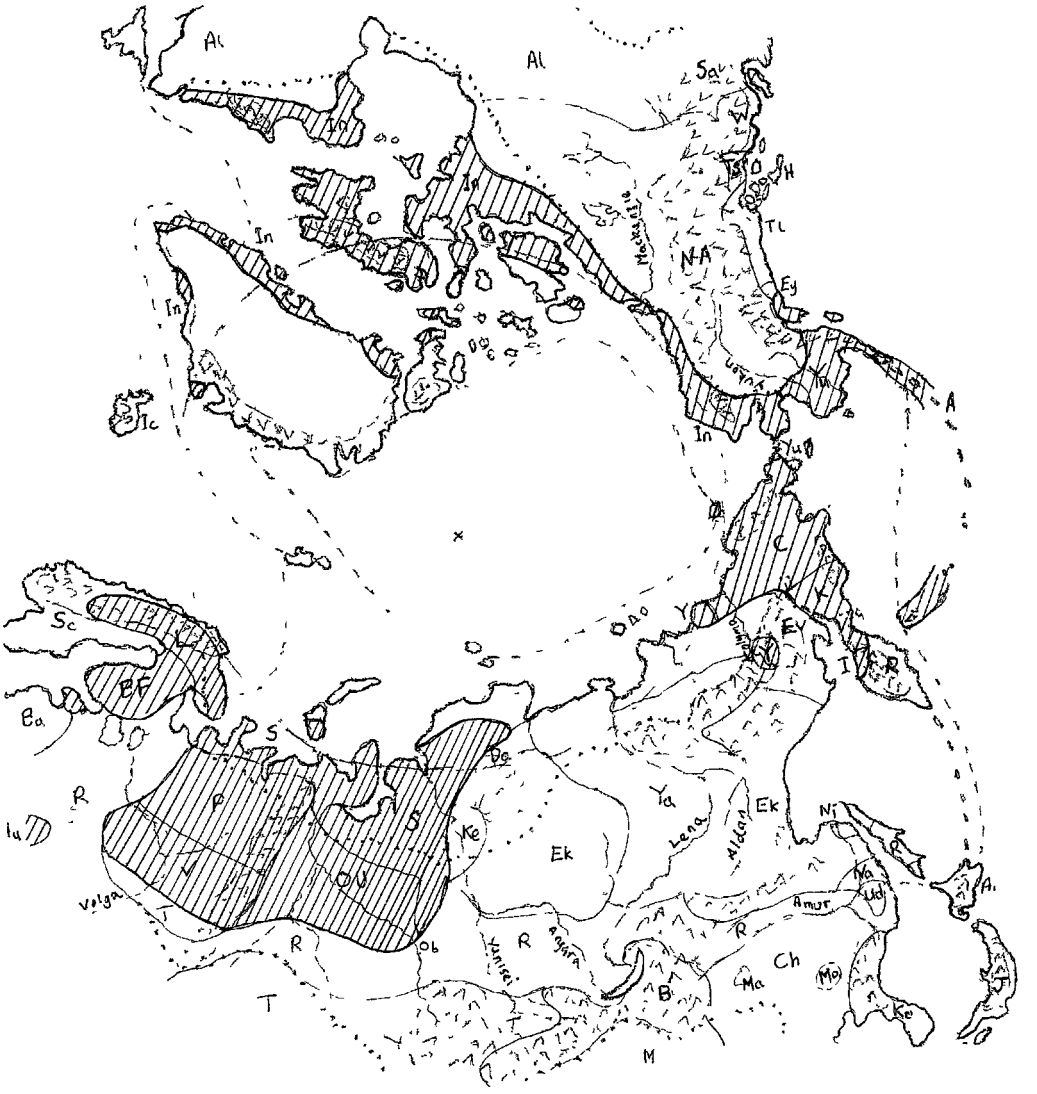
Map 1

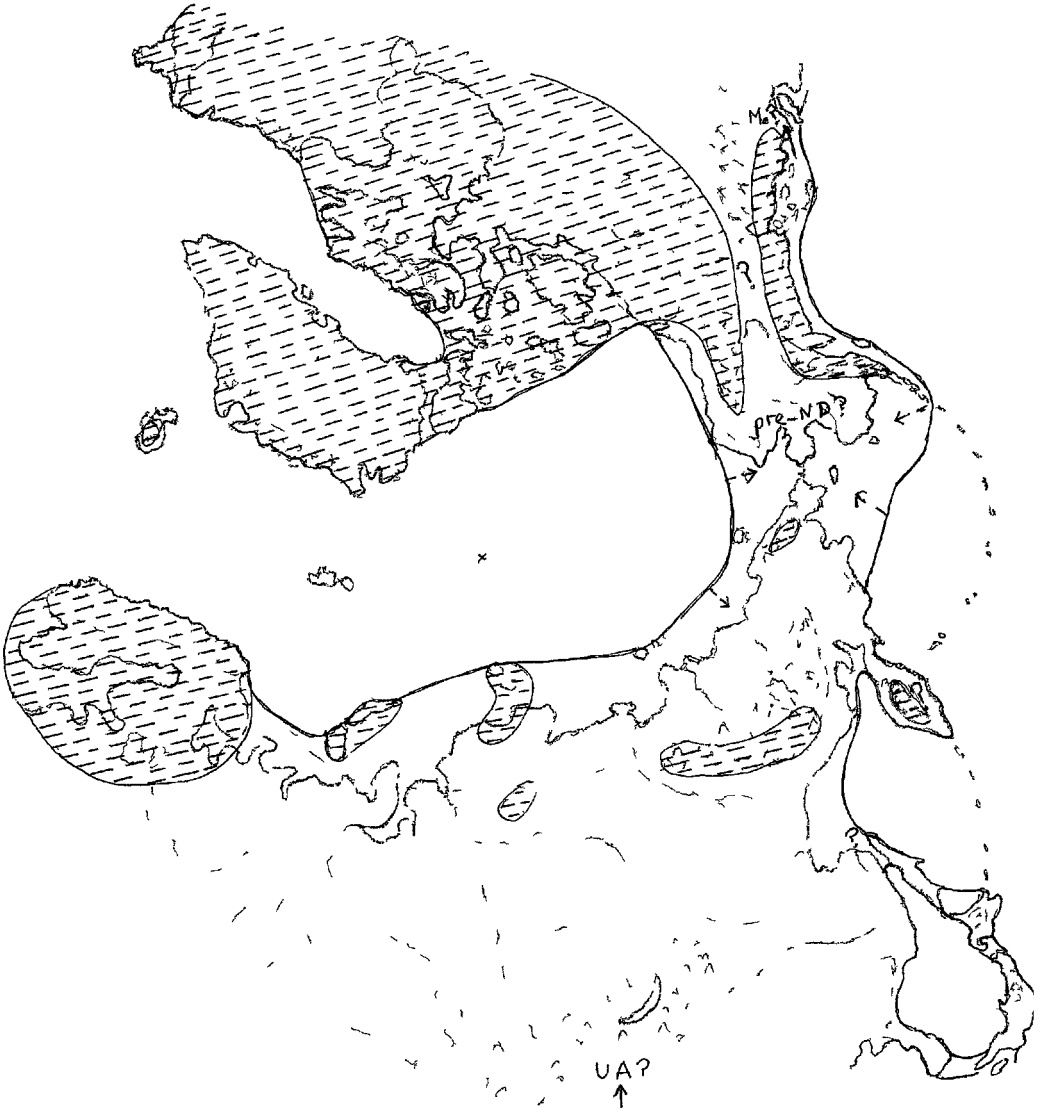


PRESENT DISTRIBUTION OF HYPOTHETICAL URALO-SIBERIAN LANGUAGES

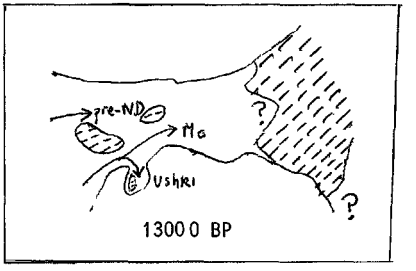
forested zone

mountainous regions

minimum/maximum pack ice extent



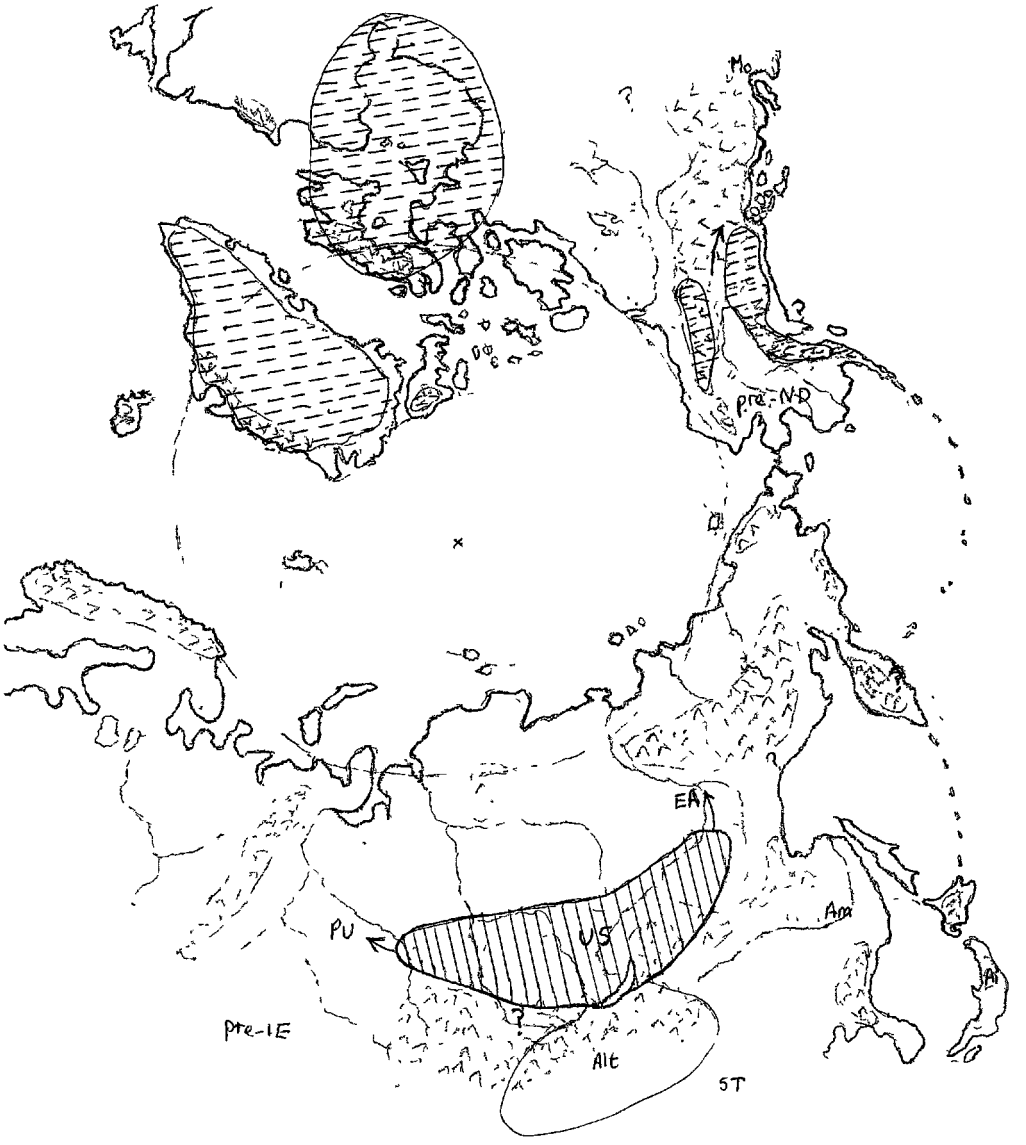
Map 2 11000 BP



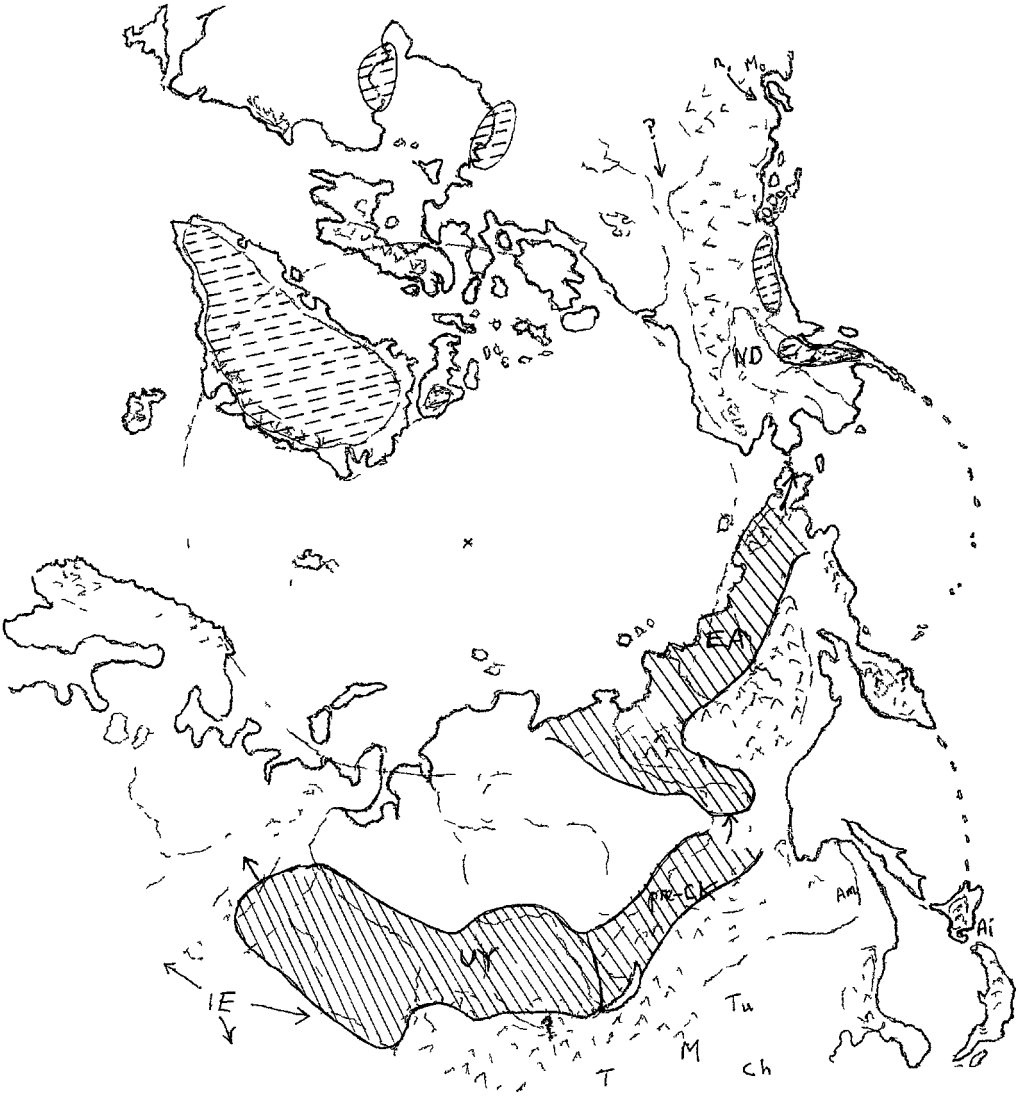
13000 BP

ice cover

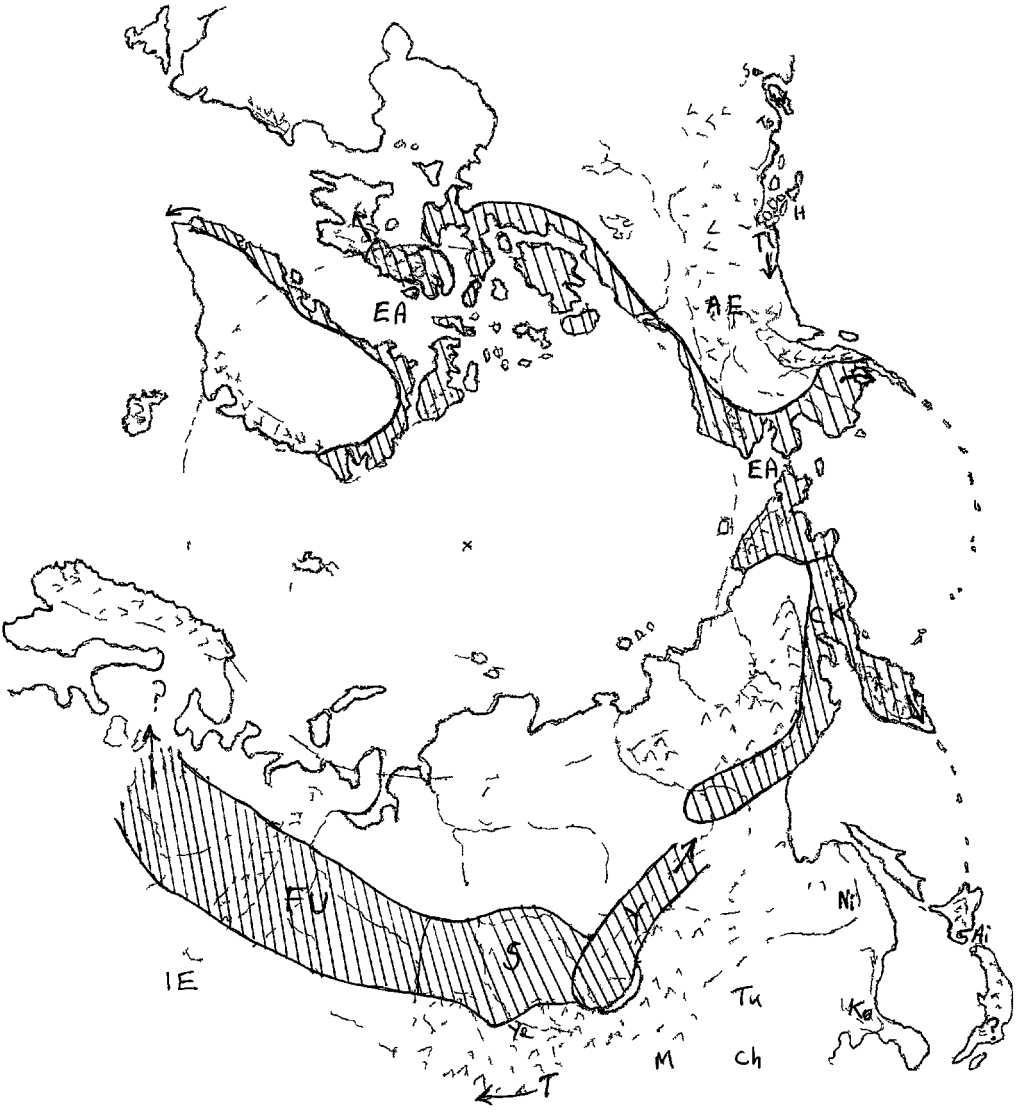
shore line and encroaching sea



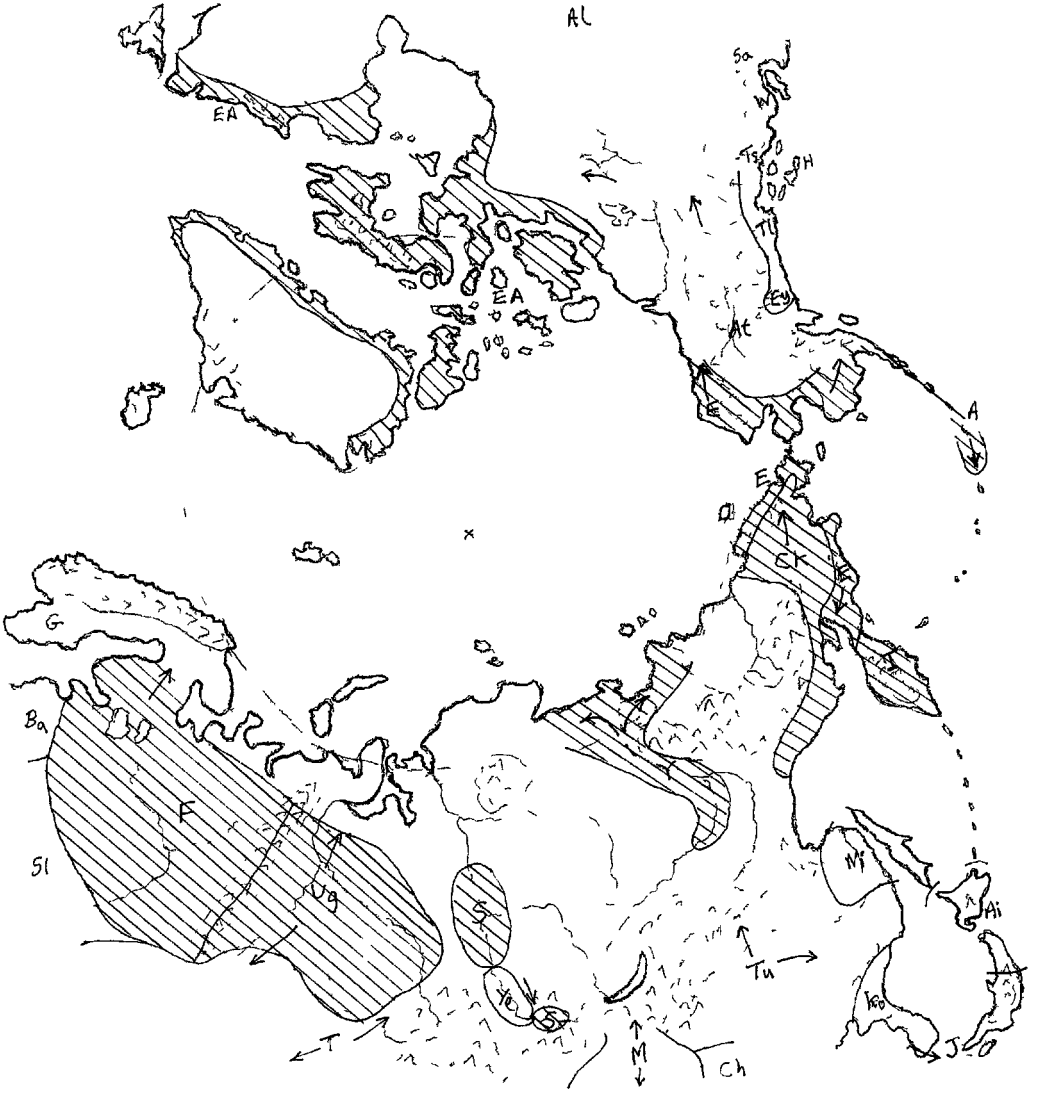
Map 3: 8000 BP



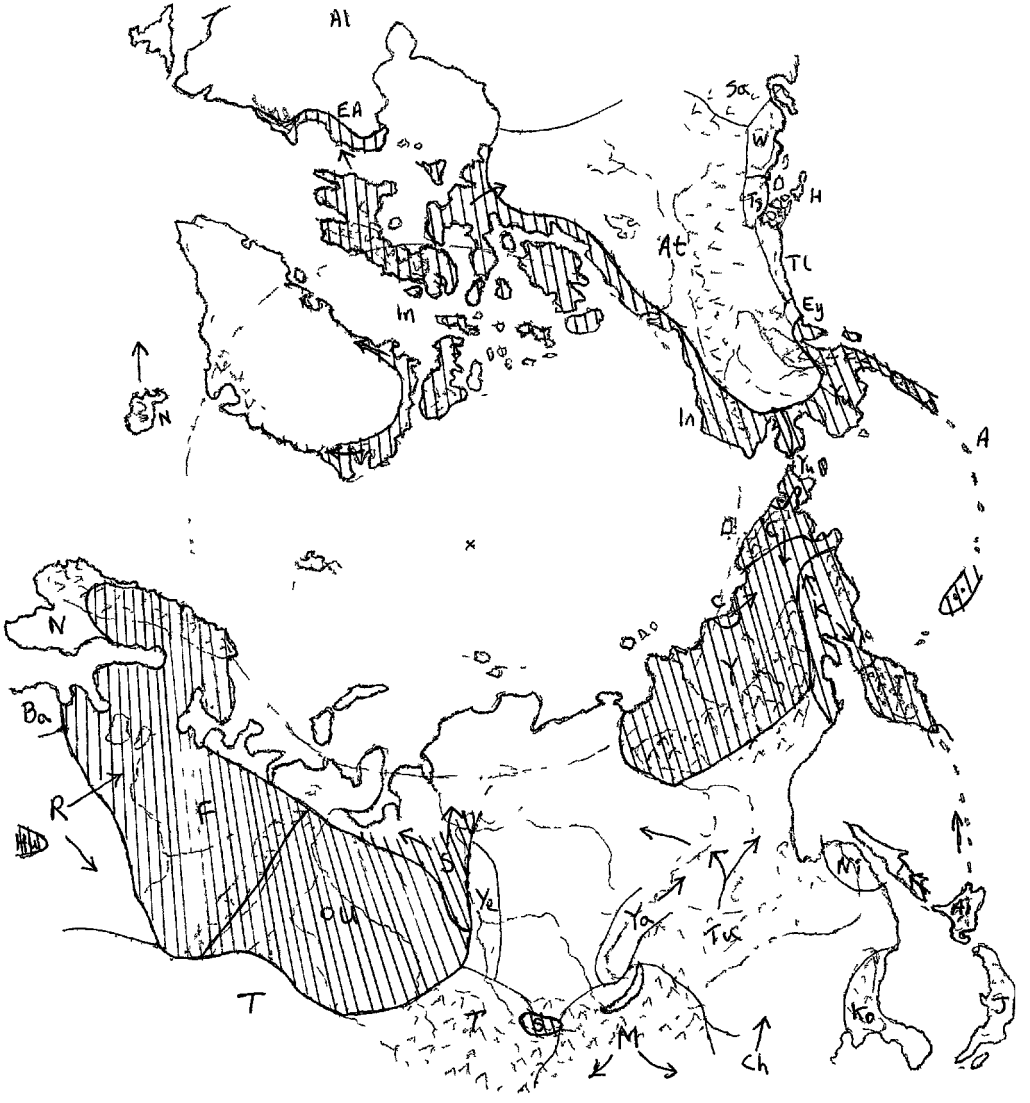
Map 4· 6000 BP



Map 5 4000 BP

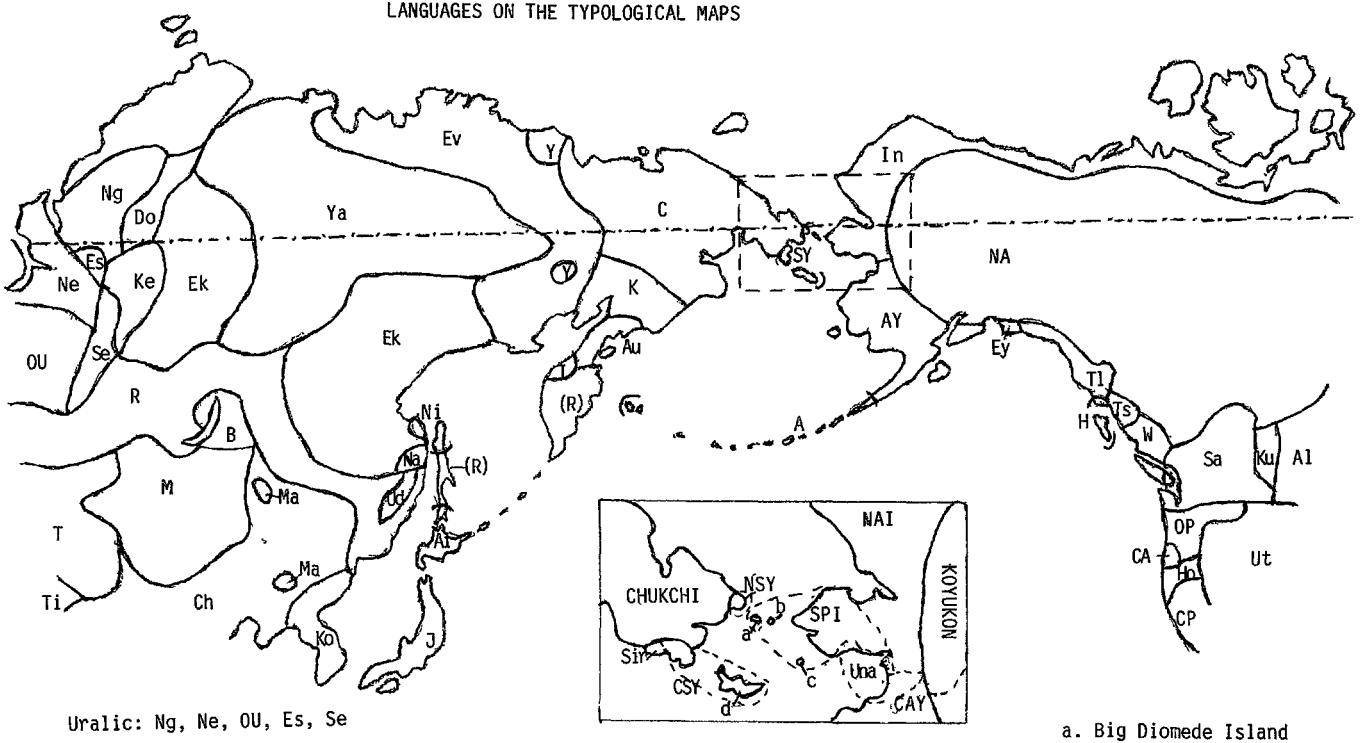


MAP 6: 2000 BP



Map 7: contact (ca. 1000 BP)

LANGUAGES ON THE TYPOLOGICAL MAPS



Uralic: Ng, Ne, OU, Es, Se
Mongolian: M, B
Turkic: T, Ya, Do
Chukotko-Kamchatkan: C, K, I, Au
Eskimo-Aleut: SY, AY, In, A, Sir

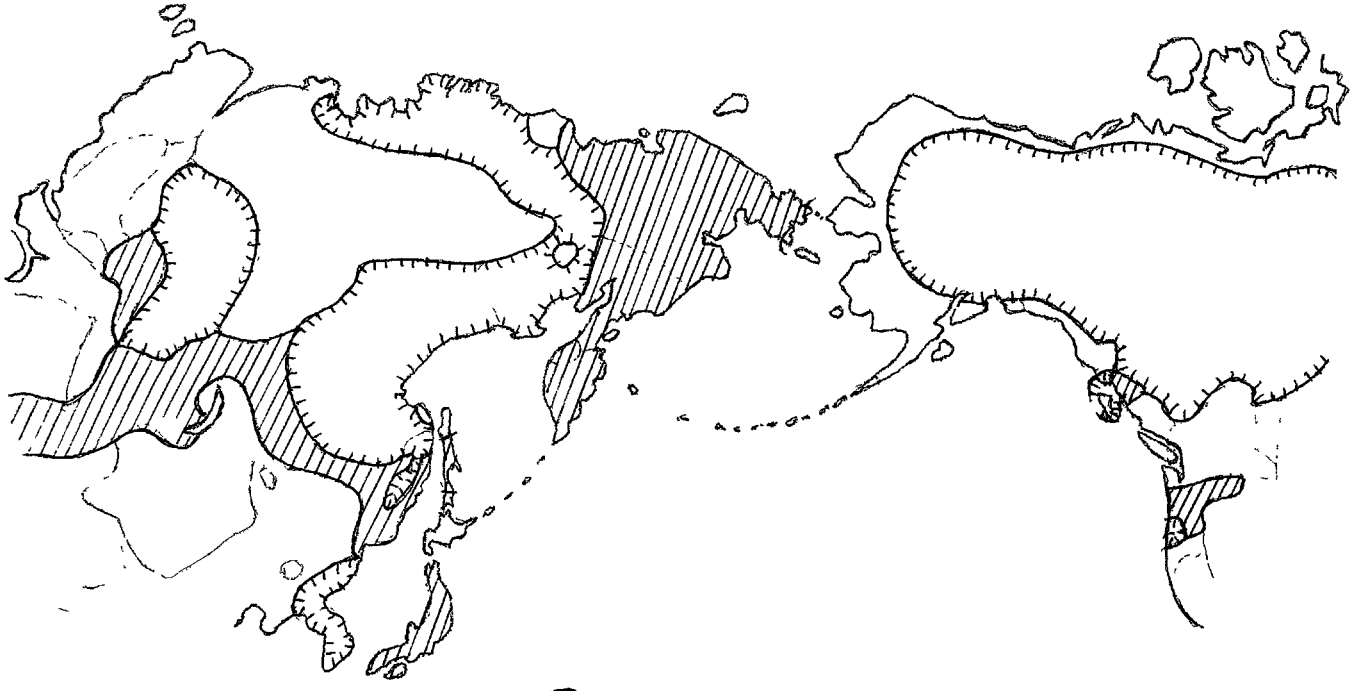
— · — · — · — Arctic Circle

Tungusic: Ev, Ek, Na, Ud
Na-Dene: NA, Ey, Tl, CA

a. Big Diomede Island
