Yeniseic substrates and typological accommodation in central Siberia

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1 Introduction

When Russians entered Siberia in the late 16th century they found most of the area inhabited by reindeer herders or nomadic pastoralists speaking Uralic, Turkic, Mongolic, and Tungusic languages. Western Siberia contained Khanty (Ostyak) and Mansi (Vogul) dialects belonging to the Ugrian subgroup of Uralic. In the northeast were Nenets, Enets, and Nganasan tribes speaking Uralic languages of the Samoyedic branch. Southern Samoyedic peoples included the Selkup (Ostyak-Samoyed), as well as the now vanished Mator, Karagas, and Koibal north of the Altai-Sayan Mountains. Turkic speakers, whose modern descendants are the Khakas, Altai, Ös (Chulym), Tuvan, and Tofalar – occupied the lion's share of south Siberia's forest-steppe zone. Mongolic speakers (Halh and Buryad) lived to the south and east. Tungusic tribes speaking western dialects of Evenki had recently begun moving into central Siberia from the east. The predominant ethnolinguistic presence across North Asia was pastoral nomad groups speaking suffixal-agglutinating languages. The distribution of languages in central Siberia circa 1600 is known from tsarist *yasak* (fur tax collection) records (Dolgikh 1960).

(1) *Language map of central Siberia in the 1600s*

Amid the more familiar linguistic groups, the middle Yenisei and its tributaries was home to scattered bands of hunter-gatherer-fishers whose only domesticate was the dog. These groups, knows as Yeniseians, spoke languages genetically unrelated to the surrounding families. Yeniseic (Yeniseian) languages also differs typologically in having a prefixing verb morphology, pronominal possessive prefixes, phonemic distinctions in prosody, and a basic vocabulary stock without analog elsewhere in Northern Eurasia. The languages of central and western Siberia's animal breeders, by contrast, conform to a well-known typological profile. All of them are non-tonal and have consistently suffixing nominal and verbal inflectional morphology.

This article surveys the sociolinguistic interaction between Yeniseic hunter-gatherers and the pastoralists who eventually supplanted them across most of central Siberia. Although a scattering of Yeniseic substrate elements appear across a vast area of Inner Eurasia, the pastoral peoples borrow none of the prototypical Yeniseic typological traits. Language contact also left Yeniseic vocabulary little affected. However, Yeniseic grammatical structure was affected rather significantly. Modern Ket provides the best example. It contains few loan words yet has evolved a unique partial mimicry of originally alien morphological traits from neighboring families. The present article argues

that long-term bilingualism on the part of Yeniseic speakers led to this interesting typological hybridization. The Uralic, Turkic, and Tungusic speakers of the region, on the other hand, were rarely conversant in a Yeniseic language. Even where their ancestors shifted from Yeniseic, the shift occurred in a way that yielded little substrate influence. Samoyedic and South Siberian Turkic acquired virtually no Yeniseic structural features, and speakers of these languages borrowed only a modest number of lexical items from their hunter-gatherer neighbors.

This article explains how and why inter-ethnic contact in central Siberia yielded this particular set of linguistic outcomes. It examines in detail the typological accommodation that Yeniseic morphological structure underwent due to prolonged exposure to the patterns of suffixal agglutination common to other languages of central Siberia. Yeniseic-internal comparisons show what typological traits were typical of the family before this accommodation occurred. External comparisons to Na-Dene (Athabaskan-Eyak-Tlingit) family of North America – with which Yeniseic shares a genetic link – are also useful in helping to determine the original typological profile inherited by Proto-Yeniseic, the language ancestral to Ket and its extinct sisters.

2. Yeniseic: prehistoric distribution and internal subgrouping

Substrate river names reveal that Yeniseic speakers once occupied a far larger portion of Inner Eurasia than when the Russian encountered them in the 17th century. The map in (2), following Maloletko (2002) and Werner (2005), shows the approximate distribution of Siberian river names containing originally Yeniseic words for 'river'. The chart on the left identifies, where possible, the language from which each element appears to have originated.

(2) *Substrate hydronyms containing the Yeniseic word for 'river'*

The diversity of Yeniseic substrate river names strongly suggests that some primary branches vanished unrecorded. Hydronyms containing *tis, tyš, tas, taš* – the geographically most prominent of which is the Irtysh River itself – indicates the existence of an additional primary node of Yeniseic. River names containing *zis, zaš, zes* indicate yet another. The eastern Sayan region just north of present-day Tuva and western Mongolia contains greatest diversity of substrate river names. It is the only compact area where every major variant of Yeniseic 'river' is represented. Based on this evidence, it is likely this portion of the upper Yenisei watershed approximates the original location of the Yeniseic daughter branches recognizable from toponymic evidence.

The lone survivor of this erstwhile diversity is Ket, the family's northernmost member, now spoken on the fringe of the original Yeniseic range. The ethnonym "Ket" derives from *kɛˀt* 'man, person, human being'. Before the 1930s Ket was known as 'Yenisei Ostyak', from Russian *ostʲak*, possibly originating from Khanty *as-jax* 'big river people' (cf. Georg 2006:13). The Ket refer to themselves as *ɔstúɣan* 'Ostyaks' when speaking Ket. Most of the 1,200 ethnic Ket live today in small villages on the Yenisei and its tributaries in the Turukhansk District of Krasnoyarsk Province or in the Evenki District's Baikit Region. At present, fewer than 200 people speak the language fluently. Few if any children of the past two generations have acquired genuine fluency. Given this

pace of replacement by Russian, Ket must be regarded as highly endangered (Krivonogov 1998, 2003). Several local elementary schools have taught it as a second language since the late 1980s using materials developed by linguist Heinrich Werner in collaboration with native pedagogues. Based on fairly minor phonetic and lexical differences, Ket is divided into Southern (SK), Central (CK), and Northern (NK) dialects. The largest concentration of Ket people lives in Kellog on the Yelogui River in the Southern Ket zone.

As the last true hunter-gatherer-fishers of landlocked northern Eurasia (the sole domesticate was a type of Samoyed dog), the Ket and their extinct relatives should interest historians and anthropologists as much as their languages have intrigued linguists. Before Soviet collectivization efforts in the mid 1930s, most Ket lived in isolated family groups who traveled great distances on foot between forest hunting trails in winter and fishing encampments near the Yenisei or its tributaries in spring and summer (Alekseenko 1967, 2005; Vajda 2007).

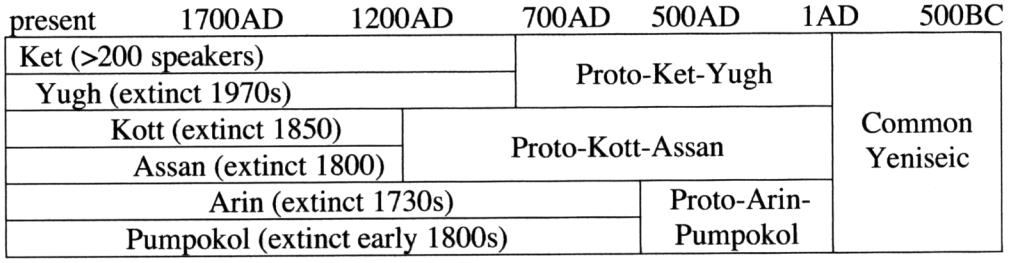
Of the extinct Yeniseic tongues, grammatical descriptions exist only of Yugh, which survived into the 1970s (Werner 1997b) and Kott, which disappeared by the mid-1800s (Castrén 1858; Verner 1990a; Werner 1997a). The remaining documented languages – Assan (extinct by 1800), Pumpokol (extinct by 1800), and Arin (extinct by 1730) – are known only from word lists compiled by 18th century travelers (see Werner (2005) for a complete inventory). Other groups – Buklin, Baikot, Yarin, Yastin – are identifiable as Yeniseic-speaking from 17th-century tsarist *yasak* records, though little remains of their languages except a few proper names (Dolgikh 1960). Yugh is similar enough to Ket that most Soviet linguists regarded the two as dialects, referring to Yugh as "Sym Ket" and the three downriver Ket dialects as "Imbat Ket". Ket and Yugh comprise the family's northern branch. Kott and Assan, the family's southeastern branch, are even more closely related (Verner 1990b; Werner 2005). Recordings of Kott by early explorers and linguists suggest the existence of at least two distinct Kott dialects (Verner 1990a:45–51). Arin and Pumpokol – the family's third, southwestern branch – separated longer ago than members of the other two branches.

The documented Yeniseic languages appear related at a time depth of at least 2,000 years, though the initial breakup of Common Yeniseic may have occurred even earlier. It is conceivable that the first dispersals of Yeniseic speakers occurred in the Scythian Era (700-200BC), with some groups entering western Siberia from the Altai-Sayan region. The northward movement of speakers ancestral to the Ket/Yugh branch probably began as a response to Turkic intrusion into this area. A Ket legend tells of being pushed farther north up the Yenisei by *kilikidze* (almost certainly the Kirghiz Turks). The same legend relates that "much earlier" a people called the *tɯsta* (Anuchin 1914:1) drove the Ket northward over "high mountains." This legend may date back to a time before Common Yeniseic divided into dialects. Unfortunately, the *tɯsta* remain unidentified and there is no plausible time frame for this migration. It is not possible to firmly date the original breakup of Common Yeniseic.

Yeniseic-speaking groups cannot even be placed in the historical record before tsarist rule at the close of the 16th century. Conceivably, the Dingling hunter-gatherer tribes along China's northern border in the 2nd millennium BC represent the first historically mentioned linguistic forbearers of the Ket (cf. Ket *dɛˀŋ* 'people'). Suggestions that at least some ethnic elements among the Xiong-nu (Hsiung-nu) spoke a Yeniseic tongue are

difficult to substantiate due to the paucity of data. Fewer than twenty Xiong-nu words are known to have been recorded in Chinese texts, with creative guesswork required to deduce their original pronunciation; see Vovin (2000, 2002), however, for a well-reasoned identification of several of these as Yeniseic. The general absence of Yeniseic grammatical or phonological influence on known Eurasian languages, a point elaborated in Section 3 below, would seem to argue against the enormously influential Xiong-nu or later Huns being primarily speakers of Yeniseic. It is more likely that the first Asian pastoralists spoke some sort of suffixal-agglutinating language(s) that played a major role in helping establish this typological profile across Inner Asia.

(3) *Family-internal branching and estimated time depth*



Phonological comparisons of Yeniseic core vocabulary support the division of the family's documented languages into three primary nodes, a subgrouping first proposed by Werner (cf. Verner 1990b). The cognates in (4) reflect Proto-Yeniseic forms reconstructed in the rightmost column.

(4) *Yeniseic cognate sets*

	Ket/Yugh				Kott/Assan		Arin/Pumpokol		< *PY
	SK +	NK +	CK +	Yugh /	Kott +	Assan /	Arin +	Pumpokol	
larch	*sɛˀs*	*sɛˀs*	*šɛˀš*	*sɛˀs*	*šet*	*čet*	*čit*	*tag*	< **čɛˀç*
river	*sēˑs*	*sēˑs*	*šēˑš*	*sēs*	*šet*	*šet*	*sat*	*tat*	< **cēˑc*
stone	*tʌˀs*	*tʌˀs*	*tʌˀš*	*čʌˀs*	*šiš*	*šiš*	*kes*	*kit*	< **cʰɛˀs*
finger	*tʌˀq*	*tʌˀq*	*tʌˀq*	*tʌˀχ*	*tʰoχ*	*?*	*intoto*	*tok*	< **tʰɛˀq*
resin	*đīˑk*	*đīˑk*	*đīˑk*	*dʲīk*	*čik*	*?*	*?*	*?*	< **čīˑk*
wolf	*qūˑt*	*qūˑti*	*qūˑtə*	*χūˑt*	*(boru < Turkic)*		*qut*	*xotu*	< **qʷīˑtʰi*
winter	*kɤ̄ˑt*	*kɤ̄ˑti*	*kɤ̄ˑte*	*kɤ̄ˑt*	*keːtʰi*	*?*	*lot*	*lete*	< **kʷeˑtʰi*
light	*kʌˀn*	*kʌˀn*	*kʌˀn*	*kʌˀn*	*kin*	*?*	*lum*	*?*	< **kʷɛˀn*
person	*kɛˀd*	*kɛˀd*	*kɛˀd*	*kɛˀtʲ*	*hit*	*het*	*kit*	*kit*	< **kɛˀt*
two	*ūˑn*	*ūˑn*	*ūˑn*	*ūn*	*in*	*in*	*kin*	*hin*	< **kʰīˑn*
water	*ūˑl*	*ūˑl*	*ūˑl*	*ūr*	*ul*	*ul*	*kul*	*ul*	< **kʰul*
birch	*ùs*	*ùːse*	*ùːsə*	*ùːʰs*	*uča*	*uuča*	*kus*	*uta*	< **kʰuχʂa*
snowsled	*súùl*	*súùl*	*šúùl*	*sɔ́ùl*	*čogar*	*čɛgar*	*šal*	*tsɛl*	< **tseh^{w}əl*

The only extant documentation of Kott, Assan, Arin, and Pumpokol dates from the 18th and 19th centuries and likely omits key phonetic details such as back unrounded vowels and tones. The first accurate recordings of Ket/Yugh phonemic prosody were first made

only in the late 1960s, beginning with the pioneering work of Heinrich Werner, over a century after the first published grammar appeared (cf. Vajda 2002).

Modern Ket and Yugh contain four phonemic tonal contours: high, laryngealized, rising/falling, and falling. Following Vajda (2002, 2004), a glottal stop transcribes laryngealized tone, and a macron transcribes high tone, with a raised triangular dot added to indicate the half-length that accompanies this tone in all Ket words as well as Yugh words of this type that correlate with second-syllable echo vowels in Proto-Yeniseic. High tone occurs in 'river', 'resin', 'wolf', 'winter', 'two'. Laryngealized tone appears in 'larch', 'stone', 'finger', 'light', and 'person'. Werner (Verner 1990b) makes a convincing case that systematic peculiarities in the pre-modern transcription of Kott, Assan, Arin, and Pumpokol indicate the presence of high and laryngealized tones in these languages, as well. The high vs. laryngealized contrast appears to date back to Proto-Yeniseic.

Falling tone (Ket/Yugh words for 'birch') is connected with the loss of a fricative segment in the second part of the word. In Yugh this element remains as pharyngealization of the second mora of the nucleus: *ù:^{h}s* 'birch'[1]. It is unclear whether Pumpokol, Kott, and Assan had falling tone; if they did, then it too existed already in Common Yeniseic. The final vowels in words such as 'wolf', 'winter', 'birch' may derive from a Pre-Proto-Yeniseic rule that added an excrescent vowel after coda clusters and affricates (PY *t^{h} < PPY*č)[2]. These vowels later dropped in some languages (Southern Ket, Yugh, Arin) but were retained in others (Northern and Central Ket, Pumpokol, Kott-Assan). Rising-falling tone monosyllables are a Ket/Yugh innovation deriving from elision of an intervocalic consonant (cf. cognates for 'snow sled'). This tonal signature is also present across the two separate vocalic nuclei of most disyllabic roots (left unmarked in the present article).

The divergence of Ket and Yugh dates after the Kirghiz (Turkic) intrusion into the Yenisei region (circa 700AD). The divergence of Kott and Assan is probably linked to population shifts triggered by Mongol expansion after 1206AD. The breakup of Arin and Pumpokol was possibly connected with the rise of the historic Turks after 552AD. This branch shows the most internal divergence but also some notable shared innovations, such as the change of palatal stops to velars (cf. cognates for 'stone'), the odd liquid reflex /l/ from PY *k^{w} ('winter', 'light'), and the reduction of certain original disyllables to short-vowel monosyllables ('snow sled'). Similarities between Arin and Pumpokol also include shared retentions, such as the preservation of word-initial non-labialized velars before certain vowels; non-labialized velars dropped before all high vowels in the remaining

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[1] Falling tone is a Yeniseic innovation from fricative deletion and has no analog in the tonal systems of Na-Dene, where the consonant is retained instead: cf. Central Ket *kù:nə* 'wolverine' vs. Proto-Athabaskan-Eyak **k^{h}una^{ʔ}s* 'wolverine'; Yugh *čì:^{h}x*, Ket *tìx* 'snake' vs. Proto-AE *tɬ^{ʔ}əχ^{ʔ}x^{w}* 'snake, eel'; and also in words for 'holding hook: Yugh *su:^{h}ɬ*, Ket *sùl* 'holding hook' (< *suxl* < *suk-l*), Proto-AE *x^{w}əq^{ʔ}ɬ* (< *x^{w}əq^{ʔ}-ɬ*) – where *ɬ* in both families is a suffix that derives man-made objects.

[2] This possibility is suggested by the fact that the vowels in question generally echo root vowel quality, whereas vowel-harmony is generally lacking elsewhere in Yeniseic. Comparisons with potential cognates in Na-Dene also point toward an original complex coda: Tlingit *quč* 'wolf', Proto-Athabaskan **q^{ʔ}a·ts^{ʔ}* 'be cold', *q^{ʔ}əχš^{w}* 'alder' (cf. Yugh *ú:^{h}s*, Arin *kus* 'birch'). The full system of Dene-Yeniseic velar-uvular correspondences and their interaction with different vowel nuclei must be worked out before the cognate status of such words can be judged, however. Cf. also in this regard the resemblance between Proto-AE *q^{ʔ}əx* 'birch' with Modern Ket *qɯ^{ʔ}* 'birch bark' first noted by Ruhlen (1999).

languages, as well as before /u/ in Pumpokol (cf. Arin *kul* vs. Pump. *ul* 'water'). Innovations in the other two branches include the Kott/Assan change of unaspirated, non-labialized **k* to /h/, with Kott /k/ representing the reflex of an original labialized velar (cf. cognates for 'winter', 'bright'). Another is Ket/Yugh back unrounded vowels /ɯ/ from /i/ and /ɤ, ʌ/ from /e, ɛ/[3] after an original aspirate ('two', 'stone') or to compensate the loss of labialization in the preceding velar or uvular ('wolf', 'winter').

The genetic and typological contrast in grammar and lexicon between Ket and other Siberian families is a recurrent topic of comment, even by scholars who do not realize that Yeniseic, unlike all other north Asian languages, contains phonemic tones. In truth, Yeniseic also shares equally prominent contact-induced traits with the South Siberian Turkic, Samoyedic, and Evenki. These include long-distance nasal harmony, a tendency toward deaffrication, and bound relational morphemes attaching to finite verb forms to express a wide range of clausal subordination types (Anderson 2003). Yeniseic nominal enclitics mimic in many ways the suffixal case systems of geographically contiguous families. Such commonalities probably accrued over the centuries as small populations of Yeniseic speakers interacted with neighboring groups. At the same time, Ket appears to have remained fairly impervious to deliberate borrowing. Most fully assimilated loanwords derive from Russian, and even these are surprisingly few. In contrast to its morphological patterns, the Ket lexicon displays little historical influence from other North Asian languages. Yeniseic influence on the neighboring languages appears limited to loanwords, with the characteristic Yeniseic phonological and morphological patterns having little or no impact.

3 Yeniseic substrate elements in modern Siberian languages

This section provides a sampling of Yeniseic elements – mostly loan vocabulary – know to have been acquired by other languages of central Siberia. These include northern Samoyedic and western Evenki, which borrowed a few words through adstrate influence during centuries of contact with Yeniseic speakers. In most cases, contact occurred between separate and often hostile groups. Also discussed are Yeniseic substrate influences on Southern Samoyedic and South Siberian Turkic that accrued when these peoples shifted from an original Yeniseic language.