b. Little Diomede Island
c. King Island
d. St. Lawrence Island

Map 8

ADJECTIVES



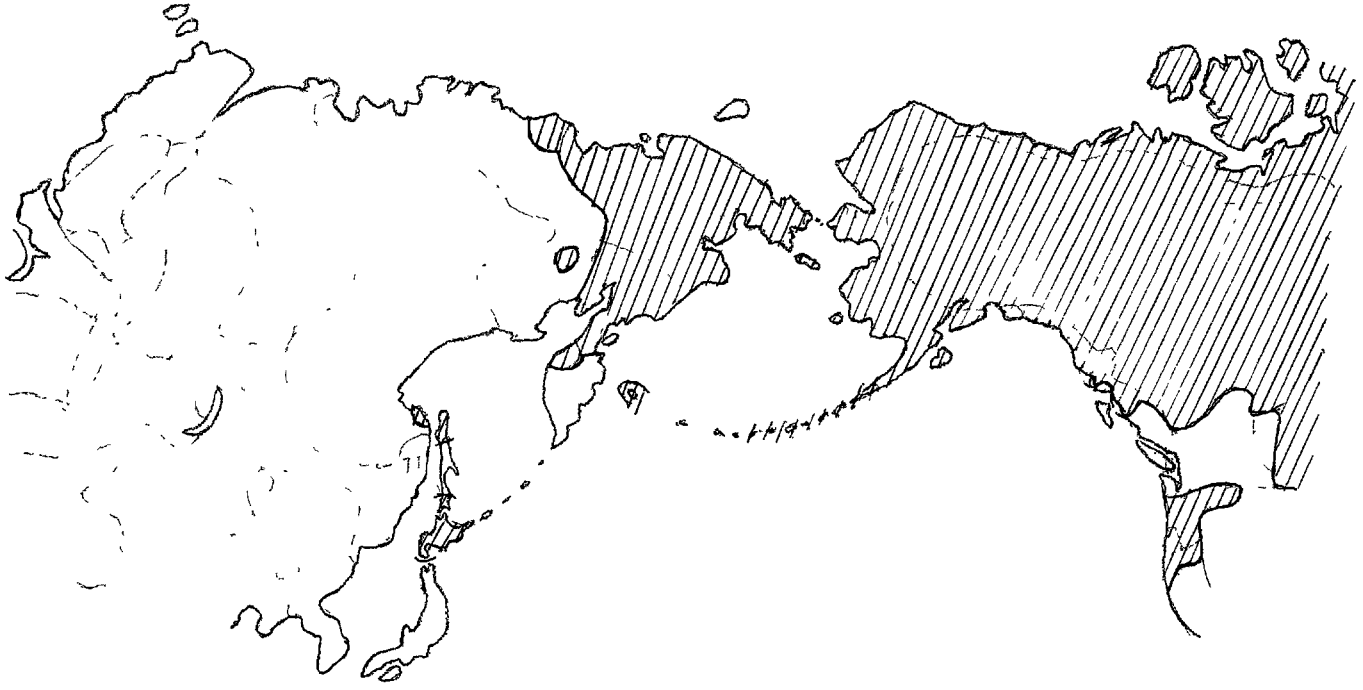
adjectives distinct from stative verbs or participles

limited (some distinct attributive adjectives)

Attributive adjectives noun-like in Ost, S, Alt, Ti & most Pen; Tl, Ey & H have adjectival stative verbs; agreement with head noun not usual except in Ek, Ev, CK, R & to some degree S (also attributive participles/nouns in E agree with head)

Map 9

ANTIPASSIVE/ INDEFINITE OBJECT AFFIXES

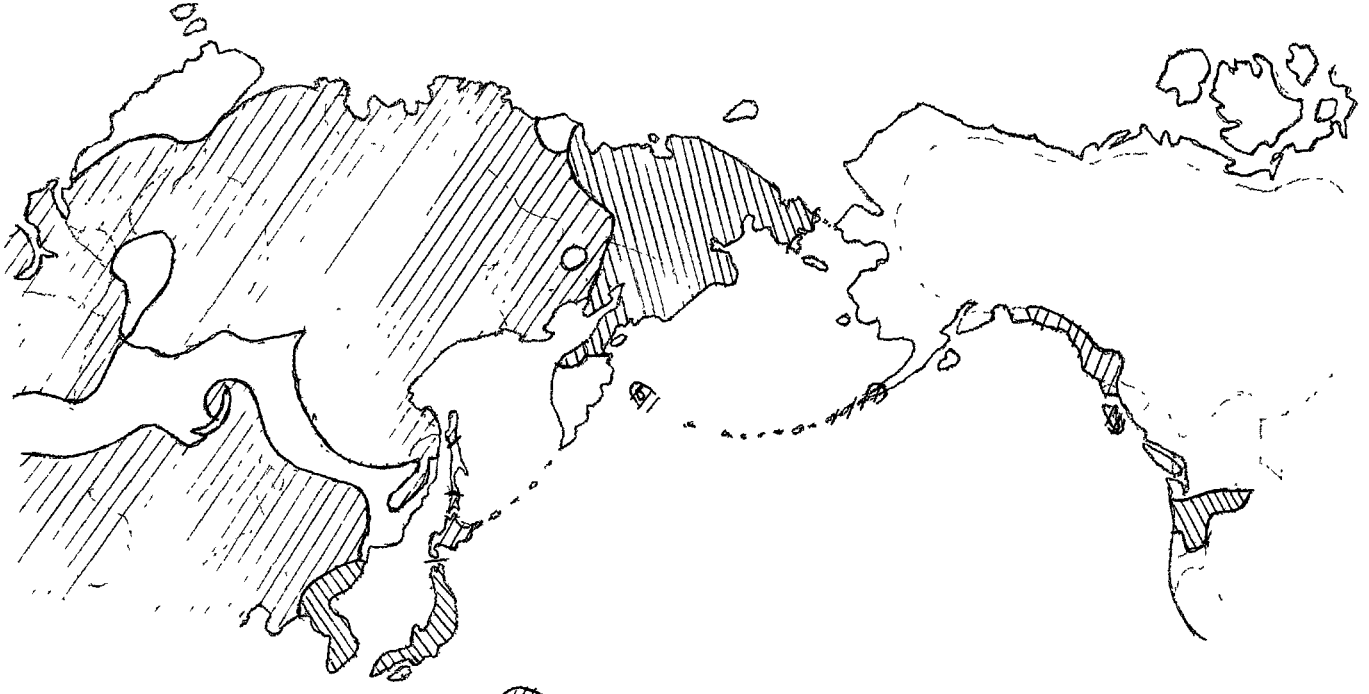


antipassive/indefinite object affix (also some Ut)

Middle voice covers this function in Sa ; indefinite object pronoun in H

Map 10

AUXILIARY VERBS



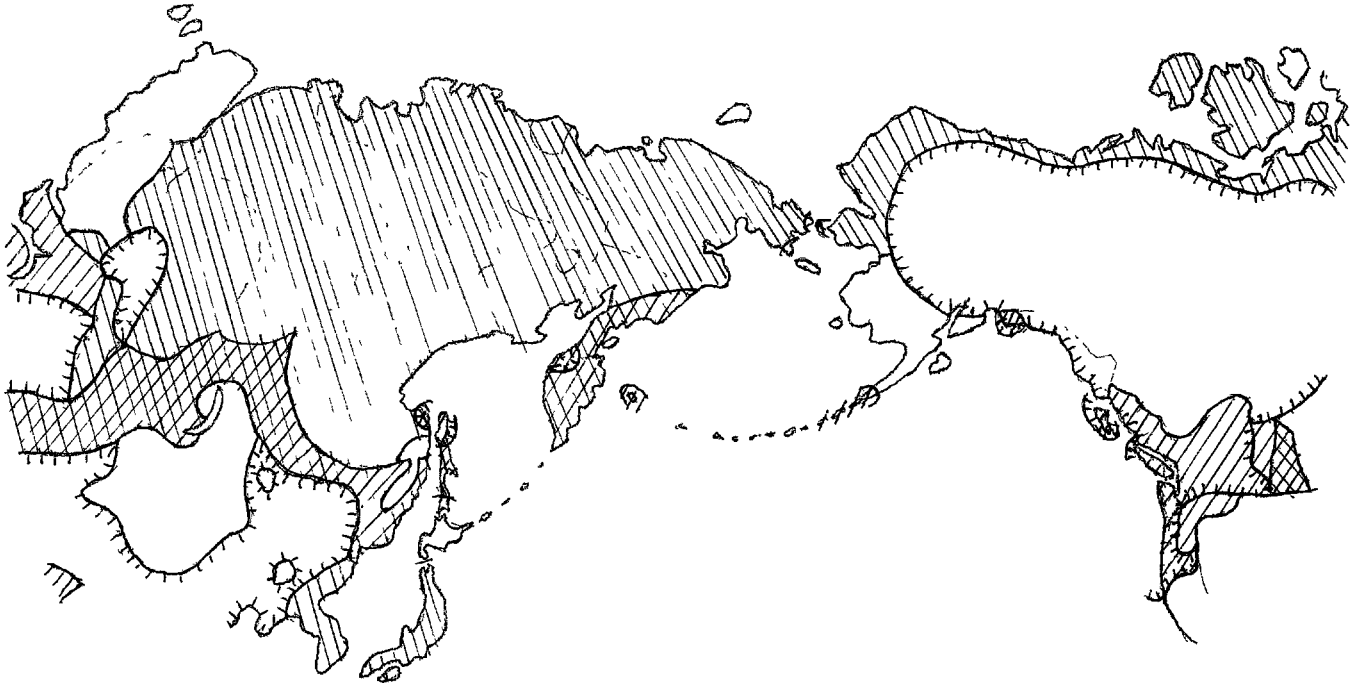
Map 11

mood/tense/aspect auxiliaries (limited in Ya and Sa)

valency-changing/verbalizing auxiliaries (esp. with onomatopoeia in Ni & OP)

Often fused as suffixes in Ya, as in other T; auxiliaries in Sa may express motion towards/away from speaker as in W

CONSONANT CLUSTERS AND MONOSYLLABIC STEMS



Map 12

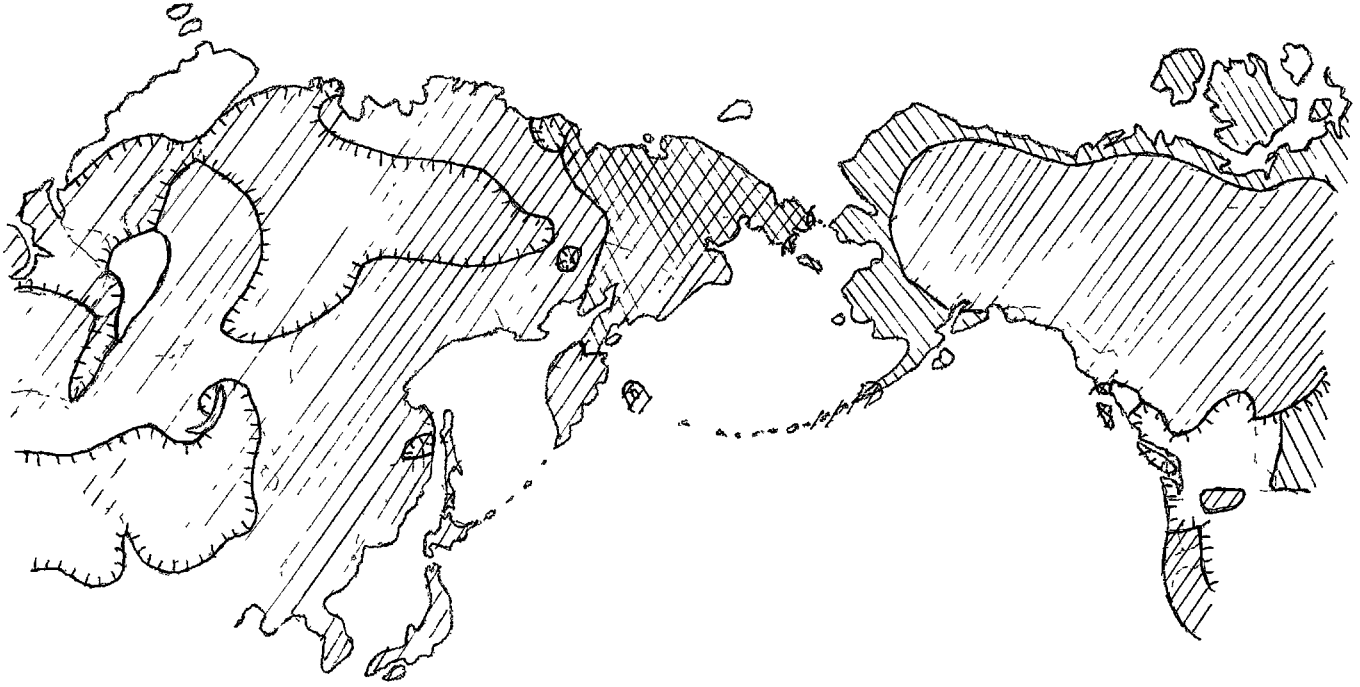
complex consonant clusters (2 or more initially and/or 3 or more intervocalically)

predominantly monosyllabic verbal stems (also some CP, including Maidu)

primary geminate consonants (sporadic in T other than Ya)

Secondary automatic geminates in AY, Ne & I; considerable metathesis of clusters in I and esp. westernmost A; polysyllabic stems developing in northern Ch

COPULAR CONSTRUCTIONS



copular verb/enclitic

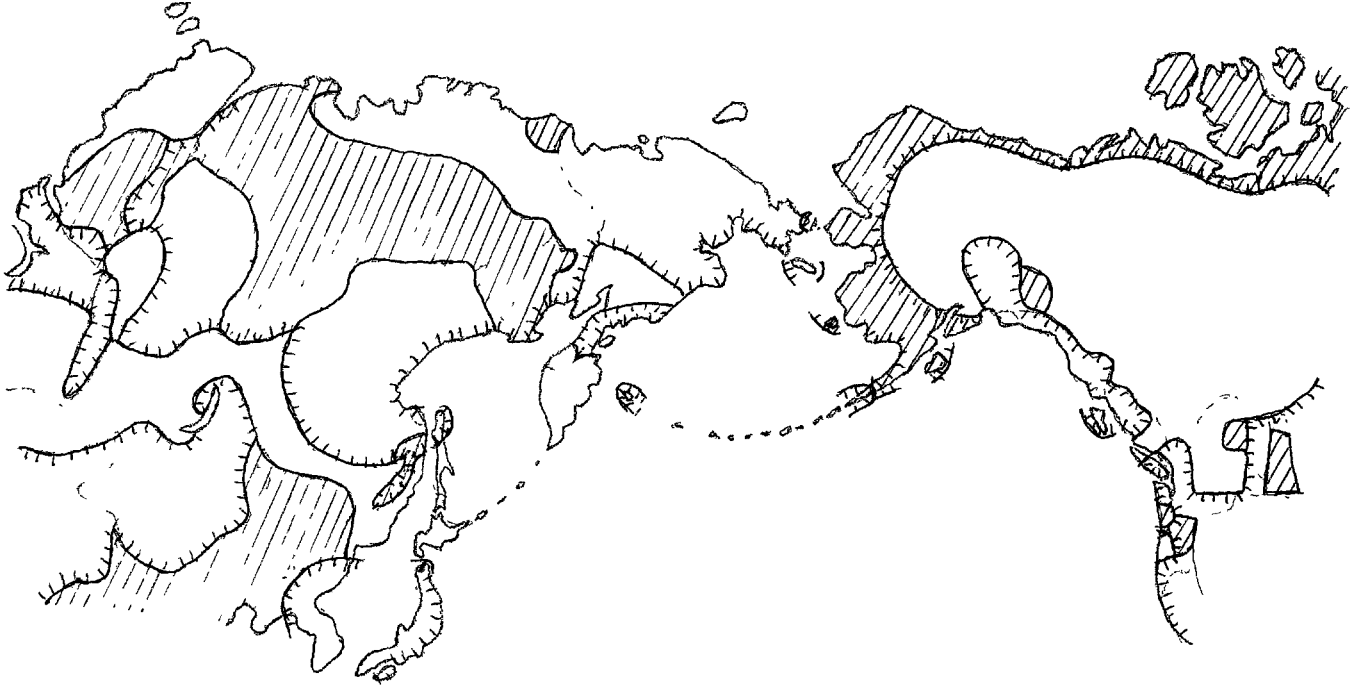
morphological copula (Ø with 3rd person in C and A1)

Ø-affix copula/conversion (also eastern Aleut)

Copular verb limited to non-present in R and may be incorporated in A_1; in Sa and W all content words are predicative but may have nominal functions; copular suffix also in Shoshone Ut

Map 13

DIPHTHONGS AND LONG VOWELS



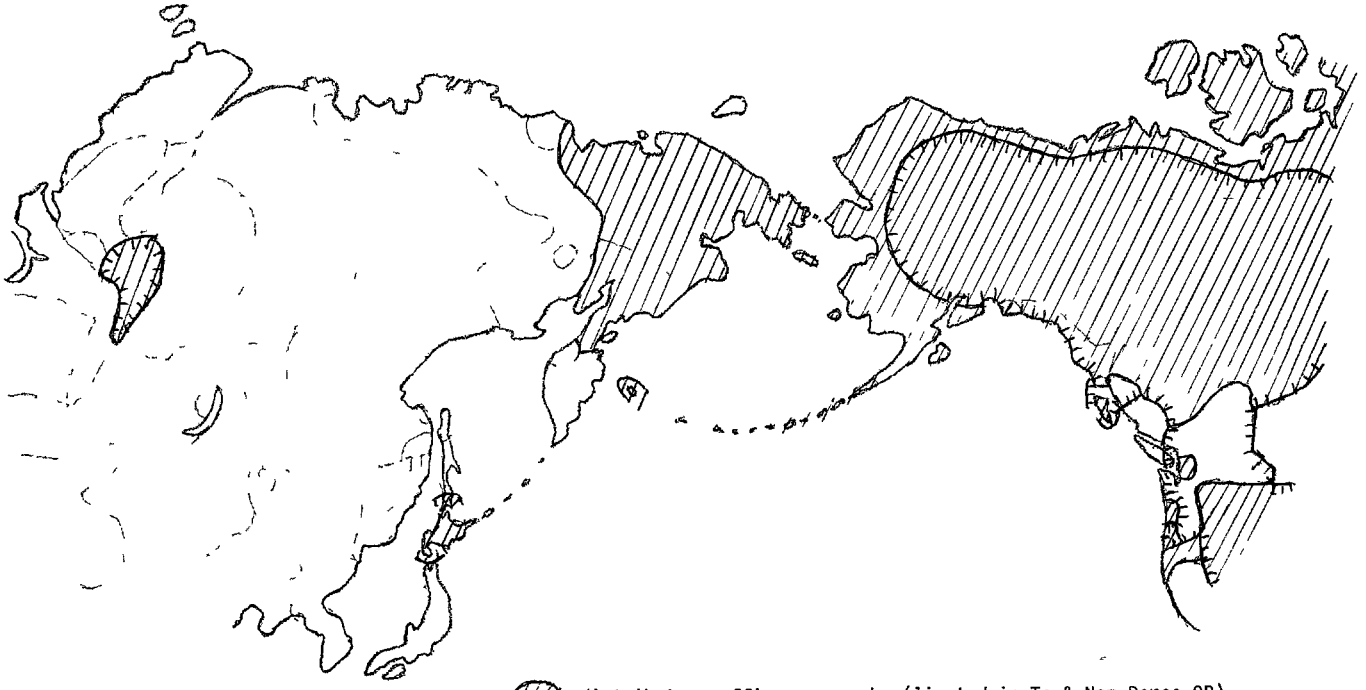
Map 14

diphthongs (also some Ut& Ts; limited in M & Kutchin At)

long vowels

Full versus reduced vowels in some At, Ost, I & M

DISTRIBUTIVE AFFIXES AND SUPPLETIVE PLURALS

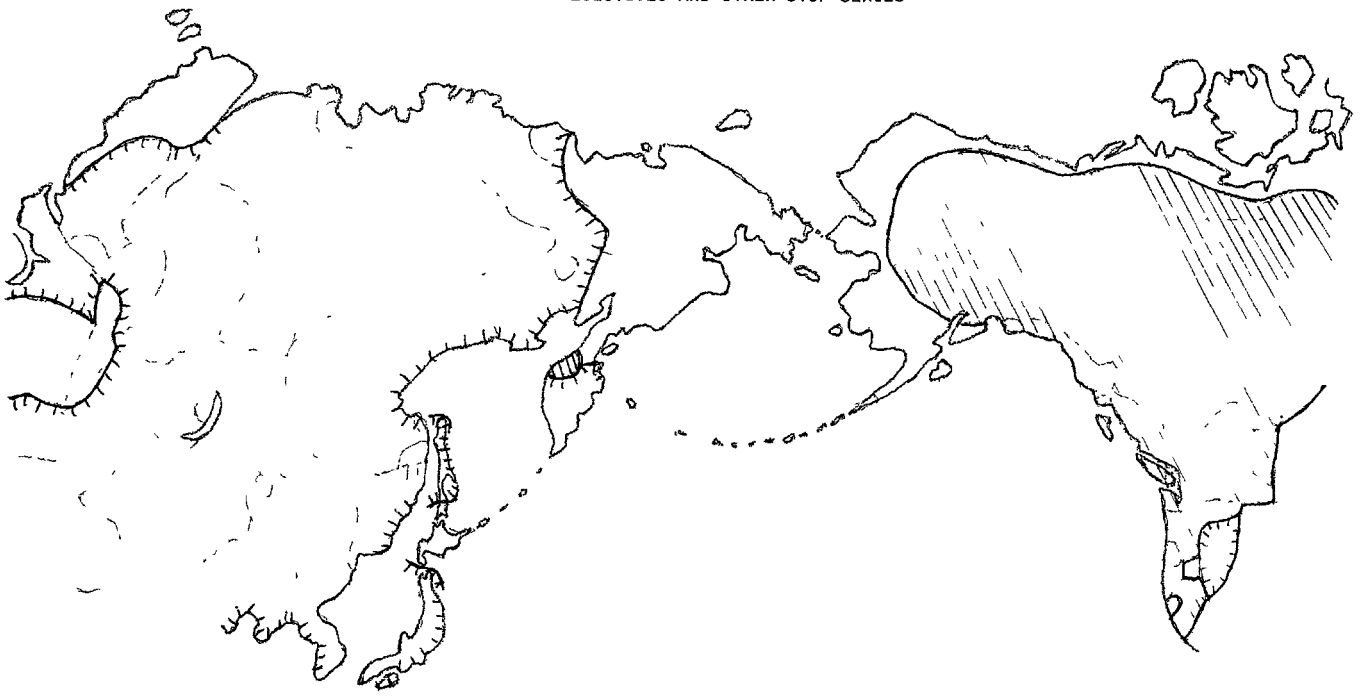


distributive affixes on verbs (limited in Ts & Nez Perce OP)

suppletive plural verbs

Interior Sa has glottalization rather than distributive affixes, which are found in some coastal Sa; the marking of object number is on the verb rather than the NP in Ey, H & to some degree Tl, where the morpheme is proclitic

EJECTIVES AND OTHER STOP SERIES

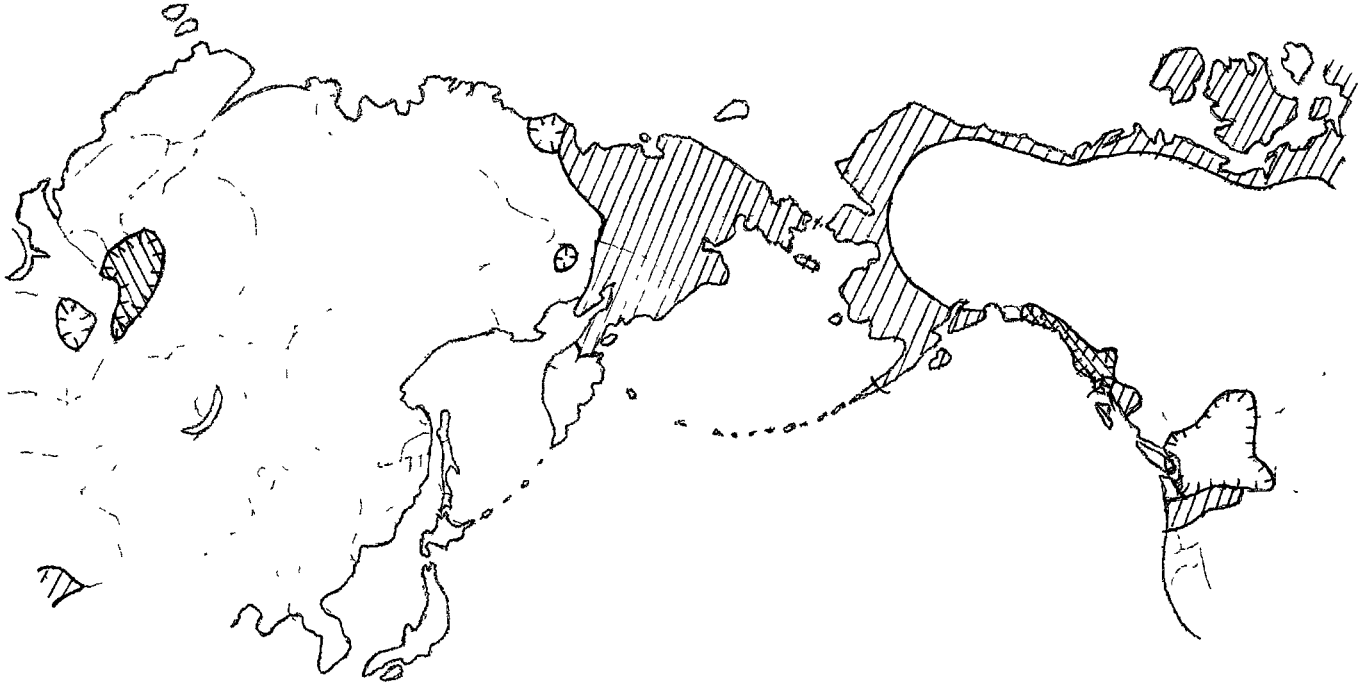


ejectives (also Ritwan Yurok)

more than one stop series but no ejectives

All languages with ejectives other than I have at least 3 stop series; voiced series intervocalic only in Y; glottalized continuants in H, Ts, W, most Sa, Ey, Hare At, Nez Perce & Yokuts Pen & Ku (glottalized lateral also in Tutchone At & Tl); some eastern Ni only 2 stop series; 'constricted' consonants in Ko

ERGATIVE AND STATIVE/ ACTIVE MORPHOLOGY



Map 17

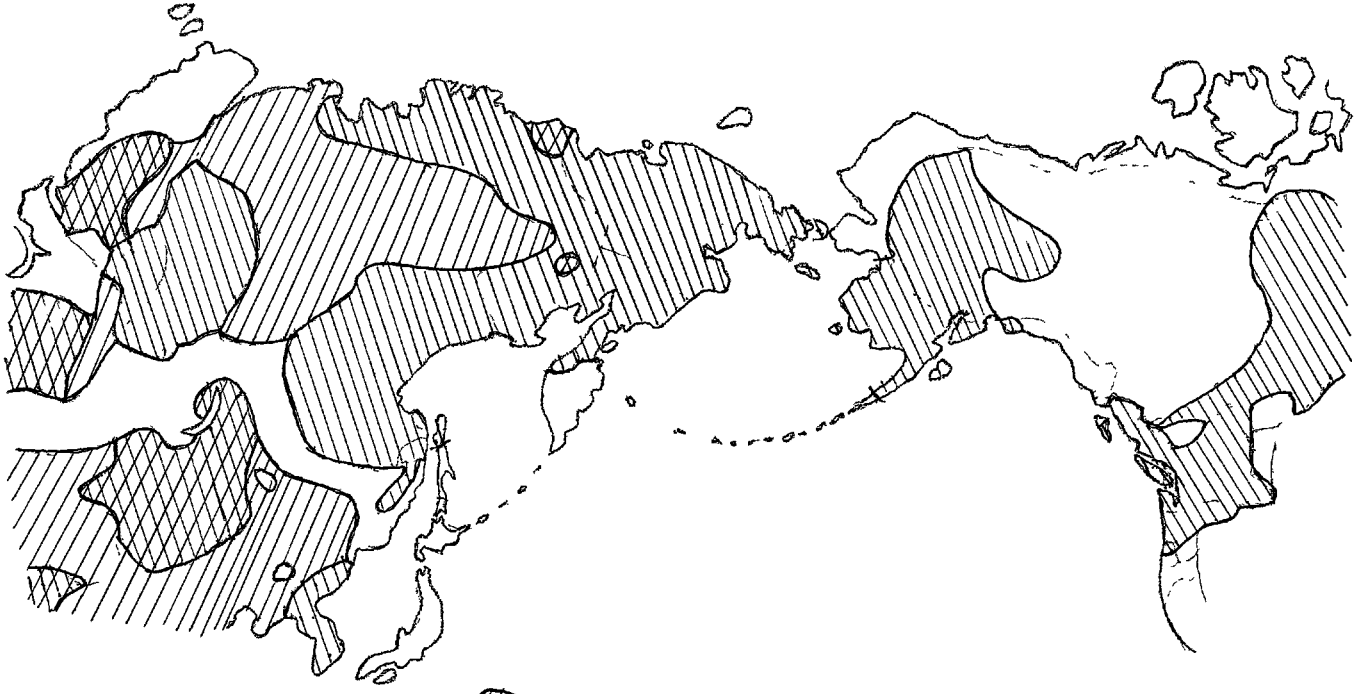
ergative morphology (traces only in A)

ergative sub-systems only (also marginally in H)

stative/active (also Pomo Ho; vestigial in Ke)

Elsewhere mainly nominative-accusative morphology, but northern Ch has an ergative construction; Al has hierarchical dominance

FRONT ROUNDED VOWELS AND SCHWA

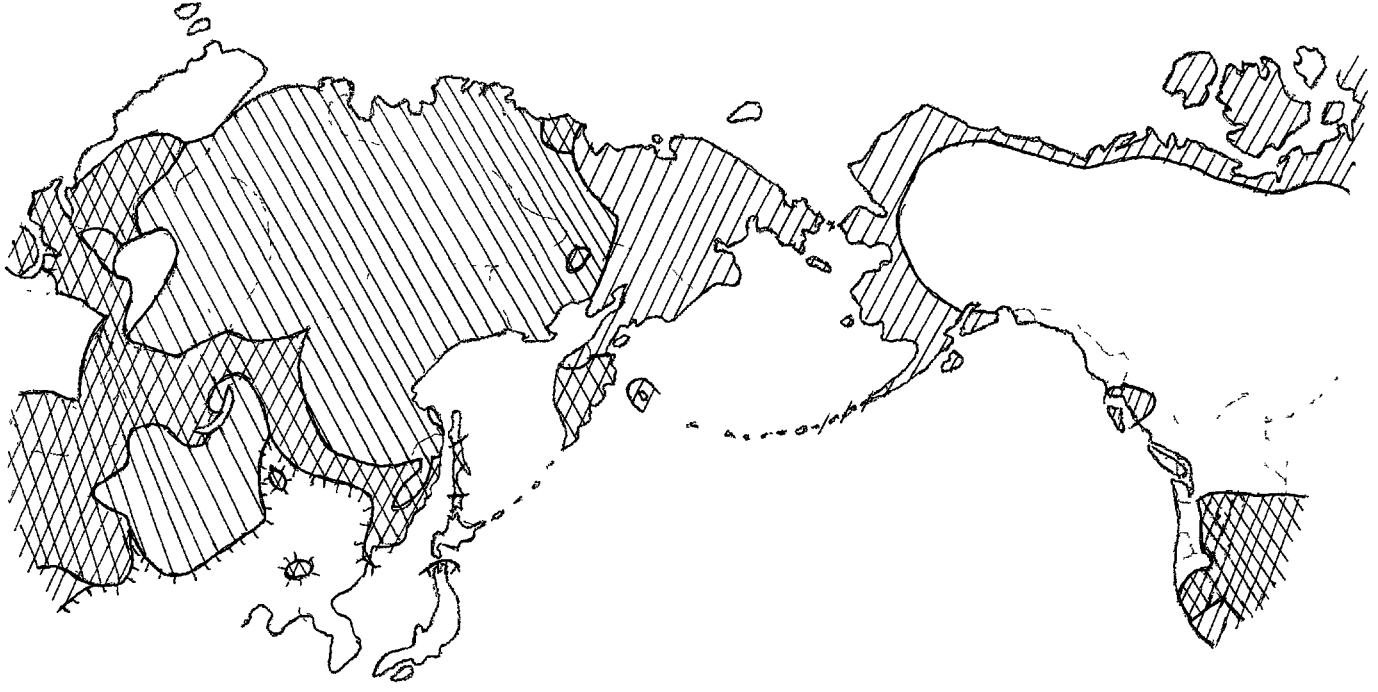


front rounded vowels
schwa
} both = central rounded vowels in M

Map 18

Schwa also in some Ch, southern H, some Ho & CP, and in affixes at least in Y; schwa may be stressed in SY, Ng, C, Y & Ev; some Ost, Ts, Ya, Takelma OP & most Ho & CP have /ɨ/ rather (also some S as back allophone of /i/)