The clearest attestation of Yeniseic substrate influence can be found in Ös (Chulym Turkic) the most northerly Turkic language of the Yenisei watershed and still spoken on the Chulym River in former Pumpokol territory. Dul'zon (1952) noted the calqued 13-month calendar and the name of the Big Dipper constellation, imitating Yeniseic *qàj* 'elk'. This influence reflects a continuity of elements of hunter-gatherer lifestyle long after this group adopted Turkic speech. An obvious Yeniseic substrate also appears in northern dialects of South Siberian Turkic, where the names of certain ethnic subdivisions among the Northern Altai, Shor, and Khakas, and presumably the actual clans themselves, originate from Yeniseic. Maloletko (2002:255) identified the Khakas clan (*seok*) names *tiin* as Yeniseic; as well as the Shor clan names *kobɨj* and *kɨj*. In general, Siberian

[3] The distinction between /ɤ,ʌ/ and /e, ɛ/ in Ket and Yugh is allophonic; the raised variants [ɤ,e] occur only in high-tone syllables; cf. (***) below.

ethnonyms of the type *din, tin, čan*, etc., typically derive from the native Yeniseic word for 'people': Ket *dɛ^{ʔ}ŋ*, Yugh *d^{j}ɛ^{ʔ}ŋ*, Kott *čɛaŋ*. This component regularly appears in Yeniseic ethnonyms including the traditional Yugh self-designation *kʌndɛŋ* 'light-skinned people'; Ket *bogdɛdeŋ* and *qɛntadeŋ* 'Fire People' and 'Big Ski-pole Ring People' – the names of the two Ket 17th-century exogamous clans; *hannacheen*, the Kott name for the Arin; and perhaps the Pumpokol self-designation *gebeng* 'upland people' (cf. Ket *qa^{ʔ}j* 'mountain, bluff'). The Todzhi subgroup of the Tuvan nation also contains a Yeniseic substrate, with the Toodut and Khoyuk clans identified as Yeniseic by Soviet ethnographer S. I. Vajnshtejn (cf. annotations in Vajda 2001:284-5). The extinct Southern Samoyedic languages Mator, Koibal, Kamasin, and Karagas, peoples known to have originally been speakers of some Yeniseic language, apparently contained a substantial number of substrate loanwords. This is attested by the presence of obvious Yeniseic words in the 19th century word lists gathered from these languages (Dul'zon 1962, Verner 1990b). Eastern Khanty dialects also contain signs of a Yeniseic substrate that seems to include words for different sizes and types of rivers (cf. Maloletko 2002:78, 118-121). This is not surprising, given the extensive presence of Yeniseic substrate river names throughout much of the Ob-Irtysh watershed.

Butanaev (2004:227-8) has made the most detailed study of Yeniseic lexical influence in South Siberian Turkic, particularly Khakas. He identified a few dozen loans and calques. These can be placed in four semantic groups that reflect an original hunting-gathering forest culture:

1. Landscape and other natural features: 'snow on tree branches' – Khakas *tikper*, Ket *tokpɯl*; 'swampy ground': Khakas *ɨlban*, Ket *lɯmba*; 'summit, top': Khakas *tigej*, Altai *tegej*, Tuvan *tej*, Ket/Kott *tiɣij*, *tagaj* (from an older Yeniseic word meaning 'head'). Modern Ket 'head', *kʌjgá*, was borrowed as Khakas *xɨjga* 'smart, clever'. Khakas also contains calques based on Yeniseic models, such as *kugurt čolɨ* 'rainbow'; cf. Modern Ket *ɛkkaŋna qɔ^{ʔ}t* 'rainbow', both literally meaning 'lightning road'.

2. Flora: Kott *šet* 'larch (*Larix*)' > Khakas *čet*, Altai/Tuvan *šet* 'young larch'; 'mountain ash (*Sorbus*)': Khakas dialectal *sojbe*, Arin *šulbe*; 'alder (Alnus)': Khakas *sug agazɨ*, Ket *sojga*; Khakas dialectal *emin* pine nut, kernel' vs. Ket *èm*; 'sweet substance beneath the bark of pine trees': Khakas dialectal *malɨn*, Yugh *falaŋ*; 'dead tree, snag': Khakas *xoolgan*, Altai/Tuvan *kuulgɨ*, Ket *kɔlɛn*; 'moss growing on trees': Khakas dialectal *tabɨj*, Kott *topa:k*.

3. Fauna: 'squirrel': Khakas *saxɨl*, Ket *sa^{ʔ}q*, Yugh *sa^{ʔ}χ*; 'seagull': Khakas *xajlax*, Ket *qalɛŋ*; 'curlew': Khakas *tondolbus*, Ket *tógdùlt*.

4. Hunting and fishing: 'wood-tipped arrow': Khakas *sogan*, Yugh *soham*; Khakas *tolanat* 'weir' vs. Ket *tɔltɛn* 'dam, weir'; Chulym Khakas *ajbun* 'drop net' vs. Yugh *ajfen* 'drop net'; Khakas *ulban* 'lake bank where a freshwater steam is flowing' vs. Ket *ulbaŋ* 'bank'; Khakas *kürüp* 'pit trap' vs. Kott *kurup* 'burrow'; 'pouch, bag': Khakas *meleček*, Kott *falančak*; snow sled – Khakas *soor*, Siberian Tatar *tsuir*, Arin *čel*, Kott *čogar*. The South Siberian Turkic ethnonym "Shor" may also derive from Yeniseic 'snow sled',

reflecting the fact that the Shor, after shifting to Turkic, continued to live as forest hunters, with the snow sled their essential means of winter travel.

Yeniseic loanwords in the languages of more northerly peoples with whom the Ket interacted in historic times are less numerous. Of all their neighbors in the Yenisei River watershed, the Selkup maintained the closest and most friendly relations with the Ket, often interchanging marriage partners. Not surprisingly, a number of words for family relations and spiritual culture were borrowed between the two peoples. The Ket word for Selkup, *la$^{?}$k* derives from the Selkup word for 'friend'. Kim-Maloney (2004) identifies several possible Ket loans in the southern Selkup dialects, including *aqlalta* (< Ket a*llɛl*), a term for the wooden figures with beaded eyes that housed the family's guardian spirit.

Adjacent groups with whom the Ket maintained a more adversarial relationship borrowed fewer terms. The Evenki, who were pushing into the Yenisei basin at the time of the Russian's arrival in the early 17th century, were hostile to the Ket. Only a few words for local material culture have been identified in the western dialects of Evenki. The Ket likewise had usually hostile relations with their northern neighbors, the Nenets and Enet. Forest Enets contains a few Ket loans, including possibly the third-person singular pronoun *bu.* This pronoun is nearly identical to Ket *bū'* 'he, she', though a Turkic origin for both is also conceivable.

Beyond this rather modest lexical influence, borrowed Yeniseic grammatical or phonological features are difficult to substantiate. Badgaev (1988) suggests that the affricates *dz, ts* in Buryat Mongol diffused from Kott, which, however, did not have these sounds as phonemes. Rassadin (1971) traces the origin of pharyngealized Tuvan vowels to a Yeniseic substrate, a position rejected by Werner (Verner 1973). The feature in question appears in native Turkic vocabulary and does not seem to correlate with the pharyngealization found in Yeniseic falling tone monosyllables. Janhunen (1986:167-8) suggests that the glottal stop in Nenets diffused from Ket. Once again, without evidence for more extensive Yeniseic influence on Nenets phonology and language structure, it is likely that the shared feature in question is a coincidence. Greg Anderson (personal communication) noted that the high back unrounded [ɯ] could have been borrowed into South Siberian Turkic from Yeniseic. But even if such isolated features represent Yeniseic substrate or adstrate influence, they are certainly not part of any larger, more significant contact-induced change.

While the lexical items noted above are by no means intended as an exhaustive inventory of Yeniseic loan vocabulary in the languages of western and central Siberia, they do provide a sense of how limited was the impact of the once extremely widespread Yeniseic family on the region's subsequent language families. Also noteworthy is the general absence of phonological influence from Yeniseic on neighboring families. The probably reason for this absence is that in instances of language shift to Turkic or Samoyedic occurred over a few generations. This left a scattering of substrate loanwords, mostly having to do with the natural landscape or forest life, but did not produce any creolizating effect on the grammar or phonology of the group's newly acquired non-Yeniseic mother tongue. In cases of adstrate contact between Ket and neighboring Siberian peoples, whether amicable of hostile, it was the Ket who typically learned to communicate in the outside language – a bilingualism largely unreciprocated. With such limited exposure to Ket linguistic structures, speakers of Nenets, Enets, Selkup, and Evenki typically acquired only a few isolated Yeniseic loanwords but none of the

typically Yeniseic grammatical and phonological characteristics, such as phonemic tones, possessive prefixes, or prefixing verb morphology.

4 Grammatical features shared between Ket and other Inner Eurasian languages

While Yeniseic influence on other Siberian language families is limited mainly to the lexical realm, Yeniseic languages themselves generally show an even stronger resistance to adopting foreign vocabulary. This continues to be true even of the last generations of fluent Ket speakers today. The informants I have worked with reject most Russian words in Ket, preferring instead to coin their own neologisms, such as *ē·γ suul* 'iron sled' for 'car', and *hilaŋ na$^{?}$n* 'sweet bread' for 'cake', and *qʌliŋ ū·l* 'bitter water' for 'coffee'. A survey of Modern Ket loan vocabulary (Vajda, in preparation) reveals that over the past two millennia only a few loanwords have taken firm root. All of these name important acquired items of material culture, such as *talūn* 'flour' from Turko-Mongol, *sa$^{?}$j* 'tea' from Russian *čaj*, and *kančá* 'pipe (for smoking)' from Chinese. Virtually none of the core Ket vocabulary is borrowed, and much of it is clearly inherited from Proto-Yeniseic, judging from cognates in the extinct sister languages. Though it is difficult to gauge the extent of borrowing in the extinct Yeniseic languages due to the more fragmentary documentation of their lexicons, Yeniseic appears to resemble Athabaskan in its enduring resistance to lexical borrowing. Turkic and Russian loanwords in Kott and Assan appear to have been more numerous. But this may reflect the fact that these languages were recorded only during the final stages of obsolescence, when all of the remaining speakers had already switched to one of the Siberian Turkic dialects or to Russian for most of their communication needs.

The morphological influence of the surrounding languages on Yeniseic was much farther reaching, and appears to have been well under way even during the time of Common Yeniseic. In this sense, Yeniseic languages belong firmly to the broader Inner Eurasian spread zone with its penchant for suffixal agglutination, despite their stark underlying genetic and typological dissimilarity to the other language families of Eurasia. Shared features include an extensive system of postposed bound relational morphemes. Yeniseic cases and postpositions are functionally and structurally analogous to the case suffixes and clausal subordinating enclitics found in neighboring Turkic and Samoyedic languages (Anderson 2002, 2004). In Yeniseic, however, the morphemes in question show signs of having arisen by coalescence. What are usually described as cases in Yeniseic still pattern phonologically as enclitics rather than true suffixes (Vajda, in press 1). The system of grammatical enclitics in Yeniseic also shows morphological heterogeneity. One set cliticizes directly to the preceding nominal stem. These include the instrumental, caritive (meaning 'without'), locative (used only with inanimate-class nouns), and the prosecutive (meaning 'past' or through'). In particular, the prosecutive is typical of North Asian case systems (Anderson 2004).

(*) *Case-like enclitics in Ket that attach directly to the noun stem*

	masculine animate class	*feminine animate class*	*inanimate class*

	'god'	'gods'	'daughter'	'daughters'	'tent'	'tents'
locative	-	-	-	-	*qus-ka*	*quŋ-ka*
prosecutive	*ɛs-bɛs*	*ɛsaŋ-bɛs*	*hun-bɛs*	*hɔnaŋ-bɛs*	*qus-bɛs*	*quŋ-bɛs*
instrumental	*ɛs-as*	*ɛsaŋ-as*	*hun-as*	*hɔnaŋ-as*	*qus-as*	*quŋ-as*
caritive	*ɛs-an*	*ɛsaŋ-an*	*hun-an*	*hɔnaŋ-an*	*qus-an*	*quŋ-an*

The other set requires an augment in the form of a possessive morpheme as connector, analogous to the way possessive noun phrases are constructed:

(*) *Possessive noun phrases*

hun=d qu^{ʔ}s	*hɯp=da qu^{ʔ}s*	*dɯlgat=na qu^{ʔ}s*
daughter=POSS.FEM tent	son=POSS.FEM tent	children=POSS.ANIM.PL tent
'daughter's tent'	'son's tent'	'children's tent

As in possessive phrases, these augments reflect class and number distinctions of the preceding (possessor) noun: *da* (masculine class singular), *na* (animate class plural), *di* 'feminine class singular or inanimate class singular and plural):

(*) *Case-like enclitics in Ket that require a possessive connector*

	masculine animate class		*feminine animate class*		*inanimate class*	
	'god'	'gods'	'daughter'	'daughters'	'tent'	'tents'
ablative	*ɛs-da-ŋal*	*ɛsaŋ-na-ŋal*	*hun-di-ŋal*	*hɔnaŋ-na-ŋal*	*qus-di-ŋal*	*quŋ-di-ŋal*
dative	*ɛs-da-ŋa*	*ɛsaŋ-na-ŋa*	*hun-di-ŋa*	*hɔnaŋ-na-ŋa*	*qus-di-ŋa*	*quŋ-di-ŋa*
benefactive	*ɛs-da-ta*	*ɛsaŋ-na-ta*	*hun-di-ta*	*hɔnaŋ-na-ta*	*qus-di-ta*	*quŋ-di-ta*
adessive	*ɛs-da-ŋta*	*ɛsaŋ-na-ŋta*	*hun-di-ŋta*	*hɔnaŋ-na-ŋta*	*qus-di-ŋta*	*quŋ-di-ŋta*

Postpositions concatenate with case-like enclitics to form long agglutinative strings that prosodically represent single words, with a stress on the first syllable:

(*) *Suffix-like concatenations of relational enclitics in Ket*

dɛŋ-na-hɯt-ka	*hɯp-da-ʌʌt-di-ŋa*	*quŋ-d-inbal-di-ŋal*
people-PL-under-LOC	son-PL-M-on-N-DAT	tents-N-between-N-ABL
'located under the people'	'onto the son'	'from between the tents'

Etymologically, many Ket postpositions are obvious adaptations of body part nouns or other noun roots: *-hɯt* 'under' < *hɯ̄ˑj* 'belly'; *-ʌʌt* 'on the surface' < *ʌʁat* 'back'; *-inbal* 'between' < *inbal* 'gap, space between objects'. The resulting concatenations superficially resemble the strings of suffixes in Turkic and Samoyedic languages.

Likewise in imitation of other North Asian suffixal agglutinating languages, many of the bound relational morphemes used in the Ket nominal system can also be added to finite verb forms to express various kinds of clausal subordination:

(*) *Ket temporal subordination with* kupka *'before' (literally, 'on the beak')* (Werner 1997c:351)

āt	*qárɛ*	*énŋuŋ*	*bɔɣótn-kupka*	*āt*	*qaséŋ*	*kiˀ*	*quˀs*	*thápto*
I	that	village	I.walk-before	I	there	new	house	I.stand.it

'Before I move to that village, I'll build a new house there.'

(*) *Ket non-temporal subordination with the non-augmented postposition* dɔɣɔt *because, since'* (Werner 1997c:350)

āt	*émilta-ŋ*	*dáŋatɛt-dɔɣɔt*	*ɔ́kŋ*	*āt*	*qáriɣa*	*īˈm*	*kʌ́tnibɛtn*
I	cone-PL	I.hit.them-since	you.PL	I	later	pine.nuts	you.give.them

'Since I'm knocking down the cones, you give me the pine nuts later.'

All of this closely parallels the use of postposed bound relational morphemes in other North Asian languages (Anderson 2004).

Vajda (in press 1) argues that Ket nominal relational enclitics are not a true case system, but have the transpositional function of negating the head status of the nouns and verbs by converting them to adjuncts. The stem-like, derivational nature of the resulting concatenations is clearly evident when such forms are re-converted to nouns by adding the nominalizing suffix *-s*:

(*) *Nominalizations made from nouns with case-like enclitics*

qus-di-ŋal-s	*qaɣ-an-s*
tent-N-ABL-NMLR	speech-CARITIVE-NMLR
'the thing (or person) from the tent'	'speechless one, mute person'

(*) *Nominalizations made from postpositional constructions in Ket*

qus-t-hɯt-di-ŋal-s	*aq-na-inbal-ka-s*
tent-N-under-N-ABL-NMLR	trees-ANIM.PL-between-LOC-NMLR
'the one from under the tent'	'the one between the trees'

The fact that bound-relational morphemes in Ket do not build a discrete inflectional paradigm is paralleled by their etymological heterogeneity. As shown above, some case-like morphemes are added to the bare stem (*-as* 'with', *-an* 'without', *-ka* 'in, at', *-bes* 'past, through'), while others require a possessive augment (*-di-ŋal* 'from', *-di-ŋa* 'to', *-di-ta* 'for', *-di-ŋta* 'at'). Similarly, possessive augments are obligatory with many morphemes conventionally described as 'postpositions' due to their semantics or transparent denominal etymologies (*-d-hɯt-* 'beneath', *-d-ʌʌt-* 'on', *-d-hɯj-* 'inside', *-d-kup-* 'in front of', *-d-tan* 'toward', *-d-qɔn* 'up to', etc.). Other postpositions are added to stems directly, exactly like the set of non-augmented case suffixes: *-dɔɣɔt* 'for the sake of', *-asqa* 'resembling'. And morphemes belonging to all four of these semantic and etymological subgroups may attach to finite verbs as clausal subordinators: augmented and case-like (-

di-ŋal 'since'), non-augmented and case-like (*-ka* 'while'), augmented and postposition-like (*-d-kup-ka* 'before'), and non-augmented and non-postposition-like (*-dugde* 'during', *dɔɣɔt* 'because').

Although a system of case-like enclitics was clearly present in Common Yeniseic, having also been documented for Kott (Castrén 1858; Werner 1997a), the actual morphological material used to create it varies tellingly across the Yeniseic daughter languages. This further suggests typological adaptation to the neighboring suffixal agglutinating languages rather than inheritance from Proto-Yeniseic. Kott uses different shapes of pronominal augments: masculine singular *a* rather than *da*, feminine singular or inanimate-class *i* rather than *di*. Note also Kott *-čaŋ* vs. Kett *-ŋal* for ablative meaning. Kott *-čaŋ* derives from a root meaning 'drag, path', while Ket *-ŋal* may be connected with morphemes meaning 'extend' (cf. Ket *-la* 'more, rather'). This suggests that the system of case-like enclitics arose at least in part after the breakup of Common Yeniseic, presumably in imitation of suffixal agglutination. Although none of the enclitic shapes themselves do not appear to have been borrowed, their overall formal and functional similarity to the nominal case and postpositional systems of Turkic, Samoyedic, and other Inner Eurasian families further supports the probability that they developed on the basis of long-term language contact. The use of bound relational morphemes in Yeniseic as well as Turkic and Samoyedic to subordinate finite verb forms to a main clause (Anderson 2004) further demonstrates the degree to which key typological features of Inner Eurasian languages have influenced Yeniseic linguistic structure.

The vehicle for grammatical adstrate influence on Yeniseic appears to have been the tendency for Yeniseic speakers to maintain communicative skills in the languages of surrounding peoples. This bilingualism was not reciprocated. Even among the Selkup, traditional friends and marriage partners of the Ket, the Ket language had the reputation of being difficult to learn, so that inter-ethnic communication normally occurred in Selkup. This situation only changed during the mid-20th century with the adoption of Russian as a lingua franca by all Siberian peoples. Women from other ethnic groups taken into exogamous Ket society as wives may also have affected Yeniseic grammar and phonology over the centuries. The resultant situation of few loanwords but significant grammatical and phonological influence would parallel that observed by Aikhenvald (2003) for Tariana – an Amazonian language that likewise resists lexical borrowing but whose grammatical structure was strongly influenced by the neighboring languages. Unlike the situation with Tariana, there is no record of linguistic exogamy in Inner Eurasia; however, the exogamous moieties (*hɔɣɔtpɯl*) observed among the Ket in the 17th century may represent a vestige of inter-ethnic accommodation between Yeniseic tribes and their neighbors dating back to Common Yeniseic, the era that witnessed the beginning of significant adaptation to the morphological patterns of neighboring languages. In historic times, the rarity of outsiders learning Ket appears due to the language's phonemic prosody and especially to its highly complex prefixing verb morphology – core Yeniseic features with no analog in the surrounding families. But over the centuries even these most typical Yeniseic features were strongly influenced by the predominant Inner Eurasian language type. Because these traits were not replaced, but rather adapted to create unique intermediate patterns, the result of contact produced a hybrid morphological patterning that could be called "typological accommodation".