GENITIVE AND ACCUSATIVE CASE MARKING



Map 19

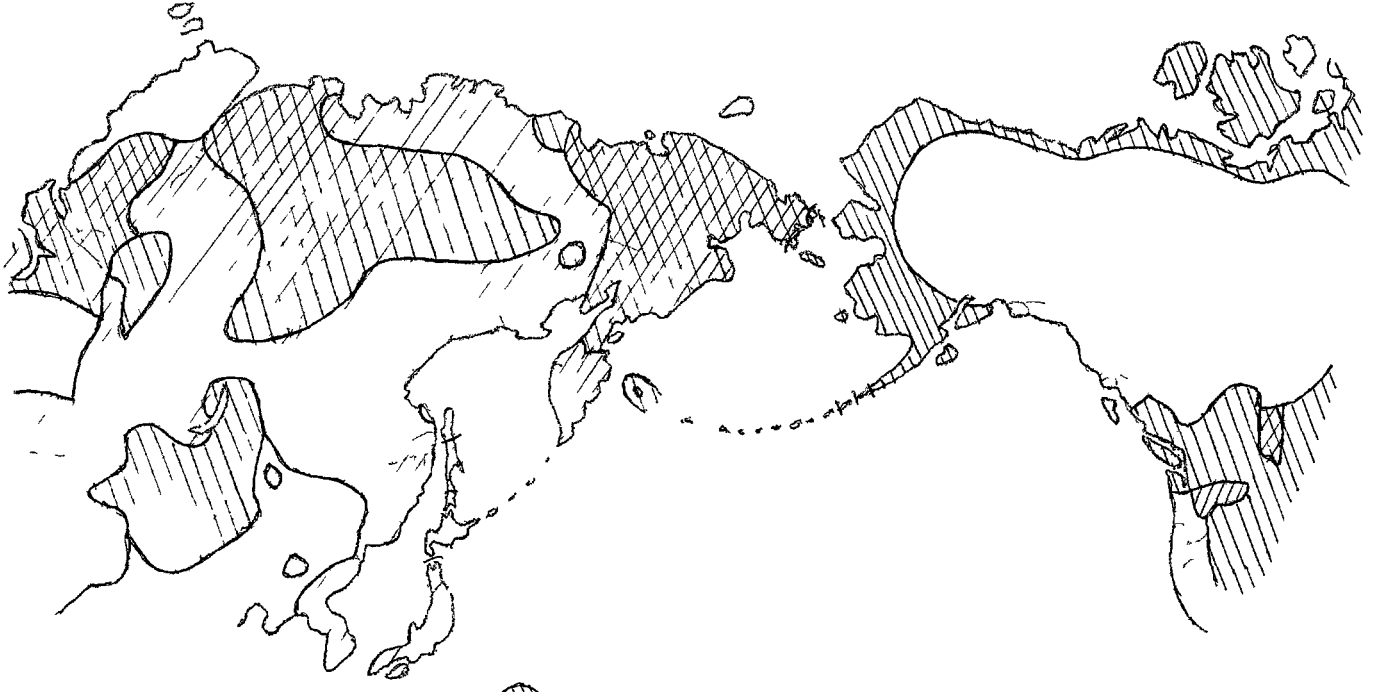
genitive case marking (also some M dialects and Siuslaw OP)

accusative case marking

genitive and accusative case particles (postposed)

Genitive and accusative marked mainly by stem alternations in Ng; accusative marked only with 3rd person subject in Y; accusative marking restricted in Ur and T to definite objects ; 'possessive' and 'objective' cases in Ut

'HAVE' CONSTRUCTIONS



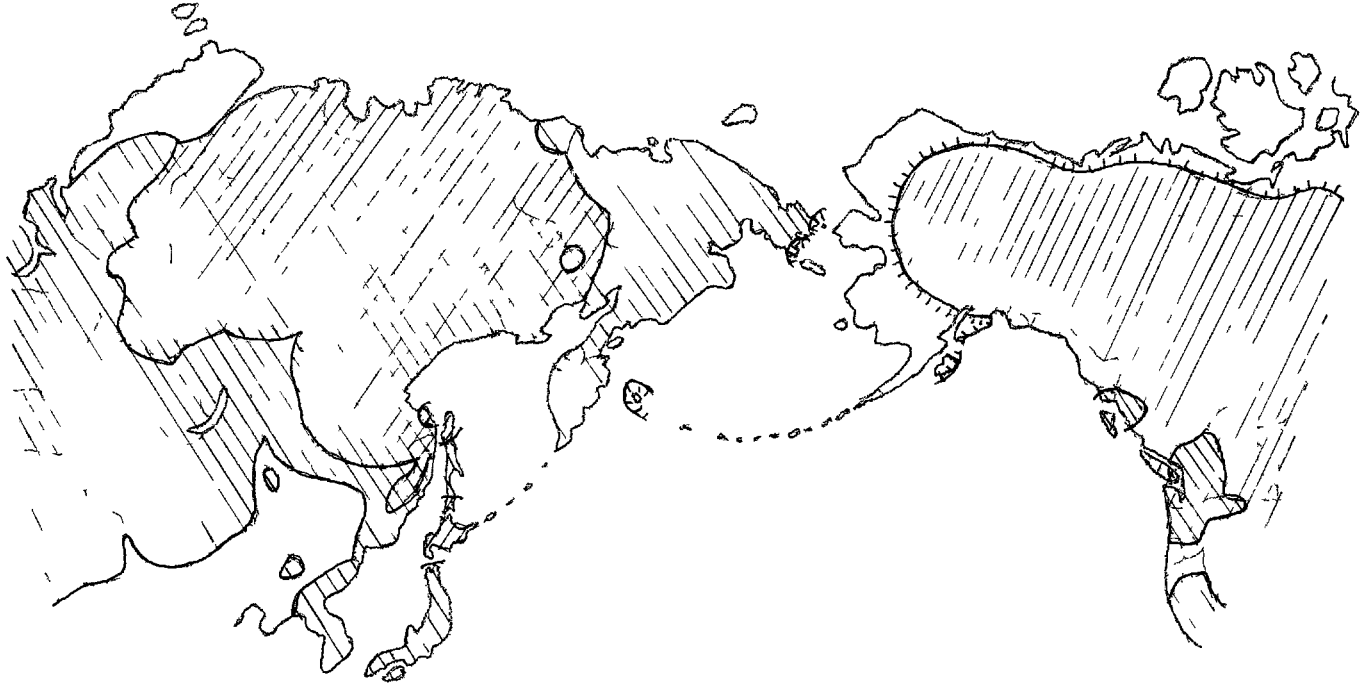
Map 20

morphological 'have' affix

'be' + locative/possessive construction

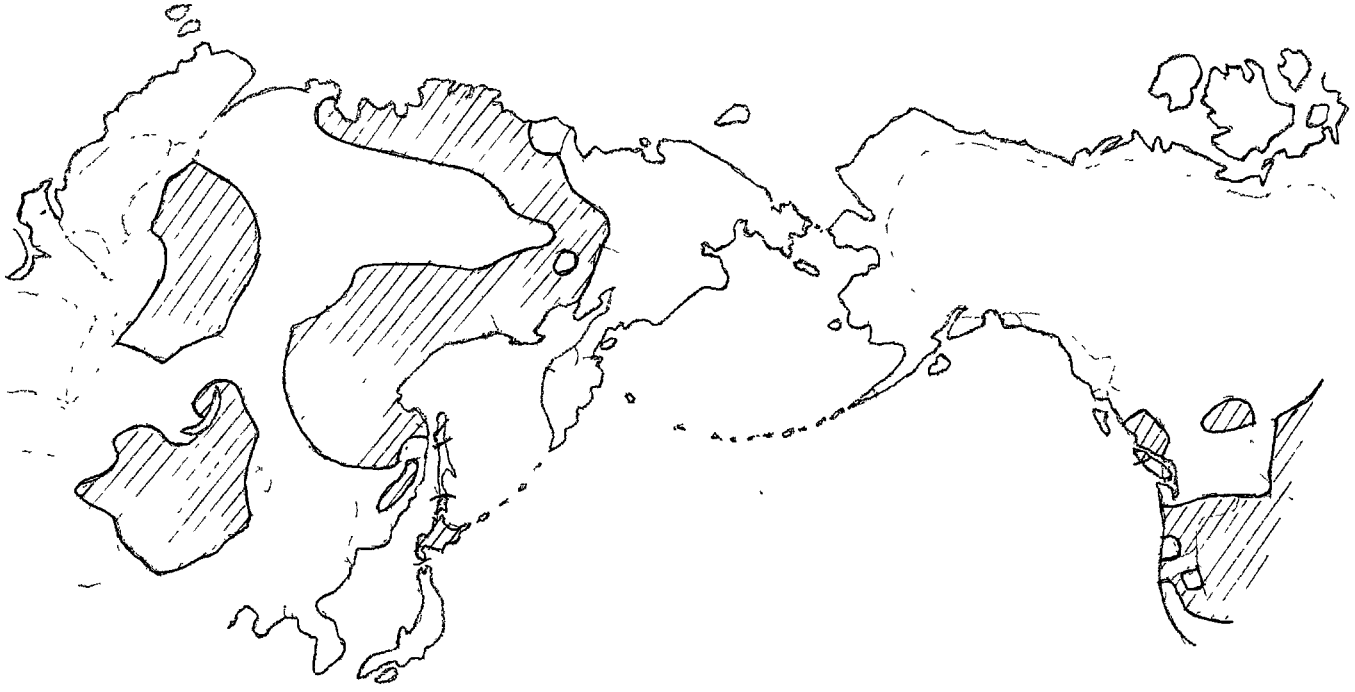
Elsewhere 'have' verb usual, but Pomo Ho at least has a possessive type construction, and Y and some S also have a 'have' verb

HEAD/ DEPENDENT MARKING



Map 21

INCLUSIVE/ EXCLUSIVE 1ST PERSON PLURAL

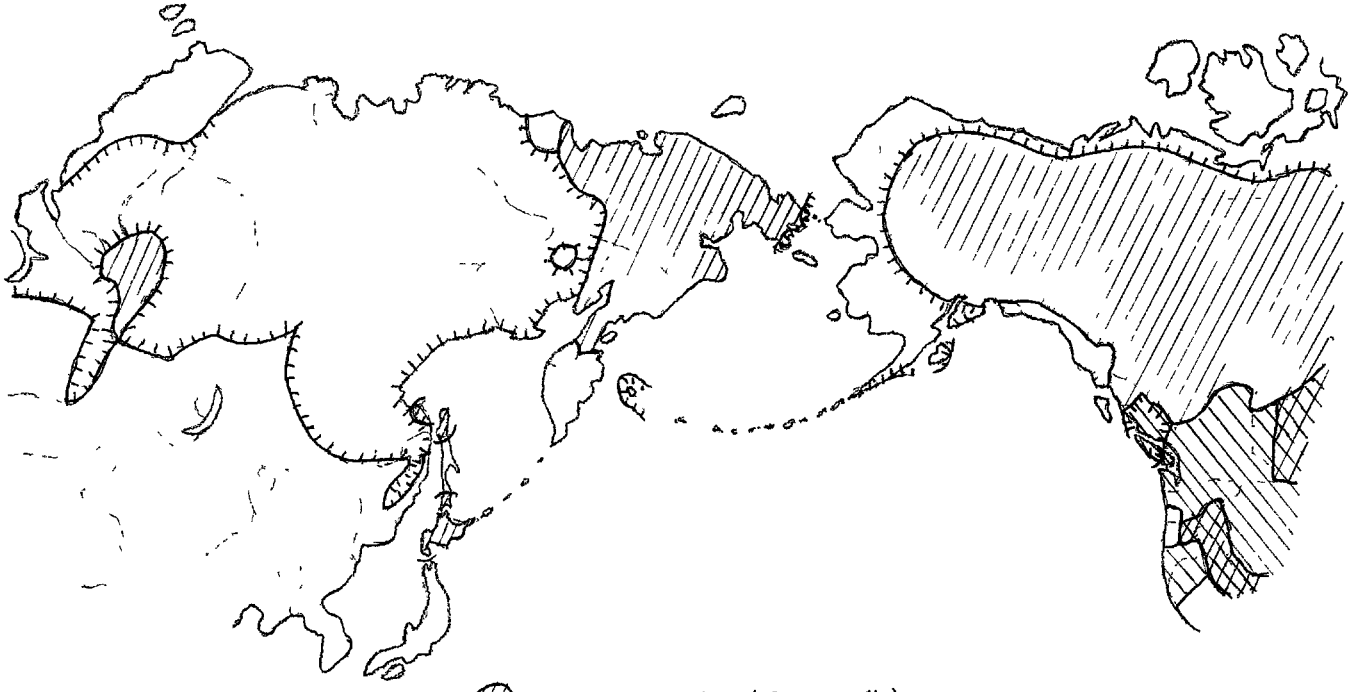


Map 22

inclusive/exclusive 1st person plural

Only in oblique cases of personal pronouns in B

INCORPORATION



noun incorporation (also some Ho)

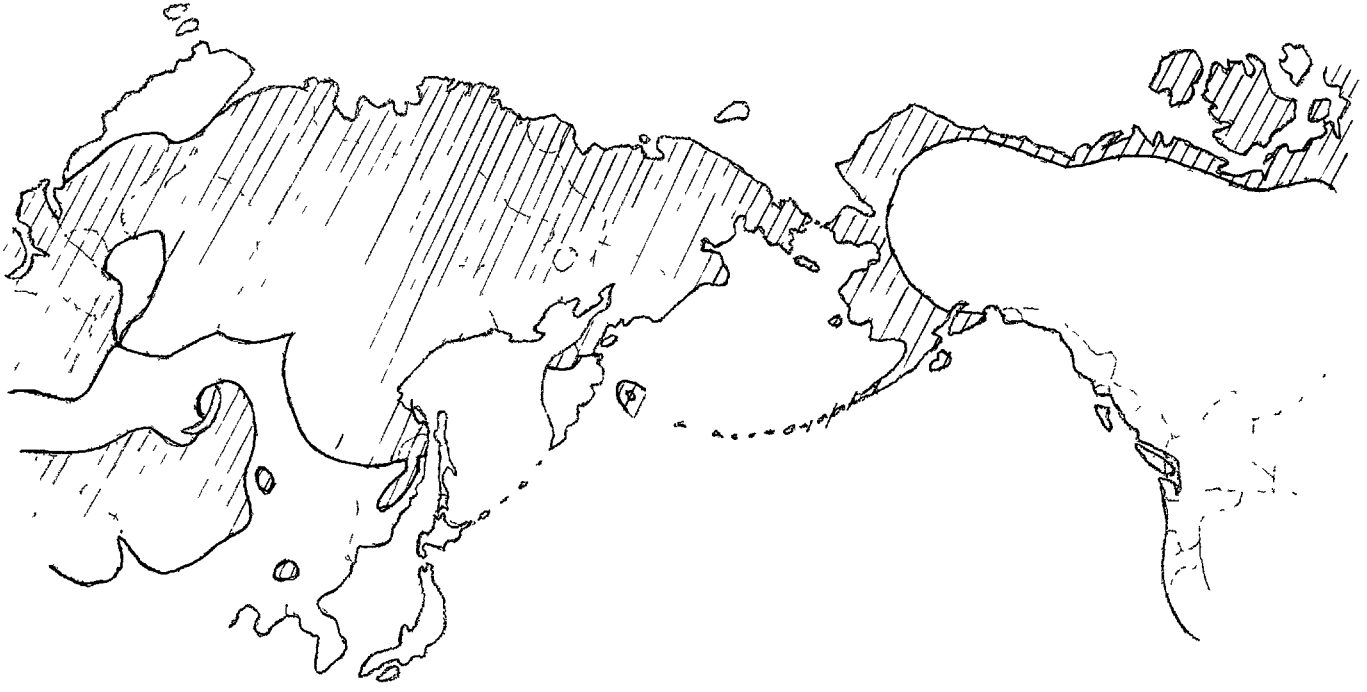
lexical affixes

suffixing incorporation (also some in Y, M, T, Ku, Yokuts CP, Ni, Ma & some Ut & OP)

Tl, Ey & H have some instrumental prefixes/proclitics, and Sa has some 'incorporating' stems & affixes; postpositions incorporated in At & Tl, and pronouns in the Y reflexive construction; also some noun incorporation in Ku; directional/locational affixes also in H & ND & (proclitic) in Ts; incorporation of adjuncts in CK, Ai, Y & Al

Map 23

INDICATIVE BASED ON PARTICIPLES

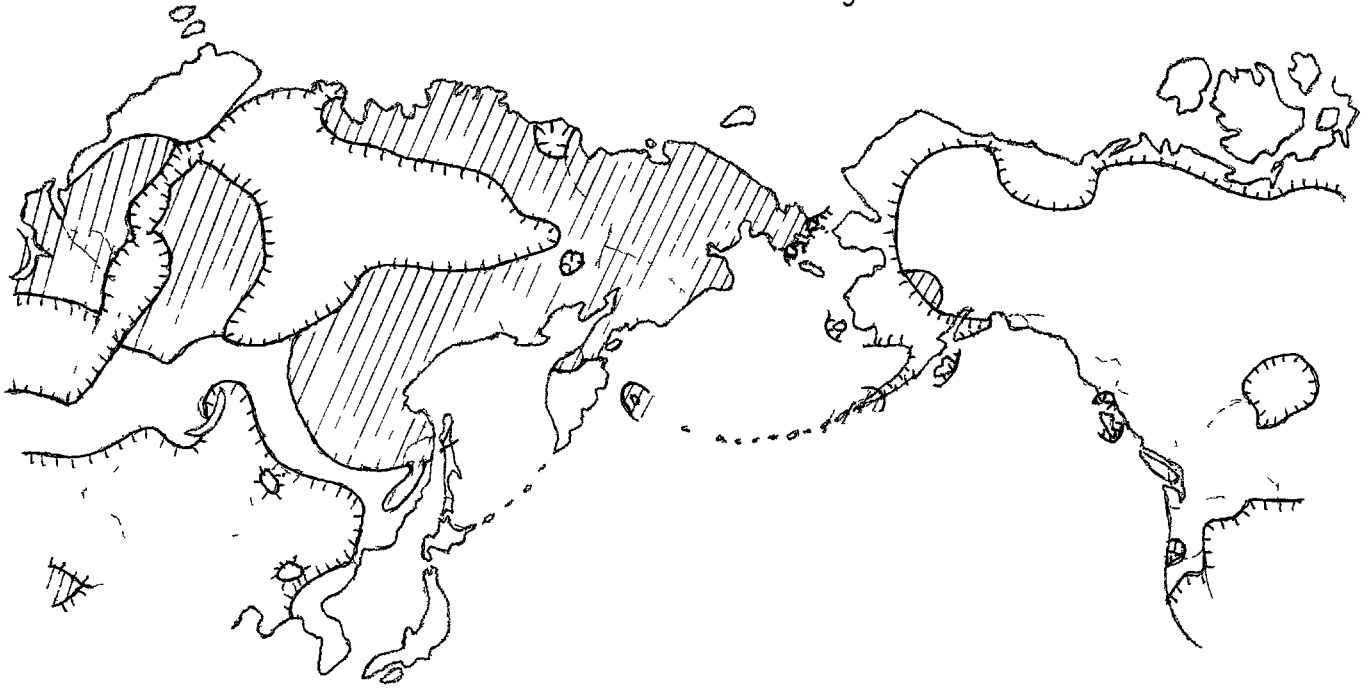


Map 24

indicative based on participles (also R past)

Limited in Y; also a simple aorist in S, Ost & CK; in T & M indicative often based on other nominalizations; distinct interrogative mood in northern S, Y, E, W & Blackfoot Al; distinct perfect & present participles in Alt, Ur, A, Yu & some In

INITIAL AND INTERVOCALIC /ŋ/

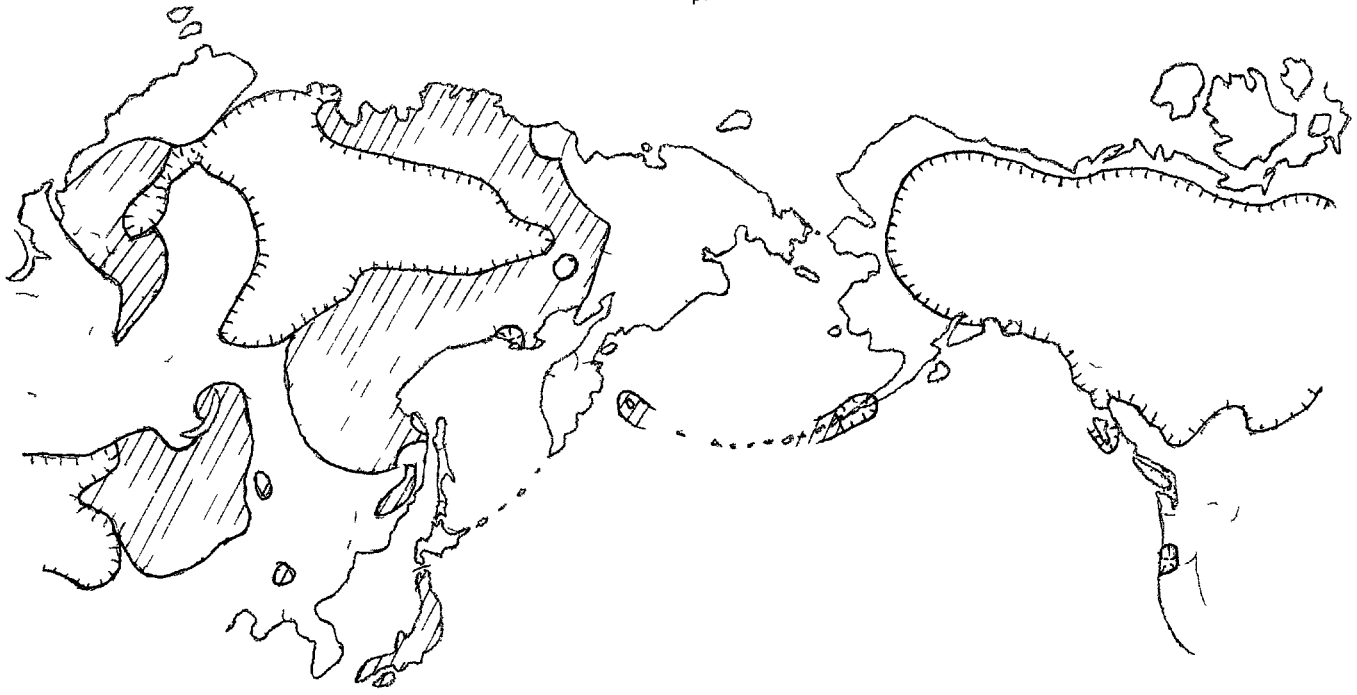


initial (& intervocalic) /ŋ/ (also some Yu by loss of /ə/)

non-initial /ŋ/ only (also some coastal Sa & OP; allophonic only in J)