5 Accommodation of Yeniseic typological features to the Inner Eurasian linguistic area

Beneath the underlay of Inner Eurasian areal features, Yeniseic displays a core of features that radically distinguishes this family from all of the surrounding families. These features are the basic vocabulary, phonemic tones, pronominal possessive prefixes, and complex prefixing verb morphology. Family-internal comparisons demonstrate that these traits are autochthonous to the family, predating the influence of Samoyedic, Turkic, Mongolic and Tungusic – families that spread at the expense of Yeniseic via the economic dominance of reindeer and stock breeding over forest hunting and gathering. A further, more striking demonstration that the features in question have no historical connection with other known language families of Eurasia comes from examining linguistic parallels with Na-Dene (Athabaskan-Eyak-Tlingit), a family with which Yeniseic shares a demonstrable genetic link (Vajda 2006a,b). Cognate lexical items and morphological structures in these families provide an additional vantage for estimating the typological state of Proto-Yeniseic before the spread of animal husbandry in Inner Eurasia.

This section examines how core Yeniseic morphological traits were gradually modified to become more like the radically different language type of the surrounding peoples – a process I have called typological accommodation. Malcolm Ross's (2001) term "metatypy," or "grammatical calquing", is too strong in this case, since accommodation does not represent typological replacement but rather the achievement of a new, unique hybrid between two originally radically different morphological types.

The areally unique Yeniseic features that underwent typological accommodation to Samoyedic and Turkic languages – particularly the phonemic prosody which became eroded in longer, agglutinative word forms and the prefixing verb structure, which became restructured as suffixing – all display unmistakable genetic parallels to Na-Dene, the language family of the last group of American Indians to become established in North America. This link further attests to the originally alien typology of Proto-Yeniseic vis-à-vis the suffixing, non-tonal families of Inner and North Asia. Modern Ket, the best documented Yeniseic language, provides the best available illustration of how these traits came to mimic, without actually being replaced by, the prevailing morphological and phonological patterns of the surrounding languages. The resulting uniqueness of Modern Ket morphology is largely a product of this process of structural hybridization.

Phonemic tone in Proto-Yeniseic and its link with Na-Dene glottalized codas. The first speculation that the Ket, among Siberian peoples, have a special connection with Native Americans dates back to Adriaan Reeland in 1708 (Vajda 2001:2). The first scholar to suggest a link between Yeniseic and Na-Dene was Italian linguist Alfredo Trombetti in 1923, on the basis of random lexical similarities involving Ket, Kott, Tlingit, and Athabaskan (Vajda 2001:280). Evidence precise and extensive enough to prove this connection can shed invaluable light on the typological structure of Proto-Yeniseic before contact-induced influence from pastoral languages. Vajda (2006b) provided interlocking sound correspondences in several dozen basic vocabulary words to argue that Yeniseic and Athabaskan-Eyak-Tlingit (Na-Dene minus Haida) are indeed genetically related in a

family that could be called Dene-Yeniseic. One striking piece of phonological evidence is how the distribution of Yeniseic high and glottalized tones parallels that of high vs. low tone in Athabaskan. In both families, the phonemic contrast in prosody arose based on an original contrast between glottalized and non-glottalized codas consonants. As is know (cf. Krauss 2005), modern Athabaskan languages are of three prosodic types. In non-tonal languages such as Koyukon and Ahtna, coda glottalization disappeared without any effect on vowel prosody. The Athabaskan languages that developed a phonemic contrast in tone are of two types. In "high-marked" languages such as Dene (Chipewyan), coda glottalization yielded high tone, while syllables without an original glottalized coda became low tone. In "low-marked" languages such as Navajo, the opposite situation prevailed: syllables with original glottalized codas became low tone, while other kinds of syllables became high-tone by contrast.

Yeniseic cognates to Athabaskan show a pattern of high tone in syllables originally ending in a glottalized coda, and lower, laryngealized tone in other syllables. Compared to Athabaskan, Yeniseic resembles a high-marked language, with the added development of laryngealization in the contrasting low tone. Example (*) shows this precise correlation, which only applied in the case of Yeniseic cognates that have not undergone further tonogenetic processes, such as the loss of a fricative in the second part of the word, which yielded falling tone. Voiceless unaspirated obstruents in the Proto-Athabaskan-Eyak forms in (*) are transcribed /č, t, k, q/ rather than /dž, d, g, G/, as is more customary in the writings of historical Athabaskanists. In the Dene and Navajo words, *d, g* represent voiceless unaspirated *k, t*, following the orthographies used for those languages. The symbol "v" represents any vowel nucleus, short or long. Except for these transcriptional adjustments, the Proto-Athabaskan-Eyak forms reproduce the well-reasoned system of "Pre-Proto-Athabaskan" reconstructions developed by Jeff Leer (cf. Leer 1999).

(*) *Systematic correspondences in tone between Yeniseic and Athabaskan*

Modern Yeniseic high marked		**Modern Athabaskan** high-marked	low-marked	***Proto-Athabaskan-Eyak** non-tonal proto-forms with	
Ket	**Yugh**	**Dene**	**Navajo**	**phonemic coda glottalization**	
C$\bar{v}$·C	C$\bar{v}$C	Cv́(C)	Cv̀(C)	< *CvC^{ʔ} (original glottalized coda)	
đīʻk	*dʲīk*	*dzé*	*džèèh*	**čeˑq^{ʔ}*	*conifer resin*
sēˑŋ	*sēŋ*	*ðór*	*sèd*	**sənt^{ʔ}*	*liver*
hūˑn	*fūn*	*sí^{n}θ*	*sèè^{n}s*	**xeˑn^{ʔ}ts^{ʔ}*	*wart*
Cv^{ʔ}C	Cv^{ʔ}C	Cv̀(C)	Cv́(C)	< *CvC (original non-glottalized coda)	
hu^{ʔ}s	*fu^{ʔ}s*	*sə̀θ*	*(hìs)*[4]	**χəs*	*pus/mold*
qɯ^{ʔ}[5]	*χɯ^{ʔ}*	*gòr*	*gééd*	**q^{w}eˑt*	*poke/skewer*

[4] In Modern Navajo all short-vowel closed syllables (cf. *hùs* 'pus', *ẑìn* 'black') lost the original high tone through analogical leveling, obscuring the original tonal correspondence.

[5] Yeniseic-internal morphology reveals a closer match to the Proto-Athabaskan-Eyak forms than this chart would suggest. For example, in Ket *qɯ^{ʔ}* 'skewer, ray', the original coda /d/ reappears in the plural *qʌdeŋ*

*sʌ^{ʔ}n sʌ^{ʔ}n zèn (ẑìn)[3] *x^{w}ən^{j} dark color*

Ket/Yugh high-tone words ('resin, liver, wart') correlate with Athabaskan high tone in a high-marked language (Dene) but with low tone in a low-marked language (Navajo). This pattern exists because each of these sets of tonal contrasts reflects the same original opposition, presumably in earlier Proto-Dene-Yeniseic, between the presence or absence of coda glottalization.

While the origin of high vs. low tone in Athabaskan can be deduced from a comparison with non-tonal Eyak, which preserved the original glottalized codas, the Ket/Yugh contrast between high vs. laryngealized tone requires external comparison with Na-Dene to reveal its ultimate origin, since the tonal opposition was apparently present already in Proto-Yeniseic.

Typological accommodation of Ket prosody. Under the influence of the root-initial agglutinating languages of Inner Eurasia, the tonal prosody in Yeniseic developed so that phonemic differences in pitch are largely the domain of monosyllabic words (Vajda 2004, in press 1).

Ket monosyllabic phonological words contain four phonemic prosodemes. These can be called 'tones', though they actually consist of an amalgam of melody, vowel length, vowel height and tenseness (in the case of mid vowels), and the presence or absence of laryngealization (creaky voice).

(***) *Phonemic prosodemes in Southern Ket monosyllables*

	tonal melody	vowel length (syllable type)	phonation type	mid-vowel quality
sū·l 'blood'	high-even	half-long (closed or open)	neutral	tense [e, ɤ, o]
su^{ʔ}l 'salmon'	abrupt rising	short (closed or open)	laryngealized (creaky)	lax [ɛ, ʌ, ɔ]
súùl 'snowsled'	rising-falling	long (closed or open)	neutral	lax [ɛ, ʌ, ɔ]
sùl 'holding hook'	falling	short (closed only)	neutral	lax [ɛ, ʌ, ɔ]

In polysyllables, many of which were created by attachment of relational morphemes, distinctions in root prosody generally erode, being replaced by a rise and fall of pitch on the first two syllables that resembles word-initial stress. The degree of prosodic erosion – in other words the degree of clitic-like vs. suffix-like behavior of the relational morpheme – is free to vary to express distinctions in focus:

'skewers, rays' and in the CK infinitive *qùːdə* 'to dig', which developed falling tone through erosion of the infinitive suffix. Irregularities in Yeniseic plural formation often find explanation through comparison with Athabaskan-Eyak. In Ket *sɛŋn-in* 'livers, innards' (cf. *sē·ŋ* 'liver'), and *hɯtn-an* warts' (cf. *hū·t* 'wart'), the plural stem augments echo the original presence of coda clusters. The velar coda in Yeniseic words for 'resin' derives from an earlier uvular: cf. the Ket verb root *-daqŋ* 'glue down with resin'. Sequences of /iq/ or /uq/ absent since uvular /q/ became /k/ everywhere high vowels.

(*) *Degrees of prosodic erosion in* ō·p *'father'* + da-ŋal *'from'*

focused	neutral focus	backgrounded	nominalized as a stem
ō·p-da-ŋal	*ōp-da-ŋal*	*ɔb-da-ŋal*	*ɔb-da-ŋal-s 'the one from father'*

Disyllabic stems have rising/falling pitch under focus or when pronounced in isolation. In a few, the pitch peak falls on the second syllable, giving the impression of stress on the second syllable. These are marked in our transcription with an acute accent on the second syllable. The much more common syllable-initial prosodic prominence is left unmarked. This low-yield distinction in disyllables is likewise eroded by the attachment of relational morphemes:

(*) *Phonemic contrast in disyllabic stem prosody and its erosion before relational morphemes*

rising-falling pitch:	*qɔpqun* 'cuckoos' >	*qɔpqun-di-ŋal*	'from the cuckoo'
rising-high falling pitch:	*qɔpqún* 'cuckoos' >	*qɔpqun-na-ŋal*	'from the cuckoos'

The discourse-related replacement phonemic prosody with a generally non-contrastive word-initial emphasis in polysyllables renders Modern Ket phonology closer to that of the surrounding languages. Yeniseic failed to develop vowel harmony, but combinations of stem plus strings of grammatical suffixes or clitics – with only the first syllable nucleus capable of reflecting the language's full range of phonemic distinctions – organizes the phonological word in an analogous fashion.

Typological accommodation of relational morphemes in the Yeniseic nominal system. It has already been show in Section 4 how Yeniseic encliticized relational nouns to nominal forms to build a system resembling the case suffixes of Turkic and Samoyedic. The addition of enclitics to Yeniseic nouns – sometimes with the help of possessive augments, sometimes without – closely mimics the system of nominal inflectional suffixes of the surrounding languages.

(*) *Ablative, dative, instrumental, and locative forms of 'rock' in some Inner Eurasian languages*

	'from the rock'	'to the rock'	'with the rock'	'on the rock'
Ket	*tʌs-di-ŋal*	*tʌs-di-ŋa*	*tʌs-as*	*tʌs-ka*
Yugh	*čʌs-di-ŋəːr*	*čʌs-di-ŋ*	*čʌs-faj*	*tʌs-kɛj*
Khakas	*tas-taŋ*	*tas-xa*	*tas-naŋ*	*tas-ta*
Tuvan	*daš-tan*	*daš-ka*	*daš-bile*	*daš-ta*
Selkup	*pʊ-kɔlɪk*	*pʊ-nɪk*	*pʊ-sa*	*pʊ-qɪn*
Evenki	*xiːsɛ-duk*	*xiːsɛ-duː*	*xiːsɛ-t*	*xiːsɛ-lə*
Mongolian	*čʊlʊn-as*	*čʊlʊn-ru*	*čʊlʊn-aɬ*	*čʊlʊn-d*

As discussed in Section 4, the Yeniseic "case suffixes" are actually enclitics with variable prosodic behavior; they only sometimes fuse with the preceding noun to form a single phonological word. When the preceding noun or pronoun is focused, these morphemes are enclitics, and the monosyllabic tonal prosody of their host is partly or fully retained.

(*) *Retention of select prosodic features as a means of expressing contextual focus*

a. *Focus on the addressee: host remains prosodically separate from the clitic*

ā·m	***ō·p-da-ŋa***	*da=qaiŋna*
mother	father-M-ADESS	FEM.SBJ=told

'Mother told *father*.'

b. *Unfocussed addressee: relational morpheme fuses with its host, forming a polysyllabic phonological word*

ā·m	***ɔb-da-ŋa=ra***	*qaiŋna*
mother	father=M-ADESS=FEM.SBJ	told

'Mother told father.'

Conversely, if the referent in question is entirely backgrounded in discourse, as in (*b) below, the pronoun can drop altogether, leaving the relational morpheme to stand entirely on its own, something no true case suffix can do:

(*) *Presence or absence of the pronoun host of the dative morpheme used as a discourse-tracking device*

a.

ō·p	*búŋ-na-ŋa*	*t=qáiŋna*
father	3P-ANIM.PL-ADESS	MASC.SBJ-told

'Father told them (neutral focus, not backgrounded).'

b.

ō·p	*ná-ŋa=r*	*qáiŋna*
father	ANIM.PL-ADESS=MASC.SBJ	told

'Father told 'em (backgrounded).'

Notice that in (*b) the subject marker encliticizes to the preceding string. Although this marker is part of the morphological verb, it tends to encliticize to any preceding word in fast speech. The reason for this will be discussed below.

Bound relational morphemes after non-focused nouns or pronouns in Ket this mimic the suffixal case systems of Turkic and Samoyedic. But these morphemes are not true inflections, since their phonological and morphological behavior varies between the prosodic status of suffix, clitic, and independent word depending upon discourse factors. The part-suffix, part-clitic status of the so-called case affixes in Ket represents another example of typological hybridization between an originally prefixing, somewhat isolating language and the suffixal agglutination typical of noun morphology in the surrounding languages.

Possessive prefixes – an original feature of both Yeniseic and Na-Dene – have likewise undergone an interesting evolution in Yeniseic. In Ket and Yugh, these morphemes, originally preposed to their host, became an unusual type of clitic capable of attaching to either the previous or following word[6]. In Modern Ket, whenever a preceding word is available, even a word outside the possessive phrase itself, the possessive morpheme normally encliticizes to that word. Only when no such word is available, such as in sentence initial position or after a pause, do these morphemes procliticize to the possessum. This development, while preserved the possessive morphemes as proclitics in some environments but adapted them as suffixes or enclitics in others, caused Ket morphology, once again, to move partly in the direction of suffixal agglutination. The resulting morphological change created a hybrid between a proclitic and an enclitic/suffix rather than a complete shift to suffixation. Example (*) shows the variable phonological behavior of possessive morphemes in Modern Ket:

(*) *Possessive pronominal clitics*

enclitic on possessor	enclitic on unrelated word	proclitic on possessum
qàl=da ki$^{?}$s	*en=da ki$^{?}$s*	(pause) *da=ki$^{?}$s*
grandson=MASC.POSS foot	now=MASC.POSS foot	MASC.POSS=foot
'the grandson's foot'	'now his foot…'	'his foot'

Interestingly, no reduction of root prosody is ever triggered across the proclitic boundary, regardless of distinctions in pragmatic focus. This contrasts with the variable ability of relational enclitics to fuse with the root into a single phonological word, like suffixes normally would. Presumably, all enclitics in Ket developed such fusional properties in mimicry of suffixation, whereas possessive proclitics display no prefix-like fusion with their host, since none of the languages surrounding Yeniseic possess inflectional prefixes. When the possessive morphemes attach to a preceding word, however, they usually trigger prosodic erosion in their host:

(*) *Prosodic leveling in the roots* hɯ$^{?}$p *'son' and* ē·s *'God' caused by possessive enclisis (a) vs. the absence of leveling with possessive proclisis (b)*

a.	*hɯb=da ē·s*	*ɛs=da hɯ$^{?}$p*
	son-MASC.POSS foot	God-MASC.POSS son
	'the son's God'	'God's son'
b.	*da=ē·s*	*da=hɯ$^{?}$p*
	MASC.POSS=God	MASC.POSS=son
	'his God'	'his son'

Though recorded as proclitics in all documented Yeniseic languages, the possessive morphemes of Modern Ket now take the form of suffix-like enclitics in all instances except word-initial position or when preceded by a significant pause. Typological

[6] Throughout the present article, clitics that can attach to either the following or preceding word (sometimes called "ditropic" clitics) are separated from their host with an equals sign rather than a hyphen.

accommodation to the possessive and genitive suffixes of the surrounding languages has influenced their evolution into a rare morphological object called a ditropic clitic.

The prosodic behavior of bound relational morphemes appears to have evolved under the typological influence of suffixing languages. Enclitics often fuse with their host in mimicry of suffixes, while proclitics never do but in fact tend to encliticize to the preceding word instead.

Typological accommodation of Ket verb prefixation. The most striking morphological feature of Modern Ket is its rigid series of verb prefix slots, which stand out starkly against the exclusively suffixing inflectional morphology of other verb systems in western and south Siberia. Modern Ket finite verbs conform to a morphological model consisting of eight prefix positions, an original root or base position (P0), and a single suffix position:

(*) *Position classes in the Ket finite verb (lexical morphemes shown in bold)*

P8	**P7**	P6	**P5**	P4	P3	P2	P1	**P0**	P-1
sub-ject person	**left base** (in most verbs: a word form serving as stem)	subject or object	**thematic consonant** (originally shape or animacy classifier)	*tense/ mood* or 3p animate subj or obj.	3p-inanim -ate subj. or obj.	*tense/ mood*	sub-ject or object	**base** (original verb root position)	anim. subj. plural

Several features of Modern Ket verb morphology are extremely unusual typologically. First, the configuration of subject/object markers is not determined by an overall grammatical rule, so that agreement morphemes appear in different, and largely unpredictable positional combinations. There are two productive transitive subject/object configurations, and five productive intransitive subject configurations (Vajda 2003, 2004). Which configuration a given verb requires is determined by idiosyncratic etymological factors rather than semantics and must be listed in the verb's lexical entry. Second, the position of the primary lexical root – the verb's semantic head – can be located either in slot 7 near the beginning of the verb, or in slot 0, near the end, depending on the stem in question. All of the intervening affixes therefore appear as prefixes in some verbs but as suffixes in others. A third feature of note is that tense and mood are expressed by lexically chose combinations of morphemes in two slots (4 and 2). These morphemes interact to build six productive tense-mood classes. Nearly all verbs belong to one of these classes, the difference being largely unpredictable and lexically determined. Finally, the Yeniseic shape and animacy classifiers of slot 5 are typologically unique in northern Eurasia.

The variable position of the verb's basic root morpheme and the lexical subject/object configurations, evolved when the original Yeniseic prefixing structure partly realigned itself toward suffixal agglutination by incorporating a new root verb initially. This process, along with the breakdown in the system of animacy classifiers, some of which became agreement markers, also led to the rise of what could be called "lexical

inflection"[7] – the idiosyncratic choice of agreement marker configuration. The discussion below concentrates on the shift of the root position from end to beginning, the central typological change that was triggered by accommodation to the suffixing verb paradigms of other Inner Eurasian languages.