Map 25

INITIAL /p/



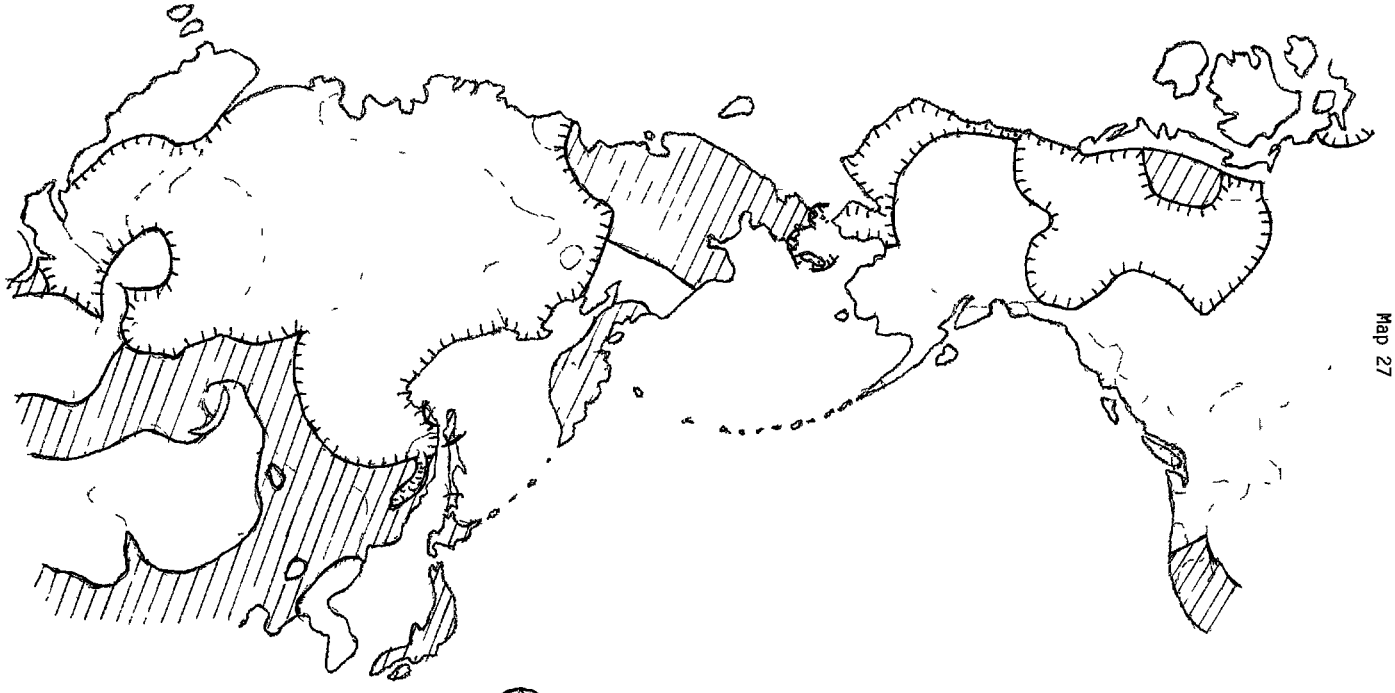
Map 26

initial *p into /h/ or /f/ (also Ø in some eastern Ek)

no initial /p/ (no /p/ at all in ND & Tillamook Sa)

*p into /b/ in T & intervocalically to Ø in Ke, medial *p to voiceless /m̥/ in A, initial /m/ denasalized in A, eastern I, some southern W and coastal Sa and absent in ND (except secondarily from *w in some NA, CA & Ey)

INITIAL AND INTERVOCALIC /r/



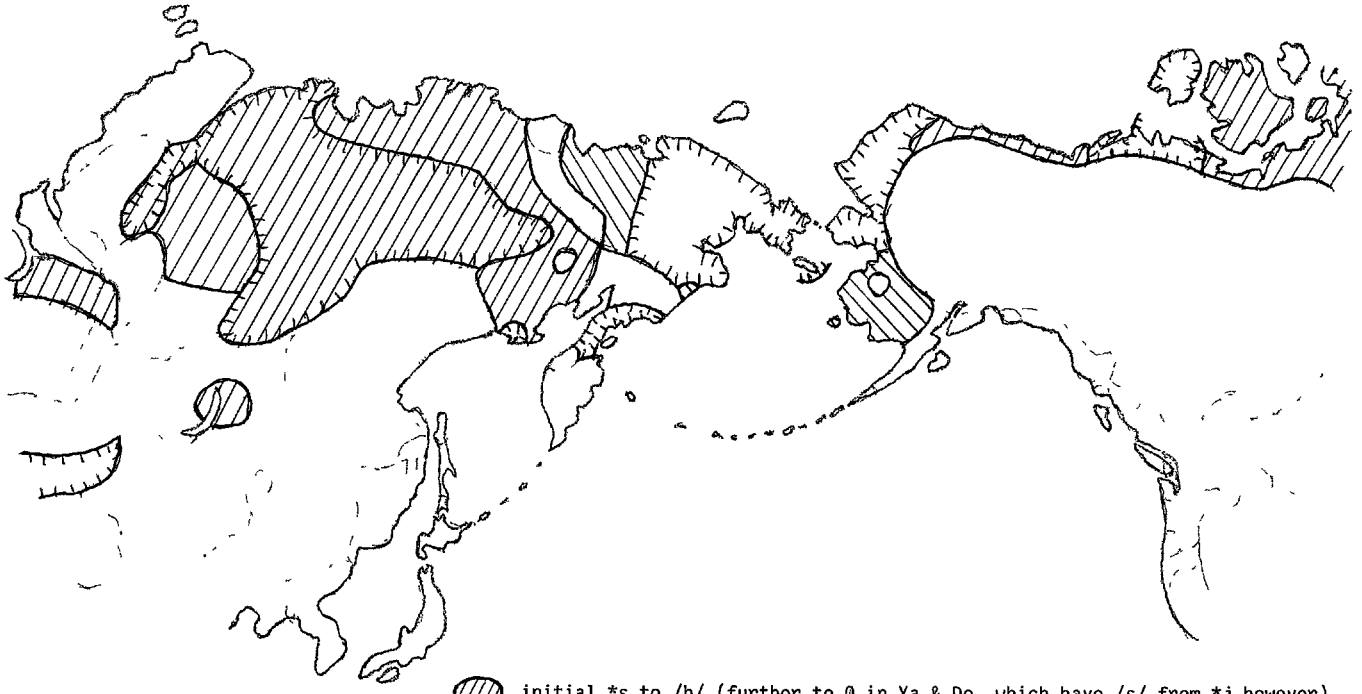
Map 27

initial (and intervocalic) /r/

non-initial /r/ only (/ʒ/ in Netsilik In at least)

Kutchin, Han & Ingalik At have /z^r/; initial /r/ only in loans in I, J & SY; /r/ alternates with /t^s/ in Sir; pharyngealized /r/ in Coeur d'Alene Sa

INITIAL /s/ AND /c/



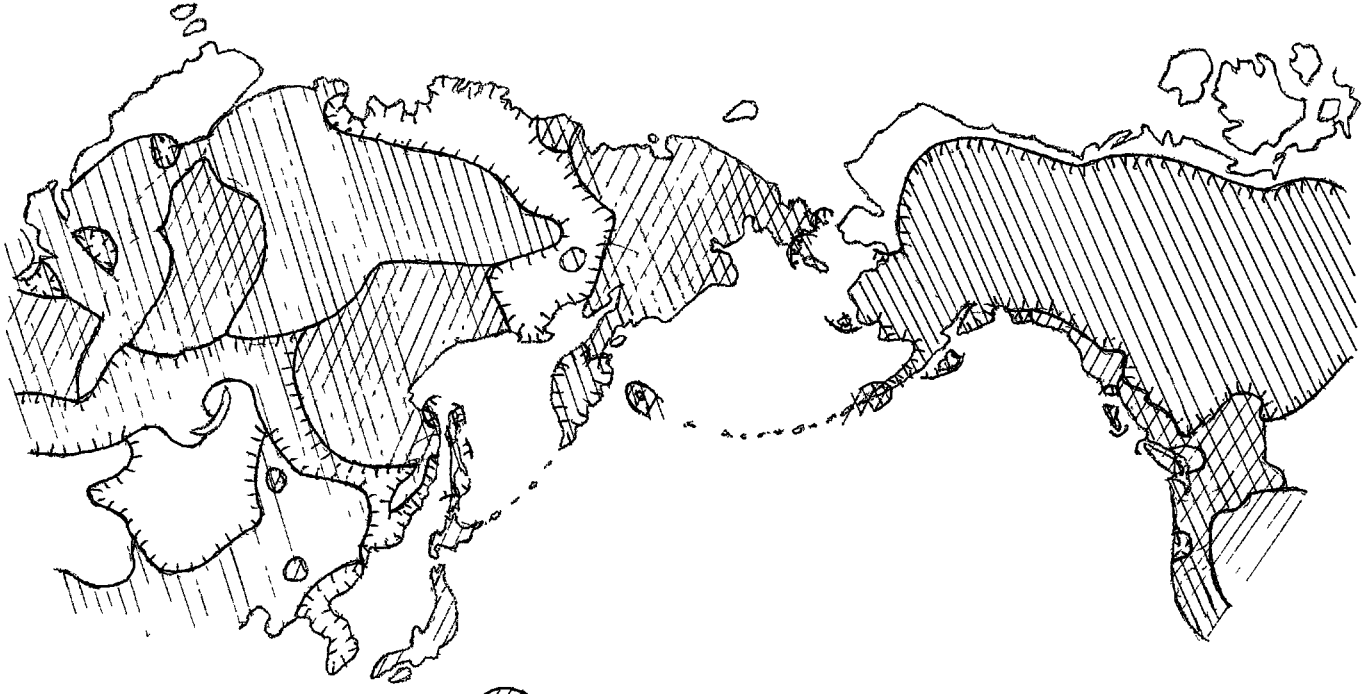
initial *s to /h/ (further to ∅ in Ya & Do, which have /s/ from *j however)

initial *c to /s/ (or /š/)

no initial /s/ (but limited in AY)

Original *s lost or merged in all S & Y and to /ɬ/ in some Ost and Koyukon At (to /θ/ in some other NA); *c to /t/ in all northern S & Ke; initial /s/ from *iŋ- & *ij- in some AY; intervocalic *s to /h/ in Ya and some In, Ev & Ek (also *-c- in Ya); /c/ v. /č/ and /s/ v. /š/ in H, Tl, some At, Sa, Ho, CP & OP

INITIAL SONORANTS



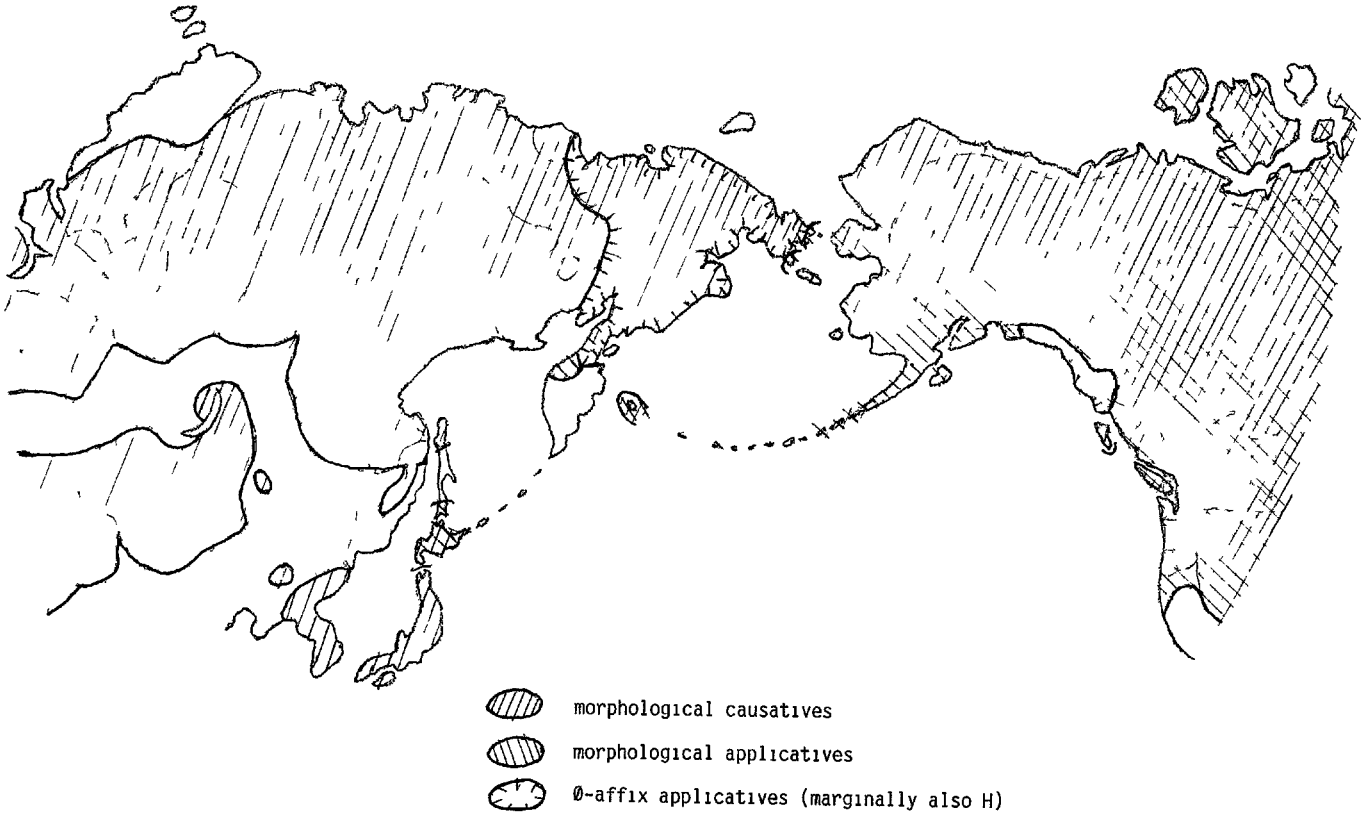
initial /j/ and /w/

initial /j/ only (also /w/ in some coastal AY & Naukanski SY, also eastern Ni)

initial /l/ (also /w/ in Se)

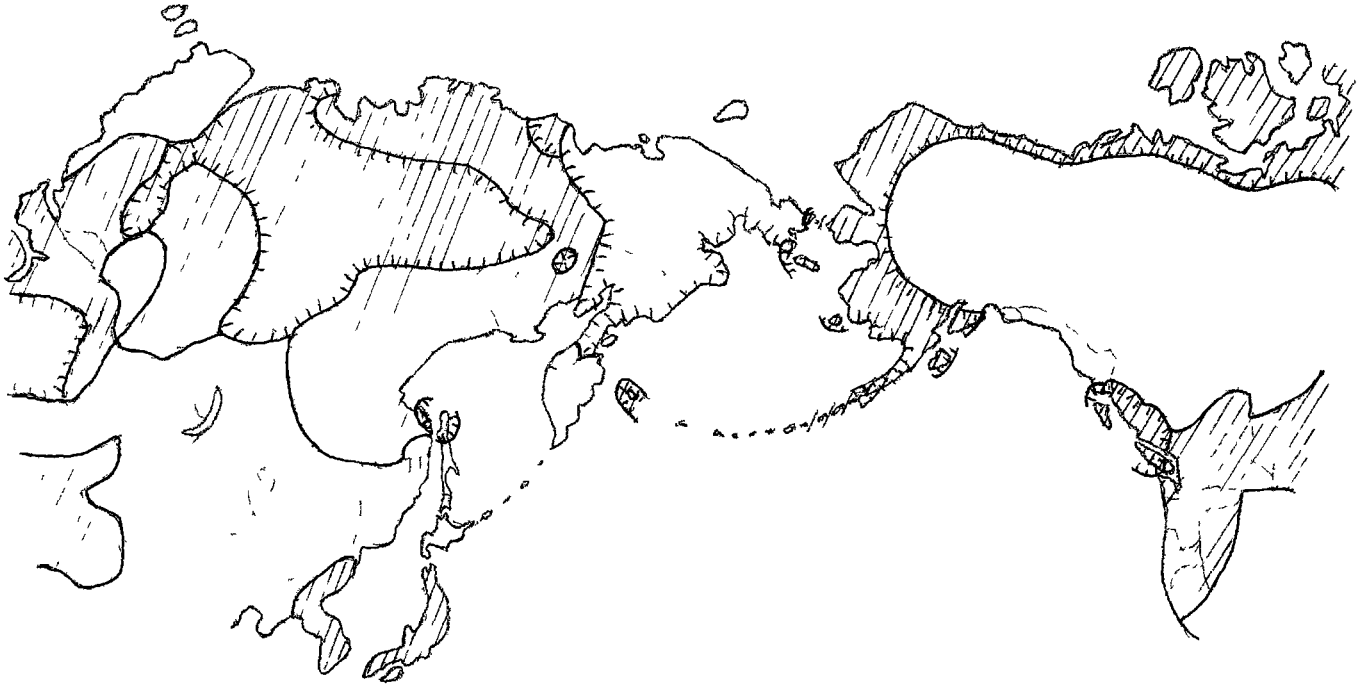
Initial /j/ in loans only in I, and pronounced [dʒ] in most Ev & western C; initial /l/ glottalized in H, and in Yu from loss of initial /ə/; initial /w/ voiceless in most Yu but > /k^{w}/ in Nunivak and /m/ in Sir, Ev & Attuan A; initial *w and *j into stops in some Sa

MORPHOLOGICAL CAUSATIVES AND APPLICATIVES



Map 30

MORPHOLOGICAL EVIDENTIALS AND ATTITUDINAL AFFIXES

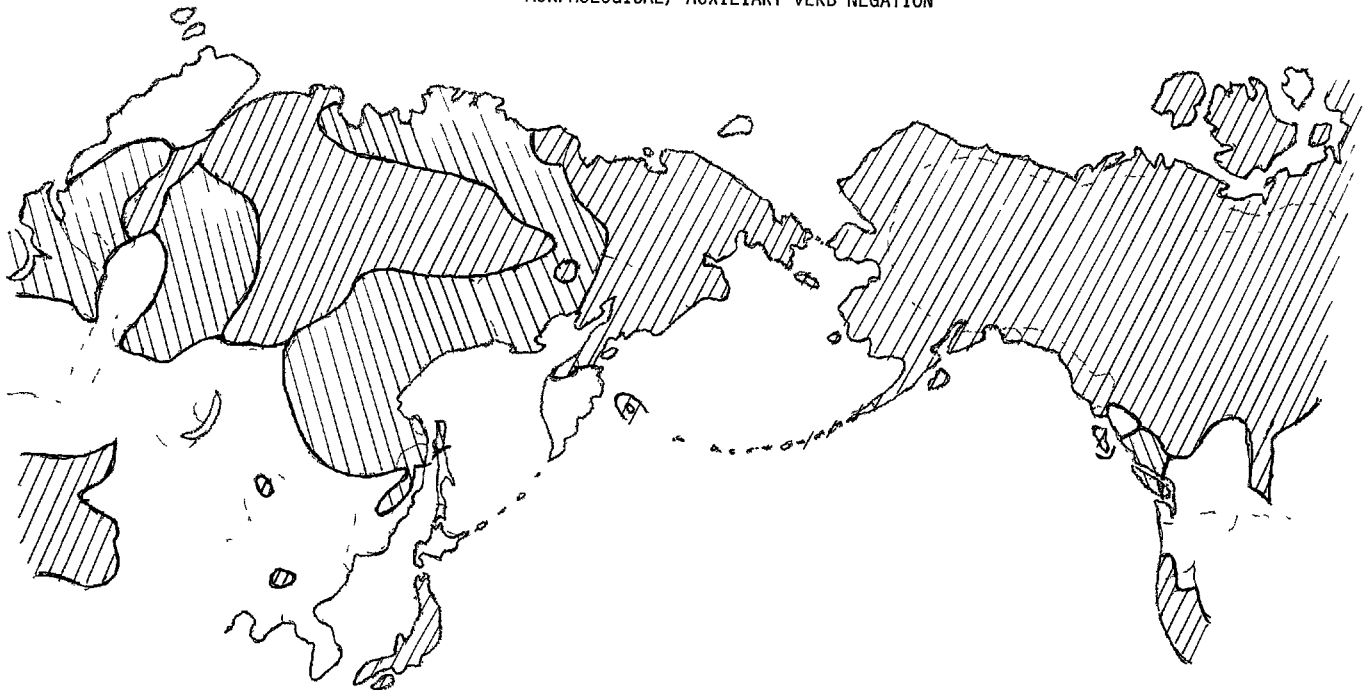


morphological evidentials (enclitic in interior Sa, Hupa At & some OP)

attitudinal affixes (proclitic in Ts)