A comparison of verb structure across Yeniseic demonstrates that the Proto-Yeniseic verb was exclusively prefixing, with the root, or base, always in final position. Vajda (in press 2) reconstructs the following position class model:

(*) *Proto-Yeniseic finite verb morphology*

morphemes outside the phonological verb		P4	P3	P2	P1	**verb base** (bare root or verb-deriving prefix *d, l* + root)
subject NP	verbal complement (adverb, object NP)	shape classifier (*d, n, h*^{w}, etc.)	animacy classifier *d* - anim. *b* - inan.	tense, mood, aspect (originally auxiliary verb *s, ɣa, o* + suffix *l, n*)	undergoer subject agreement (1 or 2 p)	

In contrast to this prefixing structure, every one of the more than two dozen productive patterns of finite verb creation in Modern Ket place a lexical stem at the beginning of the phonological verb. In most of these models, an infinitive form occupies slot 7, while the original root position (slot 0) has come to be filled with a morpheme that marks transitivity or aspect, derived from a semantically eroded verb root. Still, the original root position continues to be obligatorily filled in all verbs, so that it cannot simply be called a suffix. Here are a few examples:

(*) *Root-initial verb forms in Modern Ket containing the infinitive ūˑs 'thaw, warm up'*

*da=**us**qibit* 'she thaws it (once)' [*da*^{8}=***us***^{7}-*q*^{5}-*b*^{3}-*t*^{0} 3F.SBJ^{8}-**thaw**^{7}-CAUS^{5}-3N.OBJ^{3}-**MOM.TRANS**^{0}]

*da=**us**qabda* 'she thaws it (often)' [*da*^{8}=***us***^{7}-*q*^{5}-*a*^{4}-*b*^{3}-*da*^{0} 3F.SBJ^{8}-**thaw**^{7}-CAUS^{5}-3M.OBJ^{4}-**ITER.TRANS**^{0}]

*da=**us**qisatn* 'she thaws out (once)' [*da*^{8}=***us***^{7}-*q*^{5}-*s*^{4}-*a*^{1}-*tn*^{0} 3F.SBJ^{8}-**thaw**^{7}-CAUS^{5}- PRES^{4}-3SG.SBJ^{1}-**MOM.INTR**^{0}]

*da=**us**qajarij* 'she thaws out (often)' [*da*^{8}=***us***^{7}-*q*^{5}-*aj*^{4}-*a*^{1}-*dij*^{0} 3F.SBJ^{8}-**thaw**^{7}-CAUS^{5}-PRES^{4}-3SG.SBJ^{1}-**ITER.INTR**^{0}]

us**iɣaʁan* 'it begins to thaw' [us***^{7}-*i*^{5}-*k*^{5}-*a*^{4}-*qan*^{0} **thaw**^{7}-3N.SBJ^{6}-**TH**^{5}-PRES^{4}-**INCEPT**^{0}]

In productive patterns of verb formation, only word forms can occupy P7, though these words may contain suffixes marking event or participant number:

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[7] This term was first introduced by Ruth Singer (2006), who described lexical, stem-building uses of agreement morphemes in the Australian language Mawng, a feature she compares typologically to Yeniseic.

(*) *Examples showing punctual and iterative suffixes on P7*

*da=**tá ʁaj**ɔ́ksa* 'she (a wasp) stings him (once)' [*da*^{8}=***taʁaj***^{7}-*o*^{6}-*k*^{5}-*s*^{4}-*a*^{0} 3F.SBJ^{8}-**sting.MOM**^{7}-3M.SBJ^{6}-PRES^{4}-action.occurs^{0}]
*da=**taqtijiŋ**ɔksa* 'she stings him (often)' [*da*^{8}=***taqtijiŋ***^{7}-*o*^{6}-*k*^{5}-*s*^{4}-*a*^{0} IC^{8}-**sting.ITER**^{7}-3M.SBJ^{6}-TH^{5}-PRES^{4}- action.occurs^{0}]

In all productive verb patterns in Modern Ket, a lexical root occupies phonological verb initial position. The position 8 subject markers located in front of this root are actually ditropic clitics (just like the possessive morphemes in nominal morphology) and normally encliticize to any available preceding word:

(*) *The phrase 'she makes an axe', showing encliticization of the subject marker*

*bu**ʁa** toksivɛt*
*bū=**da**^{8} tō·k*^{7}*-s*^{4}*-bet*^{0}
she=**3F.SBJ**^{8} axe^{7}-PRES^{4}-make^{0}
'she makes an axe'

Phonologically, most Modern Ket verbs contain an initial root, mimicking the root-initial suffixal agglutination typical for verbs in other Inner Asian languages.

The only productive patterns that retain a functional verb root in slot 0 are verbs that incorporate their patient or instrument nouns. Incorporation is an innovation in Yeniseic and fewer than a dozen verb roots allow it. Most incorporate the patient or theme: *-aq* 'become', *-bet* 'have, make', *-ej* 'kill', *-dop* 'drink', *-a* 'eat, feed on'. Two incorporate only instrument-role nouns: *-kit* 'rub with object' and *-tet* 'hit endwise with a long object'.

(*) *Noun incorporation in Modern Ket*

kɛʁ**ataq* 'he becomes a man' [kɛʔd***^{7}*-a*^{6}*-t*^{5}*-a*^{4}*-aq*^{0} **man**^{7}-3M.SBJ^{6}-TH^{5}-PRES^{4}-INCEPT^{0}]
in**ijbɛt* 'she has a needle' [iʔn***^{7}*-iʃ*^{4}*-bet*^{0} **needle**^{7}-3F.SBJ^{4}-have^{0}]
*da=**in**sivɛt* 'she makes a needle' [*da*^{8}=***iʔn***^{7}*-s*^{4}*-bet*^{0} 3F.SBJ^{8}-**needle**^{7}-make^{0}]
*da=**sɛl**sej* 'she kills a reindeer' [*da*^{8}=***sèl***^{7}*-s*^{4}*-ej*^{0} 3F.SBJ^{8}-**reindeer**^{7}-PRES^{4}-kill^{0}]
*da=**ul**arɔp* 'she drinks water' [*da*^{8}=***ūˑl***^{7}*-a*^{4}*-dop*^{0} 3F.SBJ^{8}-**water**^{7}-PRES^{4}-drink^{0}]
*da=**im**sa* 'she eats pine nuts' [*da*^{8}=***īˑm***^{7}*-s*^{4}*-a*^{0} 3F.SBJ^{8}-**pine.nuts**^{7}-PRES^{4}-eat^{0}]
*da=**don**baɣatɛt* 'she knifes me' [*da*^{8}=***doʔn***^{7}*-ba*^{6}*-h*^{5}*-a*^{4}*-tet*^{0} 3F.SBJ^{8}-**knife**^{7}-1SG.OBJ^{6}-TH^{5}-PRES^{4}-hit^{0}]
*da=**tʌɣ**aŋtaɣit* 'she salts them (fish)' [*da*^{8}=***tʌ***$^{?7}$*-aŋ*^{6}*-t*^{5}*-a*^{4}*-kit*^{0} 3F.SBJ^{8}-**salt**^{7}-3PL.ANIM.OBJ^{6}-TH^{5}-PRES^{4}-rub^{0}]

These incorporation patterns are connected with the rise of root-initial verb forms. Noun phrases containing free modifiers cannot be incorporated. Plural nouns, being word forms, can be incorporated, however:

(*) *Singular and plural noun forms in P7*

*t=**qus**sivɛt* 'he makes a tent' [*du*^{8}-***qu***$^{?}$***s***^{7}-*s*^{4}-***bet***^{0} 3M.SBJ^{8}-**tent**^{7}-PRES^{4}-make^{0}]
*t=**quŋ**sivɛt* 'he makes tents' [*du*^{8}-***qu***$^{?}$***ŋ***^{7}-*s*^{4}-***bet***^{0} 3M.SBJ^{8}-**tents**^{7}-PRES^{4}-make^{0}]
qus**divɛt* 'I have a tent' [qu***$^{?}$***s***^{7}-*di*^{1}-***bet***^{0} **tent**^{7}-1SG.SBJ^{1}-have^{0}]
quŋ**divɛt* 'I have tents' [qu***$^{?}$***ŋ***^{7}-*di*^{1}-***bet***^{0} **tents**^{7}-1SG.SBJ^{1}-have^{0}]
kɛ**ratɔnɔq* 'he became a man' [kɛ***$^{?}$***t***^{7}-*a*^{6}-*t*^{5}-*o*^{4}-*n*^{2}-*oq*^{0} **man**^{7}-3M.SBJ^{6}-TH^{5}-PAST$^{4/2}$-INCEPT^{0}]
dɛŋ**aŋtɔnɔq* 'they became men' [dɛ***$^{?}$***ŋ***^{7}-*aŋ*^{6}-*t*^{5}-*o*^{4}-*n*^{2}-*oq*^{0} **men**^{7}-3AN.PL.SBJ^{6}-TH^{5}-PAST$^{4/2}$-INCEPT^{0}]

Once again, the placement of an easily recognizable root or stem in phonological verb-initial position approximates a suffixing structure.

An examination of the oldest verbs in Ket reveals that most of the language's basic word stock are exclusively prefixing and root final. This suggests that root-initial verb formations, which now represent the only productive patterns in Modern Ket, arose only later, on the basis of an original prefixing configuration of morpheme position classes.

(*) *Root-final verbs in the oldest layer of Ket vocabulary*

*duɣa**raq*** 'he lives' [*du*^{8}-*ɣa*^{4}-***daq***^{0} 3M.SBJ^{8}-PRES^{4}-**live**^{0}]
*dɔl**daq*** 'he lived' [*du*^{8}-*o*^{4}-*l*^{2}-***daq***^{0} 3M.SBJ^{8}-PAST$^{4/2}$-**live**^{0}]
*dup**taŋ*** 'he drags it' [*du*^{8}-*b*^{3}-***taŋ***^{0} 3M.SBJ^{8}-3N.OBJ^{3}-**drag**^{0}]
*dɔbil**taŋ*** 'he dragged it' [*du*^{8}-*o*^{4}-*b*^{3}-*l*^{2}-***taŋ***^{0} 3M.SBJ^{8}-PAST$^{4/2}$-3N.OBJ^{3}-**drag**^{0}]
*dup**tɛt*** 'he hits it' [*du*^{8}-*b*^{3}-***tet***^{0} 3M.SBJ^{8}-3N.OBJ^{3}-**hit**^{0}]
*dib**bɛt*** 'he makes it' [*du*^{8}-*b*^{3}-***bet***^{0} 3M.SBJ^{8}-3N.OBJ^{3}-**make**^{0}]

Note also that the position 8 subject markers in root-final verbs are regular prefixes, forming part of the phonological verb. This contrasts with their behavior in stems with initial roots, before which these subject markers encliticize to the previous word whenever possible, insuring root-initial pronunciation of the verb in most cases.