Morphological debitives in Tu, EA, Y, Ya, Ni, CK, Al & some S at least, and morphological desideratives in Ev, Ek, Ni, EA, CK, Y, Na, Kwa, Al, Miwok CP & some Sa and S; affective consonant alternation in CK, Tl, Ni, W & some coastal Sa, OP & Ho

MORPHOLOGICAL/ AUXILIARY VERB NEGATION



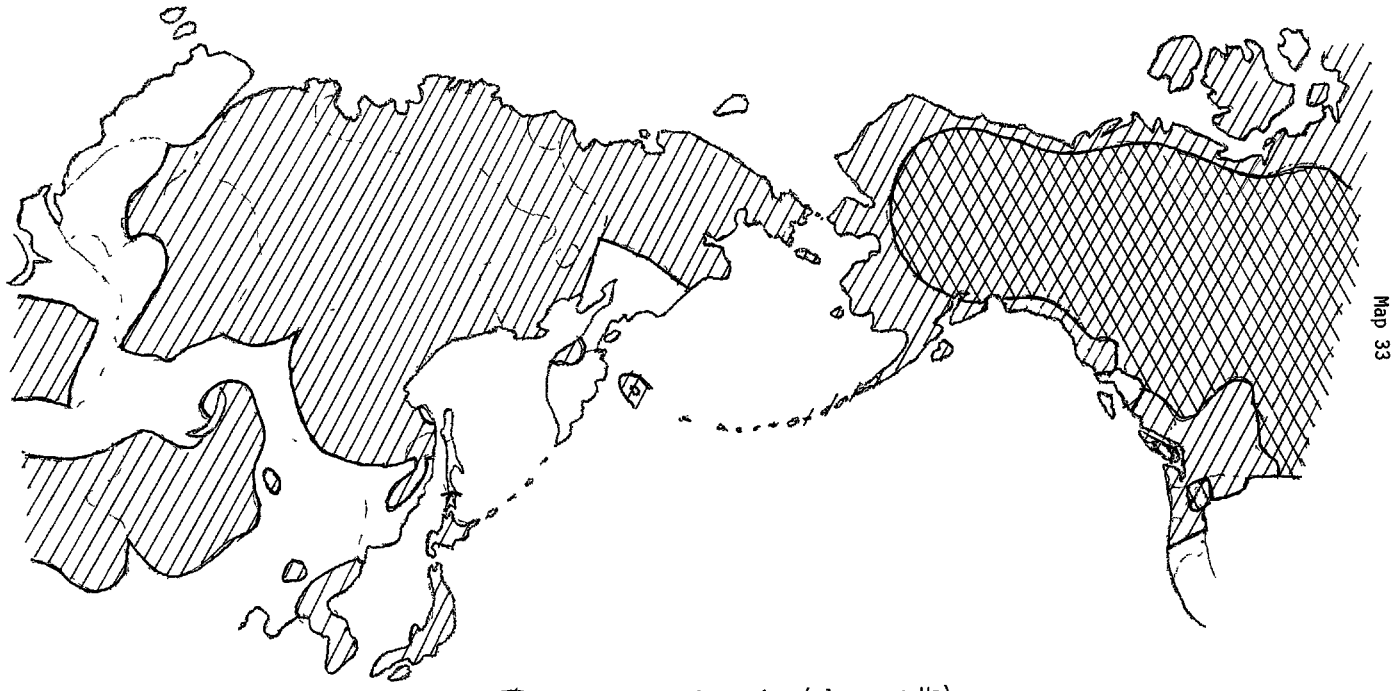
Map 32

morphological negation

negative auxiliary verb (also Pomo Ho)

Morphological negation in M with some nominalized constructions, enclitic in most At but inflectional in some NA, suffixal in H; in Ko the adverbial negative fused with auxiliary 'be'.

MORPHOLOGICAL PASSIVE/ INVERSE



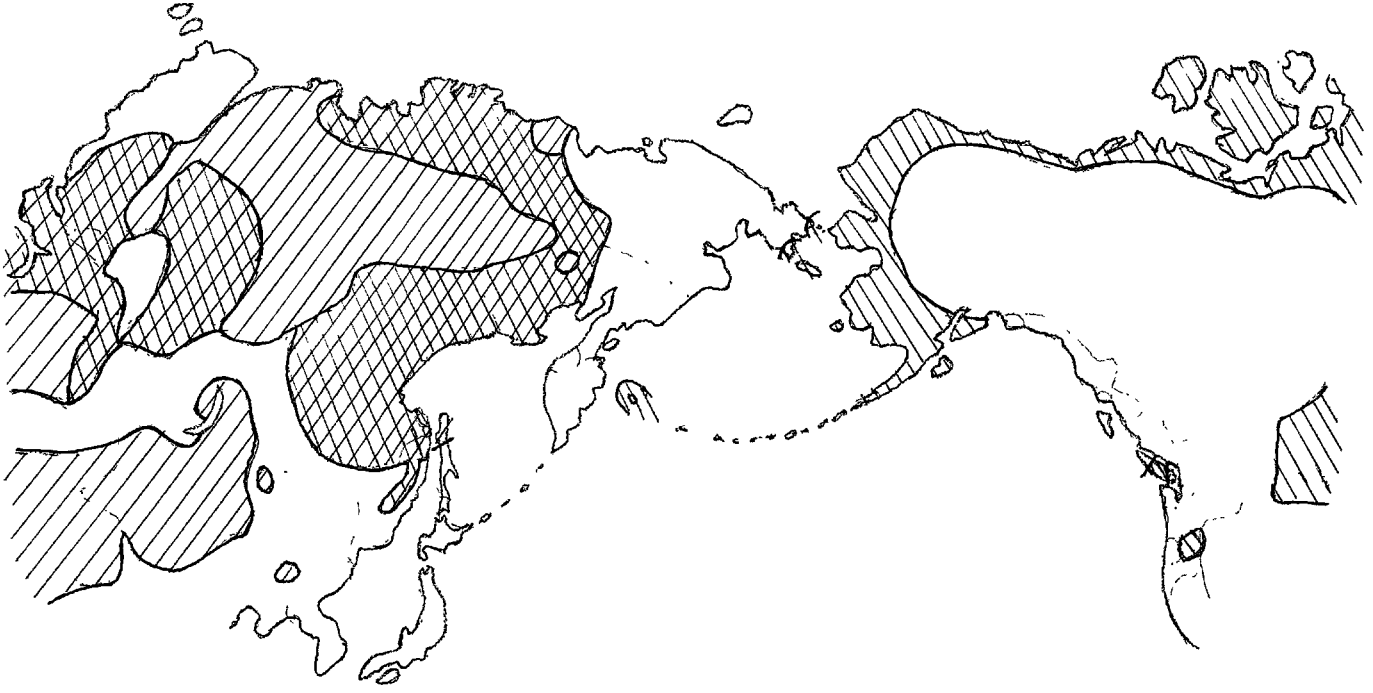
Map 33

morphological passive (also some Ho)

morphological inverse (perhaps also some Ho & Sa; traces in CK)

Indefinite subject type passive in I , Tl ,Al & Sa; obligatory 'passive' in some combinations in Sa & W; in At 'inverse' a matter of 3rd person object prefix choice on verb; northern S, Ke & Sa have a middle voice, whereas most Alt & CP have reflexive affixes (proclitic in Ts)

NON-FINITE SUBORDINATE CLAUSES



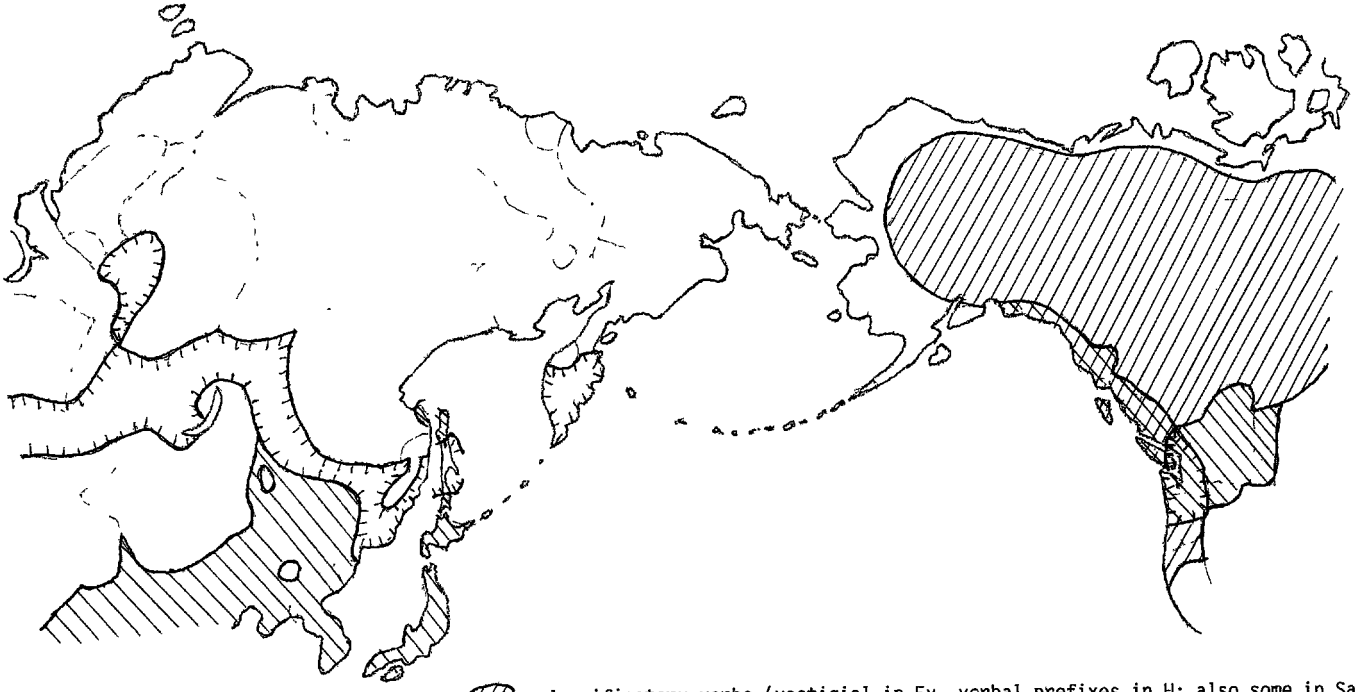
non-finite subordinate clauses usual (also some in CK)

special subordinate verb moods (also some coastal Sa)

CK & ND have subordinating particles like R, Kwa has subordinating suffixes and/or verbs, and H has postpositions on finite or nominalized verbs

Map 34

NOUN CLASSES AND CLASSIFICATORY VERBS



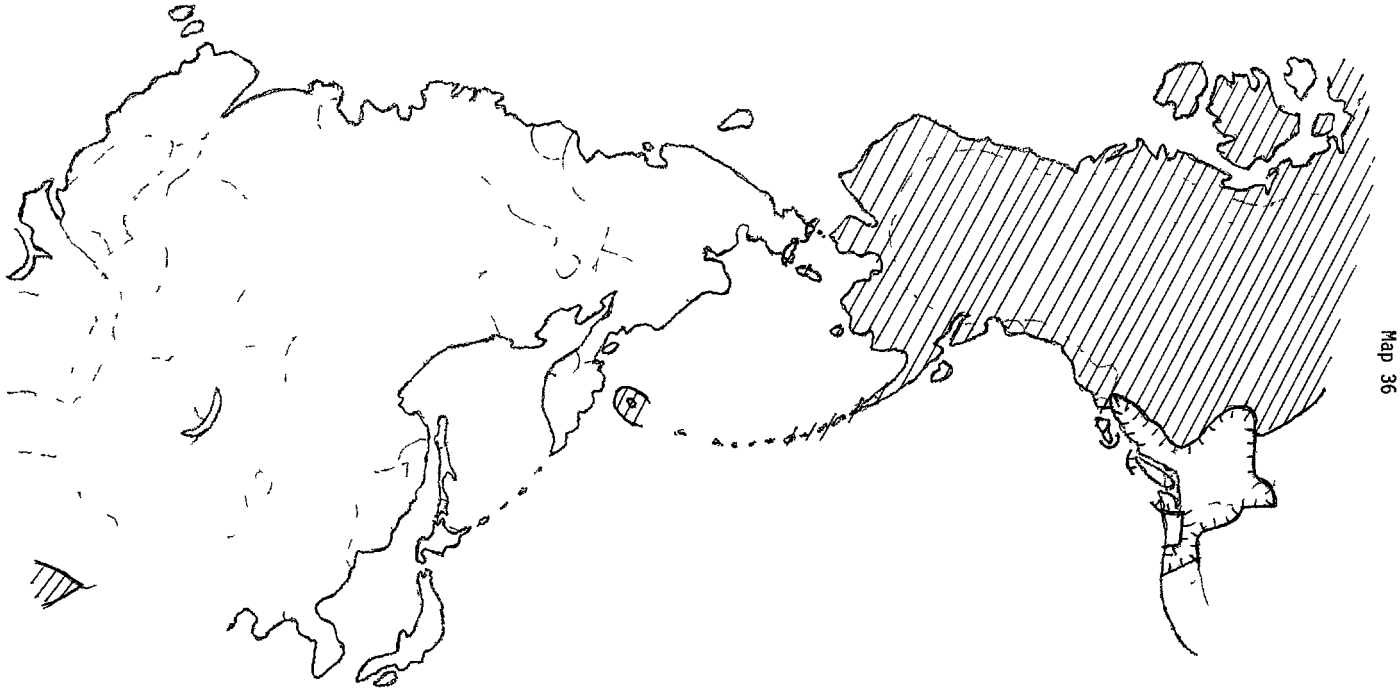
classificatory verbs (vestigial in Ey, verbal prefixes in H; also some in Sa)

numeral classifiers (also Karok Ho and Ojibwa & Ritwan Al)

noun gender systems (also Chinook OP)

Inanimate/animate classes in At, Al & Se, also in Tl, Ey & H pronouns; visible/invisible demonstratives in EA, W, H, coastal Sa, Tl, Ts & Hupa At; limited numeral classifiers in Hupa At, Blackfoot Al, some OP & interior Sa; 'collective classifiers' in Tu & M, and covert noun gender (by verb agreement) in At

NOUN PHRASE ORDER



noun head before modifier (also Coeur d'Alene Sa)

noun head before possessor

Elsewhere modifier/possessor before head usual (but variable in CK & Ut); demonstratives before head in A, ND and H; adjectives optionally following head in CK

Map 36

NUMBER AFFIXES

singulative affixes

plural and dual affixes (only the former in Sir)

plural only (limited in Y, and in some CP dual also)

Limited plural/collective marking in southern Tu, Ai, Ko, Ut, W, J, Ko, some Ho, CP & OP, also in Tl, H & AE on animate nouns only; in Sa plural marking usual but not obligatory; dual pronouns in some eastern NA & OP and most of California, in Ni 1st person only ; Shoshone Ut has dual and plural affixes obligatory only for human nouns and pronouns

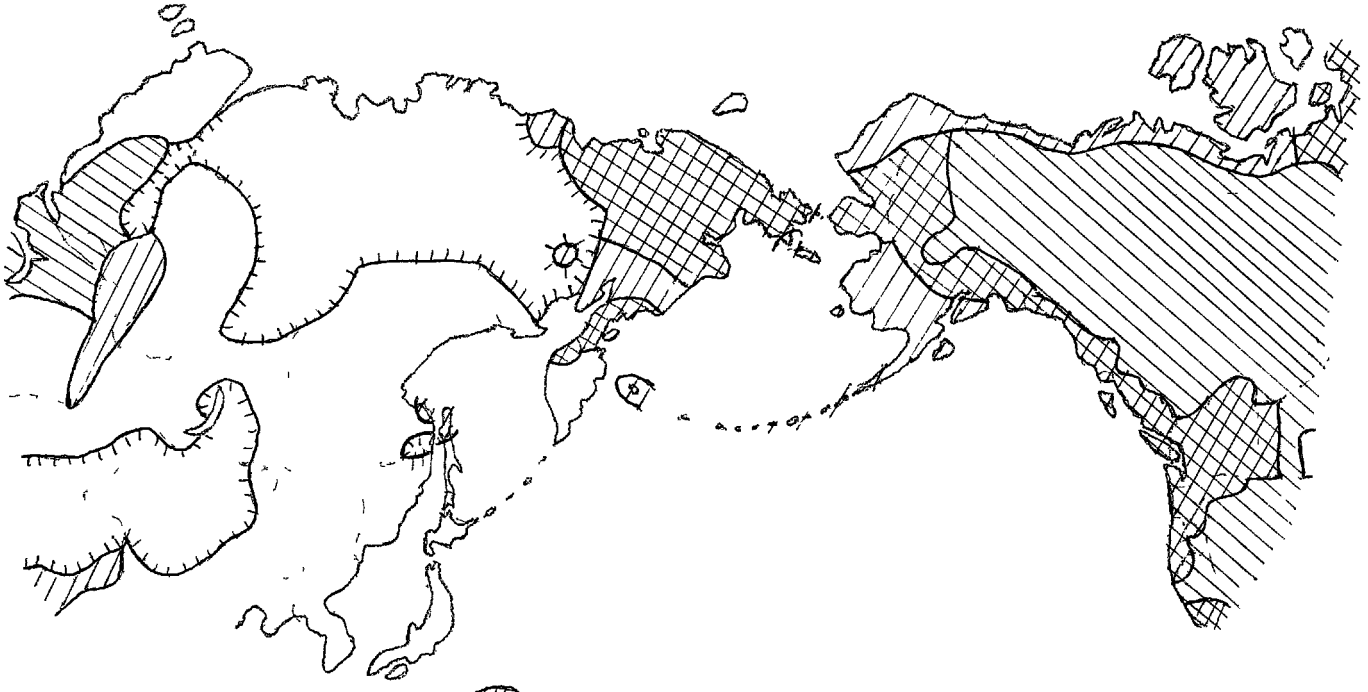
PALATAL CONSONANT SERIES

palatal consonant series (/ʃ/ & /ɟ/ at least)

In Ne, as in R, nearly all consonants have palatalized counterparts; some NA has /ʃ/ (and Kutchin At some other palatals;

Map 38

PHONEMIC /q/ AND GLOTTAL STOP



Map 39

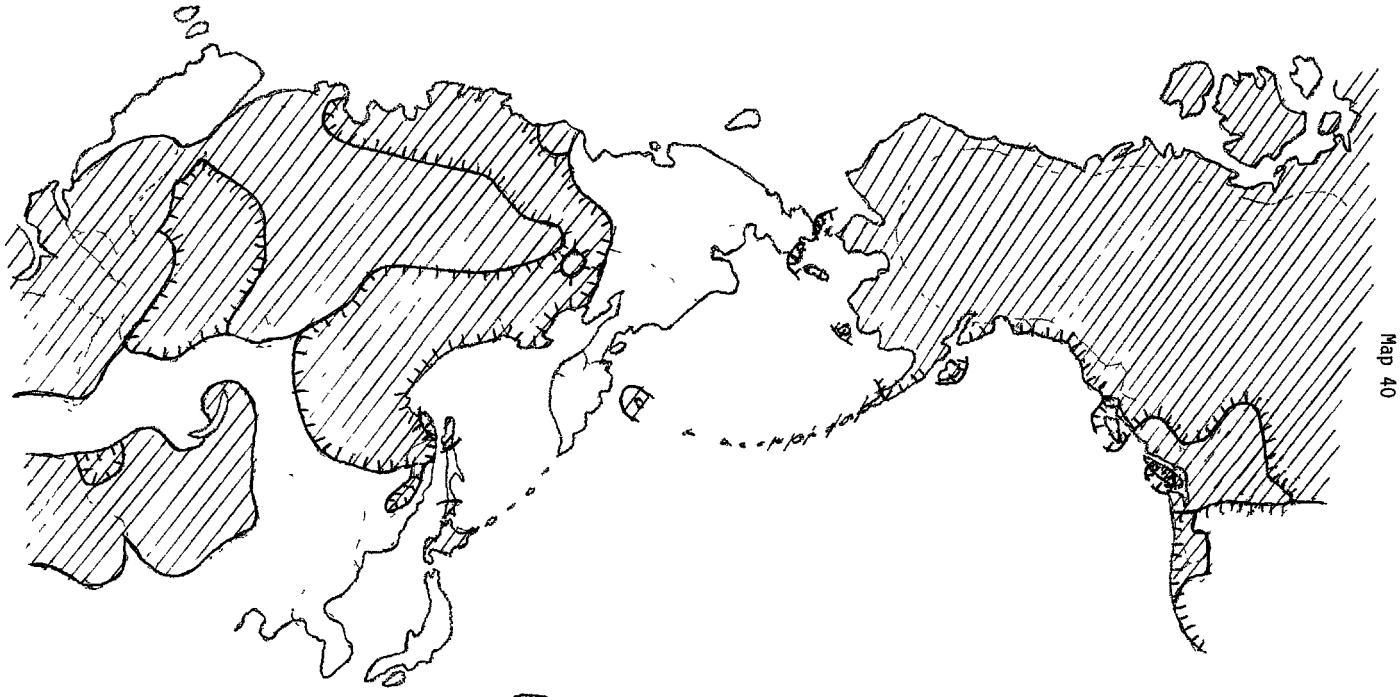
phonemic /q/ (with /X/ variant)

uvular pronunciation of /k/ as /q/ (or /X/) in back or open V environment

phonemic glottal stop (with pharyngeal allophone in C)

/q/ present in some Ut but lacking in some · OP & some CA; pharyngeal fricative in K, some Au, W, northern H and adjacent At & interior Sa; pharyngealized vowels in Tuvan T and glottalized ones in Ud (< *VkV); also pharyngealized glottal stop in northern H, Nootka W and some Au

POSSESSIVE AFFIXES



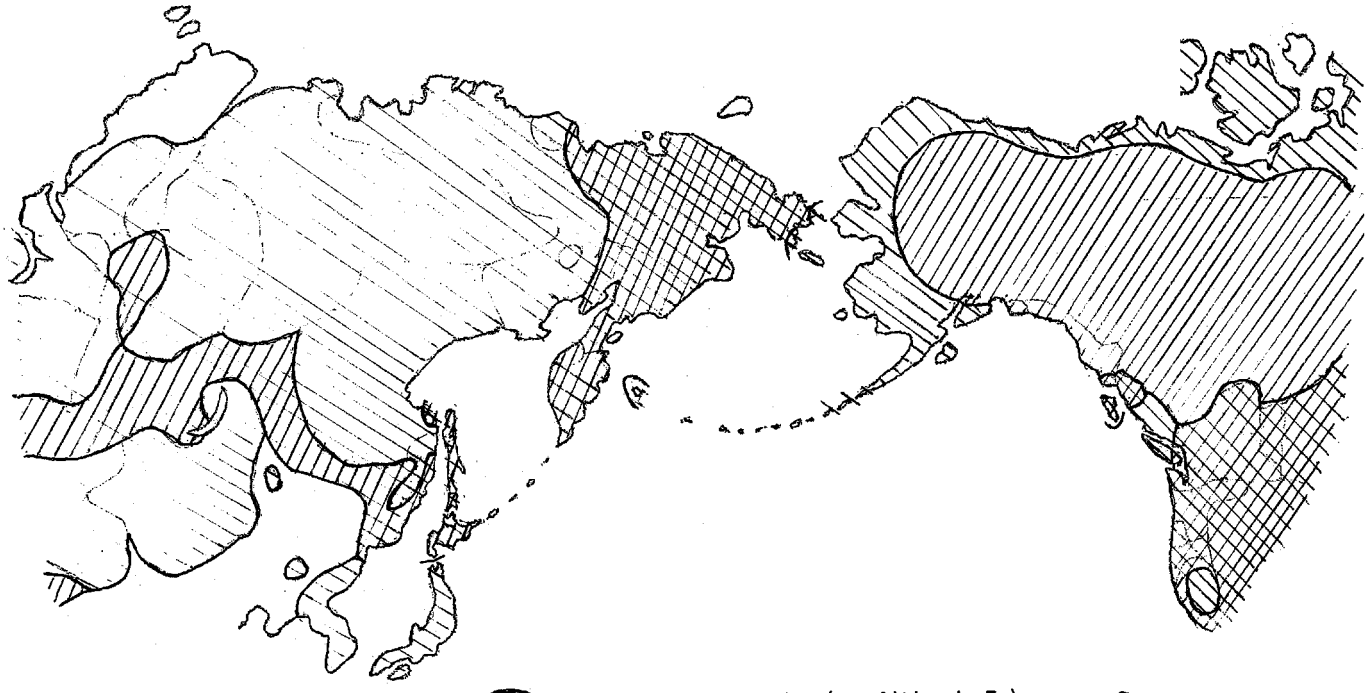
Map 40

possessive affixes (3rd person only in Y)

alienable/inalienable possession

Possessor prefixed in ND, Ku, Sa and some OP, CP & Ho, vestigial in Ey, proclitic in Tl & some Ut; poss. markers before case in T, EA & Ugric, the reverse in most Ur, also Tu & M; possessor incorporation in verb in I, W , Ku, some Al & OP

PREFIXATION/ SUFFIXATION



predominantly prefixing (proclitics in Ts)

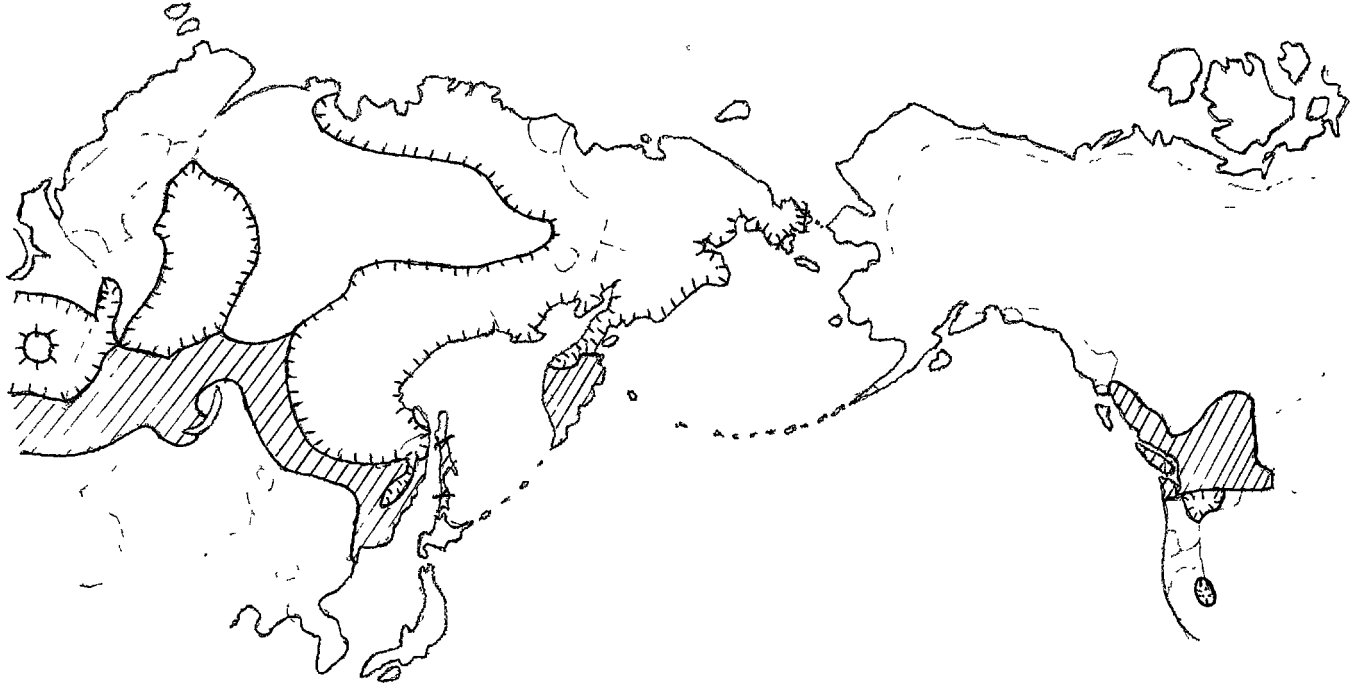
predominantly suffixing (limited prefixing too in Y)

} both = mixed

Only few prefixes in Sa; circumfixes in CK and in some Sa, infixes in Ke

Map 41

PREPOSITIONS/ POSTPOSITIONS AND LOCAL CASE



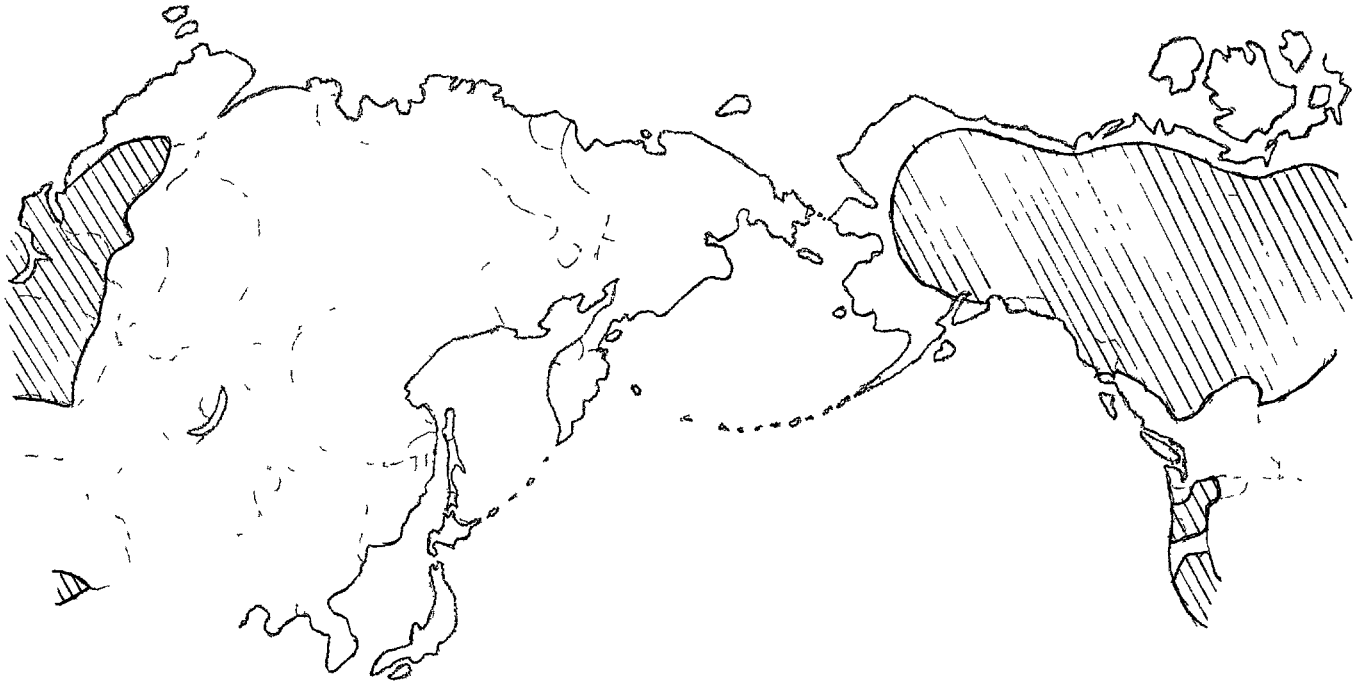
Map 42

prepositions (elsewhere postpositions, except Al, Ku & some OP & CP)

complex noun case systems (more than 4 local cases)

Local suffixes on nouns in Al, Ut, most Ho & OP and at least on directional stems in Na-Dene; prepositions verb-like in W and Sa; case systems also in T, M, Ur, R, EA, Ni & Klamath OP and all other CP

STEM-INTERNAL ABLAUT

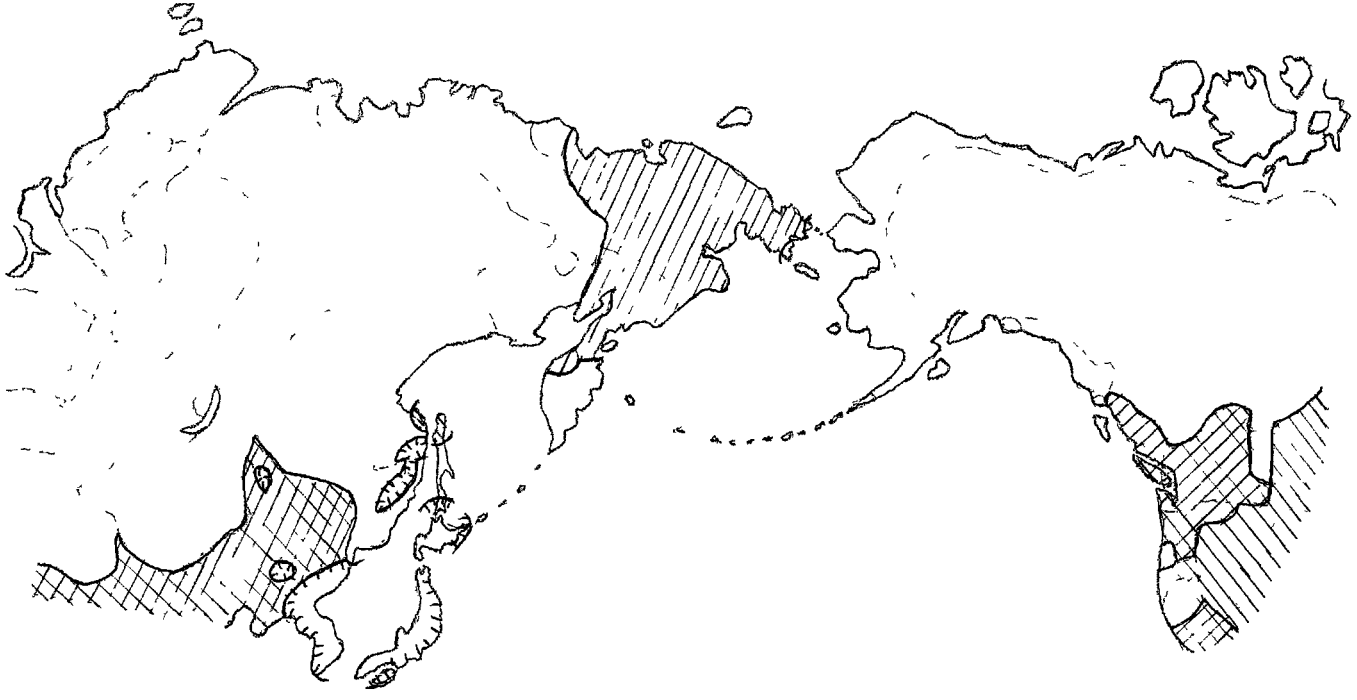


Map 43

stem-internal ablaut (vestigial in R & some coastal & Kalispel Sa)

Limited ablaut in some Al, Ke & H, and found in conjunction with reduplication in Ts, W and all Sa

STEM REDUPLICATION



Map 44

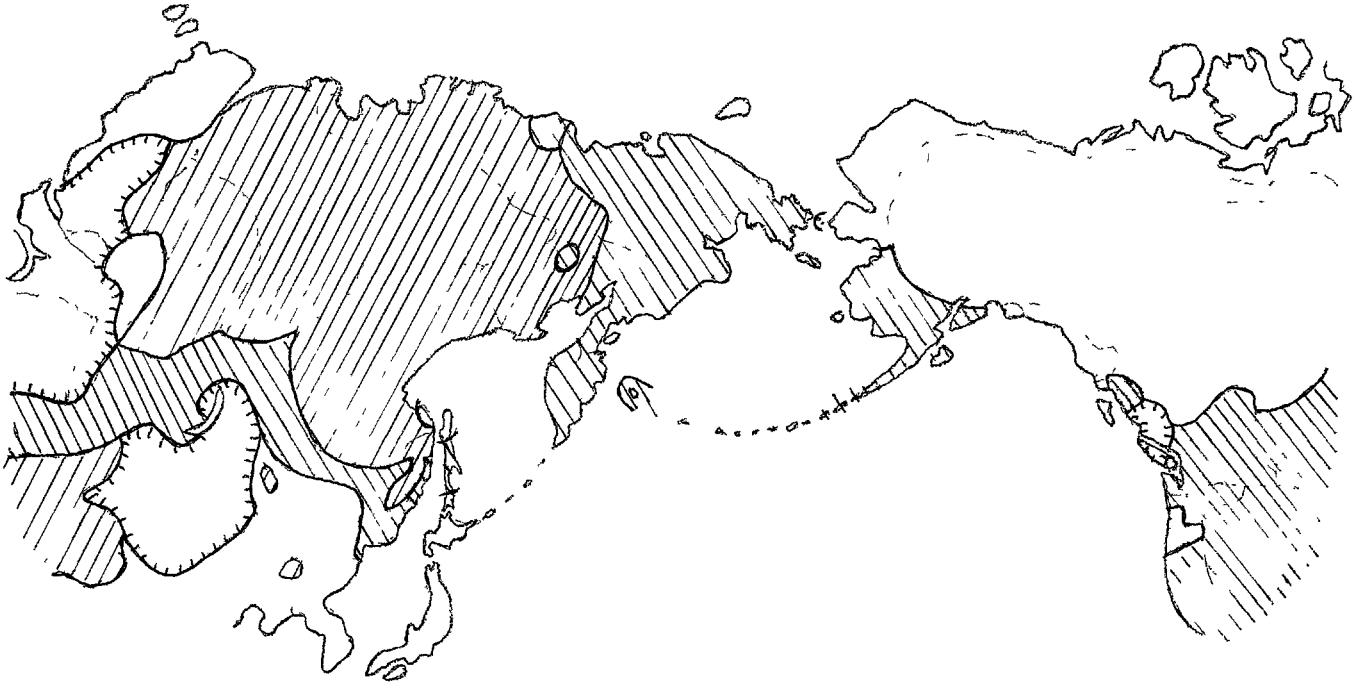
noun stem reduplication

verb stem reduplication (lacking in some Ho)

onomatopoeic reduplication (also Ch, Ni & Nootka W)

In W, Sa & some OP noun stem reduplication expresses dimunutive, but in CK singulative and in Ts plural (as also to limited degree in some Ut,J & Ai); reduplication of some other adverbials in Na & Ud

STRESS



Map 45

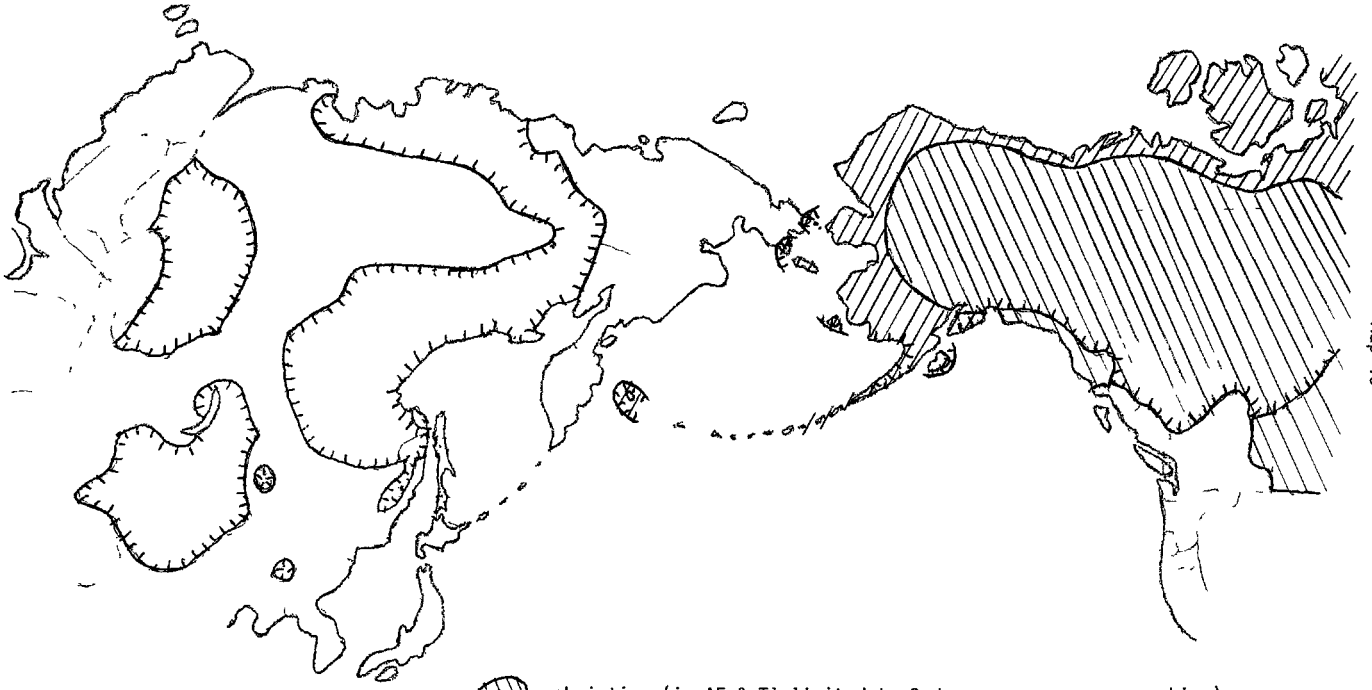
final syllable main stress

first syllable main stress (but some variation in northern S)

variable word stress (in CK, most coastal Sa & Yokuts CP usually penultimate)

In Tu there is usually 'musical' (raised pitch) accent on the final and secondary 'dynamic' stress on the initial syllable, but in Ev usually penultimate unless the final vowel long; tendency to final stress in Y

SWITCH REFERENCE AND REFLEXIVE POSSESSION



Map 46

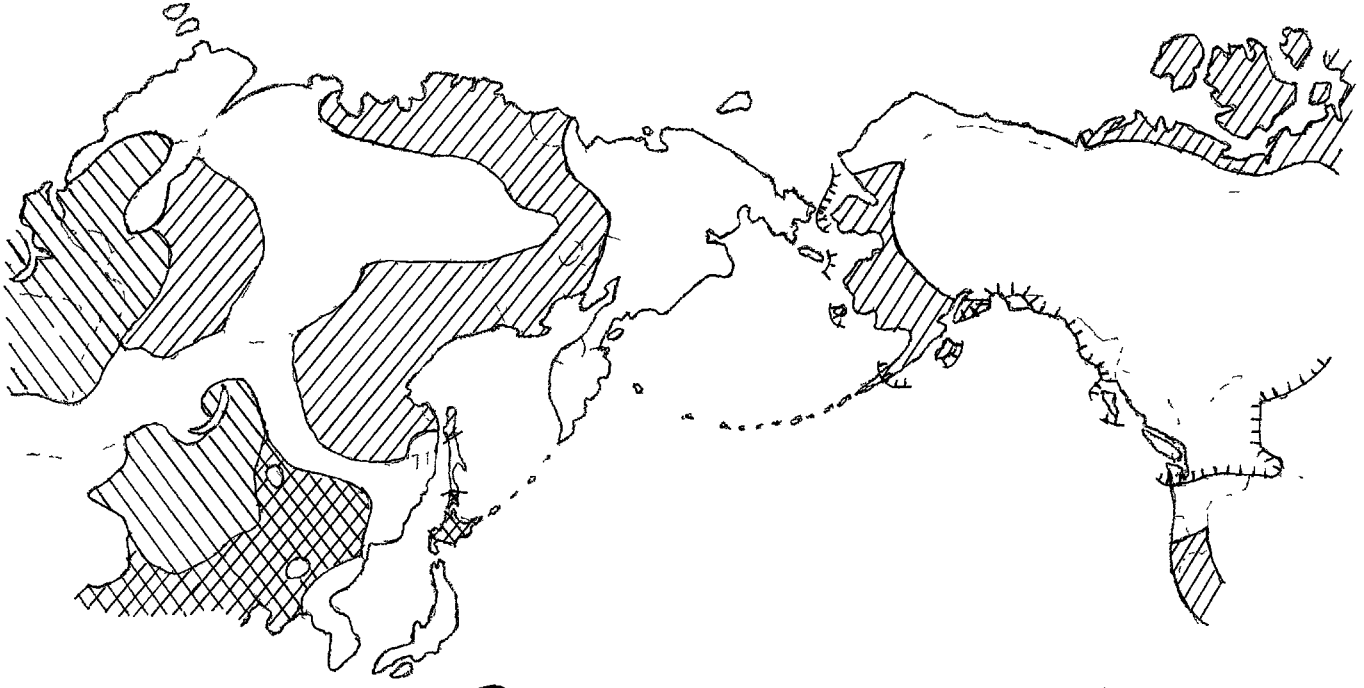
obviation (in AE & Tl limited to 3rd person possessor marking)

reflexive type switch reference (3rd person)

reflexive/plain 3rd person possessive affixes

Tl has 'salient' v. 'recessive' 3rd person markers rather; same/different subject gerunds in Ni, Y & OU (as in EA); other kinds of switch reference in H, CP, some Ho and most Ut in subordinate clauses; M, H, Ni, Tu & Hupa At have all-person reflexive affixes/clitics (independent in Ke & R)

TENSE CONFLATION IN SIMPLE INDICATIVE



complex aspect predominates over tense (also some Ut)

past and present conflated

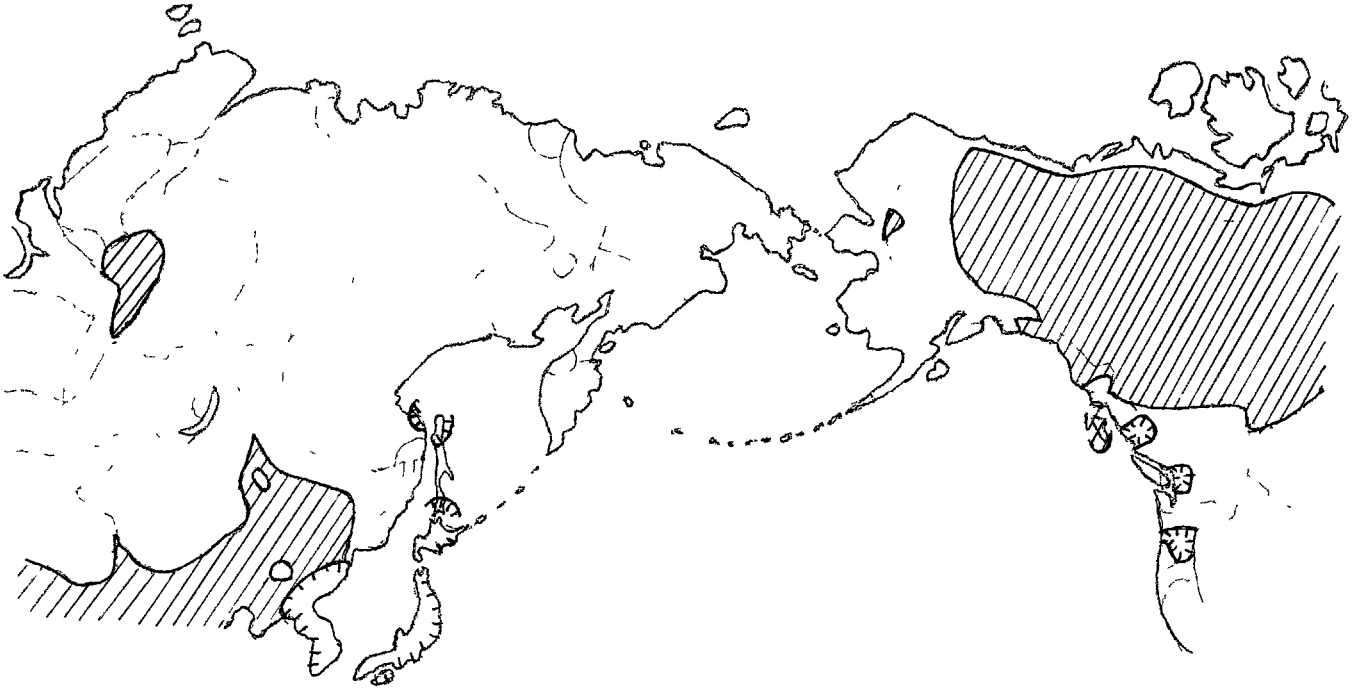
present and future conflated

} both = all 3 conflated (also some CP)

In Ne present also used for recent past; many aspectual suffixes also in Tu, Ni & other EA

Map 47

TONES



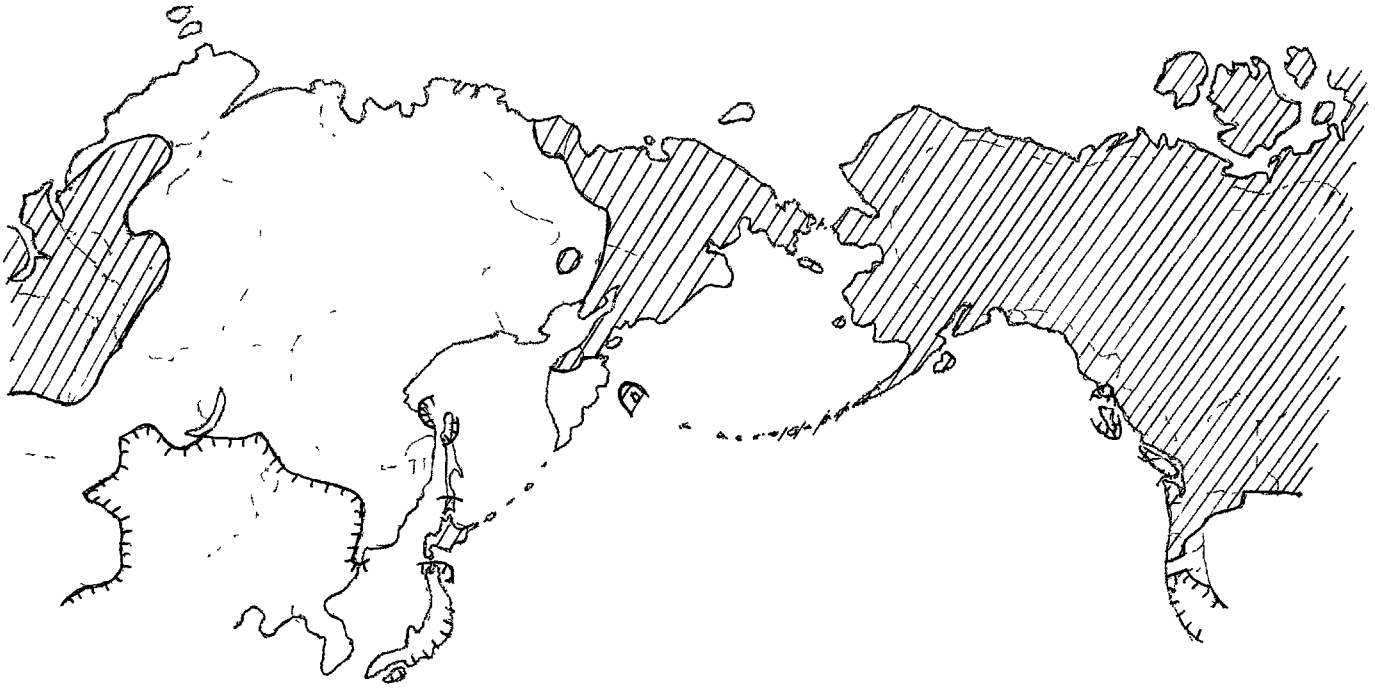
Map 48

tone languages

pitch accent (also Karok Ho, Quileute, Bella Coola & some other coastal Sa)

Mainland H has pitch accent; falling v. plain/interrupted vowels in Ts; no tone in Tongass Tl dialect; pitch correlates of stress in Chugach AY and perhaps some Ut

TRANSITIVE/ INTRANSITIVE VERBAL PARADIGMS

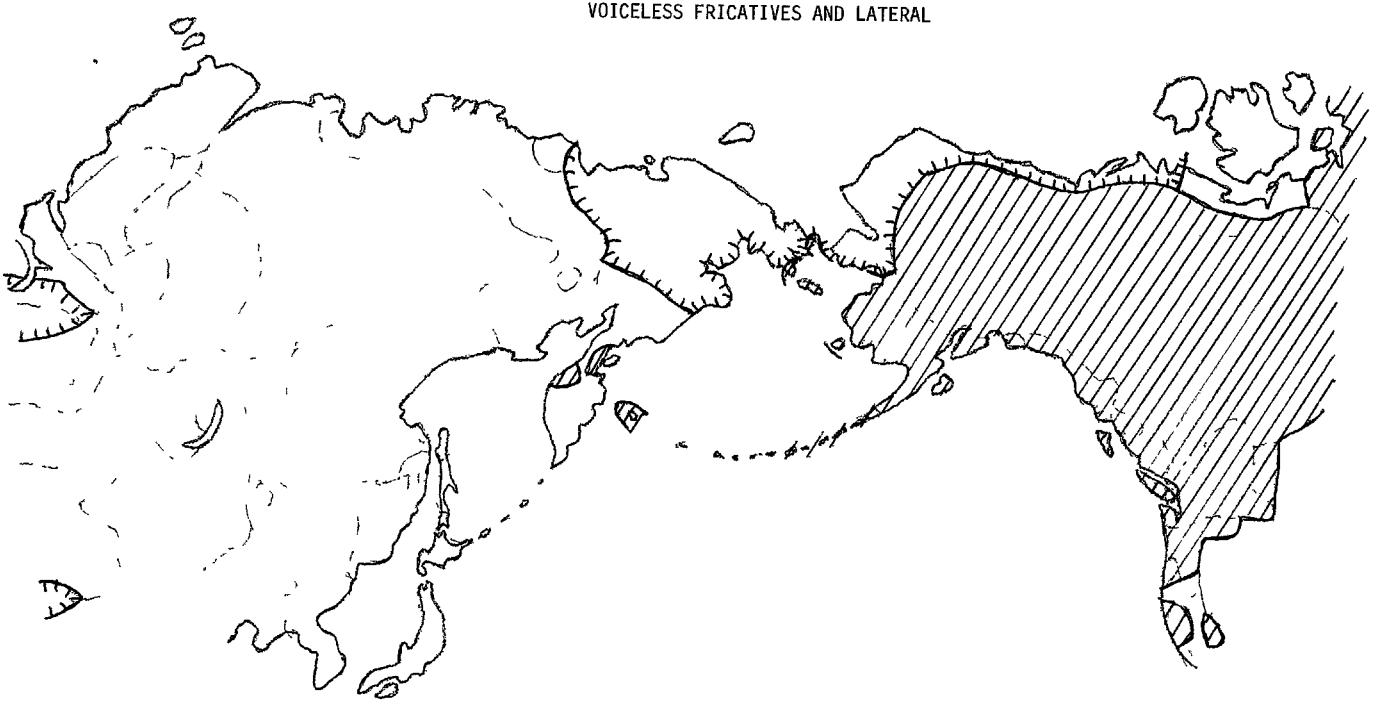


transitive paradigms (also Yana & Atsugewi Ho)

no subject/object marking on verbs (except some non-indicative forms in Ni)

Chinook OP also marks indirect object on verb; subject/object markers clitic in Ts & OP other than Chinook (and object usually proclitic in Tl); clitic (pronoun) object attaches to preceding verb if no NP object in Kwa; new subject clitics/ suffixes in some M, but still independent pronouns in some CP, Klamath OP & Pomo Ho, enclitic in some Sa, proclitic in H & some Ut

VOICELESS FRICATIVES AND LATERAL



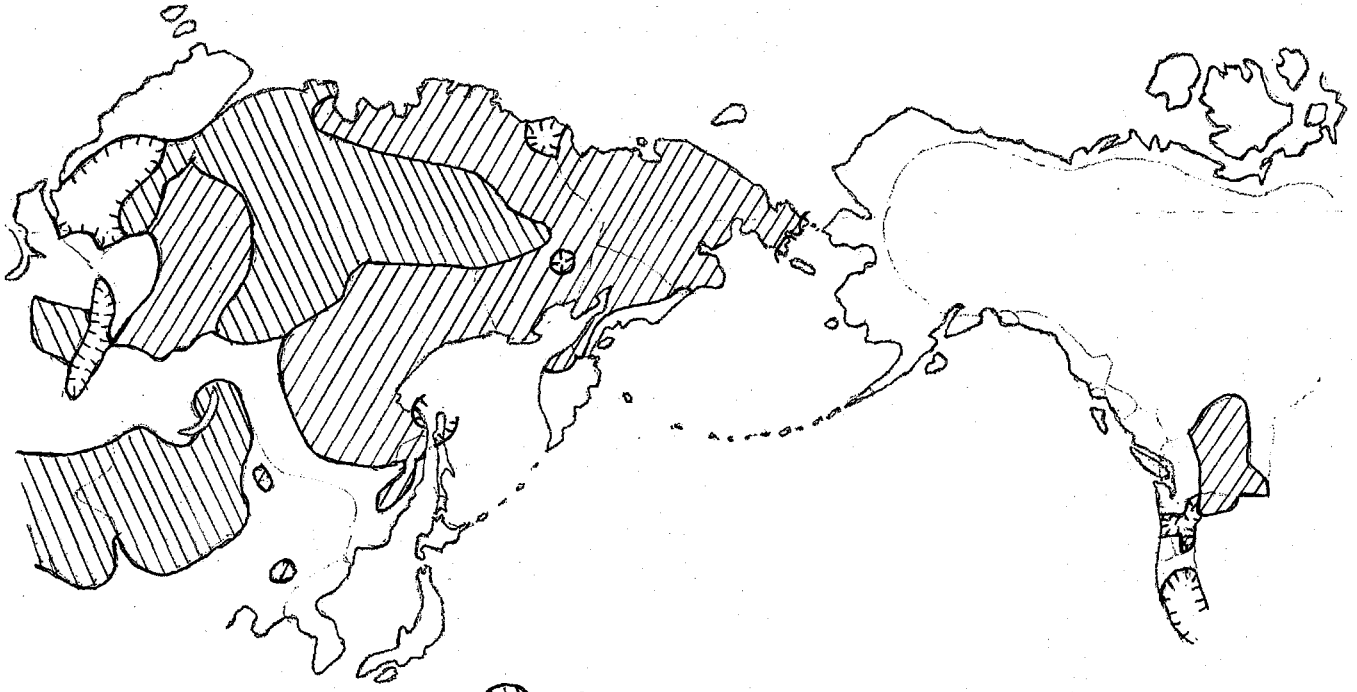
voiceless fricatives and /ɬ/

/ɬ/ only

Some OU, Tundra Ne, B & Khalkha M have /x/ (from */k/); voiceless fricatives also in Ut, Al, Ma, Na, Ch, Ni, R, Copper & some NAI In; in Chinook OP, Squamish Sa & most CP there is no /ɬ/ and only one voiceless fricative; C, K, Ek & Ev have voiced fricatives only; voiceless nasals in A, Yu & adjacent NA, also some Ut ; Ya has [X] allophone

Map 50

VOWEL HARMONY



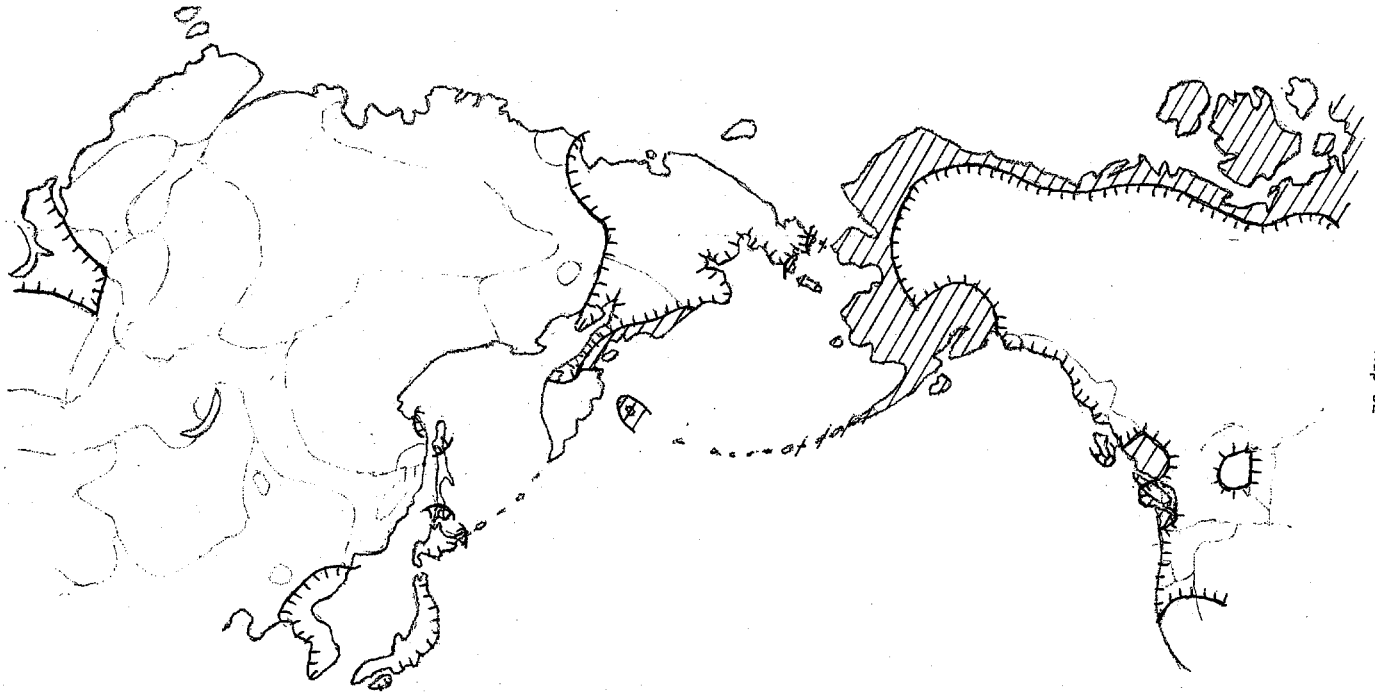
palatal harmony

root-retraction harmony (limited in I, Ma & Wiyot Ritwan)

marginal vowel harmony (traces also in other Ur, Ko, J & some Ho)

Labial harmony superimposed on palatal type in most T, vestigially also M; palatal harmony disturbed in M and vestigial in Uygur T; root-retraction type analogue also in Chilcotin At

VOWEL SYSTEMS



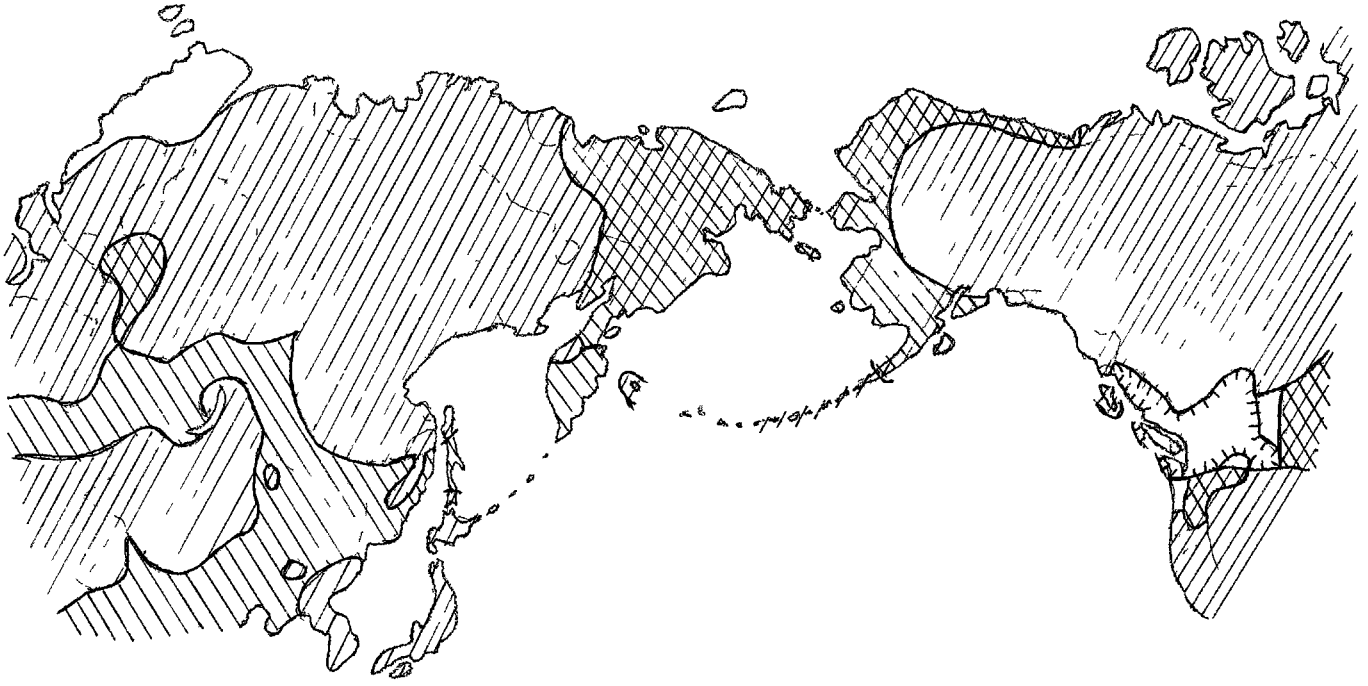
simple vowel systems (3 full vowels or less)

4 to 5 full vowels

Distinct front/back allophones of all full vowels in Ne; in Bella Coola Sa only one full vowel

Map 52

WORD ORDER



predominantly SOV
predominantly SVO
} both = mixed or free (VO neutral in Al)

predominantly VSO (also Yana Ho)

Chinook, Coos & Siuslaw OP, Kutenai, and Coeur d'Alene Sa are VOS; in northern Ch SOV is common; focus position before verb in T & Ur; H has OSV with pronouns; Kalapuya OP has SVO

Map 53

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