The verbs in all documented Yeniseic languages show the same tendency for the semantic peak to migrate from final to initial position, with only the oldest layer of vocabulary consistently retaining the original root-final, prefixing structure. Root-final verbs play a core lexical role in Yeniseic similar to strong verbs in Germanic.

External comparison with Na-Dene languages provides additional evidence that the Yeniseic verb was originally prefixing. Much of the prefixing structure of Proto-Yeniseic appears cognate with the oldest layers of Tlingit, Eyak, and Athabaskan verb morphology. Although no one has yet reconstructed the Proto-Athabaskan verb, let alone that of Proto-Na-Dene, there are many obvious parallels with Yeniseic. These include the use of shape classifying consonants in both Yeniseic and Athabaskan: *d* for long shape, *n* for round shape, and h^{w} for a flat surface (cf. Athabaskan *d, n, qu* with the same meanings).

(*) *Ket and Kott verb stems with shape and animacy classifying prefixes*

Ket: -***d-a-b-do*** 'subject cuts, hews a long rigid object, such as a log'
-**LONG**-PRES-3N.OBJ-cut -***a-b-do*** 'cut (object shape unspecified)'

Kott: -***dʲ-a-tʰex*** 'subject hits with long object, such as a whip'
-**LONG**-PRES-hit (cf: Kott -***a-tʰex*** 'hit (object shape unspecified)'

Kott: -***dʲ-a-gič*** 'subject rows (< turns long rigid object')
-**LONG**-PRES-twist (cf: Ket ***hʉ̀s*** 'twisted')

Ket: -***n-a-b-gil*** 'subject cuts it around the edges' (e.g., uneven edges off birchbark or rawhide)
-**AROUND**-PRES-3N.OBJ-cut

Ket: -***n-a-b-i*** 'subject brushes away snow from around an object'
-**AROUND**-PRES-3N.OBJ-brush

Ket: -***h-a-b-daq*** 'subject propels an object at a target'
1SG.SBJ-**FLAT.AREA**-PRES-3N.OBJ-propel

Ket: -***h-a-b-daqŋ*** 'subject glues, sticks object onto a surface'
1SG.SBJ-**FLAT.AREA**-PRES-3N.OBJ-stick

Ket: -***h-u-l-tes*** 'subject stood up', Yugh ***f-u-l-tes*** 'subject stood up'
1SG.SBJ-**FLAT.AREA**-PAST-occupy.from.above
(/**u**/ after /h/ or /f/ is a vestige of original labialization *h^w)

Kott: ***dʲ-a-fel,*** 'he/she grows' VS. ***b-a-fel,*** 'it grows'
ANIM-PRES-grow **INAN**-PRES-grow

The morpheme positions of shape-classifying consonants, animacy classifiers, conjugation markers (originally auxiliary verbs), and 1st and 2nd person subject agreement prefixes are generally identical in Yeniseic and Athabaskan.

Two striking differences in verb morphology likewise have explanations. Na-Dene languages are famous for their system of pre-root "classifier" prefixes. In Modern Athabaskan these include *d* used for transitivity lowering and *ɬ* for transitivity raising of various sorts. Proto-Yeniseic apparently possessed a *d*-prefix that converted body part nouns into verb. Vestiges of this in Modern Ket include many verb roots with initial *d*: *dàχ* 'laugh', *dàm* 'bark', *dɪ̄s* 'scold', -*dop* 'drink', etc. In some instances, Ket contains doublet stems, such as *in* 'light' vs. *dī·n* 'emit light'; *ī·t* 'a smell' vs. *dī·t* 'to smell', and possibly *ū·p* 'opening, burrow' vs. Ket -*dop* 'drink', that suggest the initial *d*- was a prefix. Proto-Yeniseic also possessed a second verbalizing prefix, preserved as verb-base initial *lʲ* in Arin, *χ* in Yugh, *q* in Ket – used to derive action verbs from stative verbs: Arin -*lʲon* 'look, watch'; Yugh -*oŋ* 'see', -*χoŋ* 'watch, look'. Vajda (2006b) proposed that these consonants are cognate with the Athabaskan classifiers and that the system of Na-Dene transitivity marking "classifiers" developed out of verb-deriving prefixes that originally did not interact as a system to mark lexical differences in transitivity. In Yeniseic these morphemes did not evolve into a productive grammatical system. On the Na-Dene side, their origin from verb deriving prefixes might explain anomalous instances where these morphemes are not associated with transitivity raising or lowering. The most striking example is the *d*-classifier found in transitive verbs meaning 'to drink' – an ancient

feature represented across Na-Dene. The original use of the *d*-prefix to create verbs denoting actions performed without the aid of an external instrument – including actions performed by the subject's own body part – might explain why it evolved into a valence-lowering device in Na-Dene, since it already signaled that agent and instrument were naturally one.

The other classic feature of the Na-Dene verb that at first glance seems entirely missing from Yeniseic is the ancient system of verb-final tense-aspect-mood suffixes, which includes *ɬ* for future progressive and n^j for perfective meaning. In Modern Athabaskan these elements have fused after the verb root, forming allomorphic stem sets (Leer 1979). These interact with the conjugation prefixes located directly before the 1st and 2nd person subject markers, forming the various grammatical distinctions in tense, mood and aspect. Modern Navajo provides an illustration:

(*) *Morpheme position classes in the Modern Navajo verb*

10-7	**6**	**5**	**4**	**3**	**2**	**1**	**0**
disjunct prefix slots	direct object	3rd person subject	conson-antal lexical prefixes	**conjugation marker** (interacts lexically with verb stem allomorphs to express grammatical tense, mood distinctions)	1st, 2nd subject	"classifier" (valence prefix: Ø, *d*, *l*, *ɬ*)	**verb "stem"** (fusion of root + TAM suffix: *ɬ*, n^j, etc.)
	conjunct prefixes			**conjugation/subject portmanteau**		**classifier + stem**	

There is no evidence for verb-final suffixes in Proto-Yeniseic, and the Ket verb base lacks suffix-induced allomorphs conveying tense-mood-aspect distinctions. However, the same elements that appear as verb-final suffixes in Athabaskan appear to have been suffixed in Yeniseic to the auxiliary verb (homologous with the Modern Athabaskan conjugation prefix), so that they show up as prefixes rather than suffixes in the Yeniseic verb form as a whole. As mentioned above, Modern Ket contains six lexical tense-mood-aspect combinations of the position-4 auxiliary verb (*ya, o, s*) and the original aspectual suffix (*l, n*) still found in prefix position 2. These morphemes are adjacent in Yugh and Kott, but were separated in Ket verb forms with an inanimate-class marker *b*, which migrated from the thematic consonant slot (P5) to Modern Ket position 3. The aspect-related distinctions expressed in Modern Ket by *l* and *n* are highly lexicalized and appear only in past tense and imperative forms:

(*) *Example of aspectual distinctions in the past tense and imperative forms of Modern Ket verb stems meaning 'hit endwise using a long object'*[8]

[8] The inanimate-class object marker *b*, which now stands between what used to be the auxiliary verb (slot 4) and its aspectual suffix (position 2), was originally part of the animacy classifying system located to the left of the auxiliary. This object marker does not show up in stems that use the contrasting animacy classifier *d*. In such stems, absence of the animacy classifier is sufficient to signal inanimate-class agreement; hence the lack of object marker in verbs meaning 'break a long object'. Animacy classifier *d* is only found in a few stems (Vajda 2003) where it appears to the left of both tense-mood markers in the original classifier position: ***t=hadontet*** 'he broke it (animate-class tree)', ***t=hantet*** 'he broke it (inanimate-

-*aptet* 'hits it' [a^4-b^3-tet^0 -PRES^4-3N.OBJ^3-hit^0]
-*bintet* 'hit it (once)' [b^3-n^2-tet^0 -3N.OBJ^3-PAST^2-hit^0]
-*obiltet* 'hit it (iterative)' [o^4-b^3-l^2-tet^0 -PAST$^{4/2}$-3N.OBJ^3-hit^0]
-*ntet* 'Hit it! (once)' [n^2-tet^0 -IMP^2-hit^0]
-*ltet* 'Hit it! (iterative)' [a^4-l^2-tet^0 -IMP$^{4/2}$-hit^0]

(*) *Example of aspectual distinctions in past tense forms of Modern Ket verbs meaning 'break a long rigid object'*

t=hastet 'he breaks it' [du^8=ha^7-s^4-tet^0 3M.SBJ^8-perpendicular^7-PRES^4-hit^0]
t=hantet 'he broke it (once)' [du^8=ha^7-n^2-tet^0 3M.SBJ^8-perpendicular^7-PAST^2-hit^0]
t=haltet 'he broke them (iterative)' [du^8=ha^7-l^2-tet^0 3M.SBJ^8-perpendicular^7-PAST^2-hit^0]
hantet 'Break it (once)' [ha^7-n^2-tet^0 perpendicular^7-IMP^2-hit^0]
haltet 'Break them (iterative)' [ha^7-l^2-tet^0 perpendicular^7-IMP^2-hit^0]

Morphological parallels with Na-Dene thus provide additional confirmation that Yeniseic was originally prefixing and later underwent a partial re-adaptation to resemble the suffixing verb morphology of other Inner Eurasian languages. Cross-Yeniseic comparisons, as well as an examination of productive and unproductive verb creation patterns in Modern Ket likewise point unmistakably to a partial shift from prefixation to suffixation. This process left mostly intact the relative order of the oldest position classes. But it also added new subject/object marker positions, creating one of the most bizarre morphological entities found anywhere on earth – the Ket finite verb.

6 Conclusions

Developments in the verb morphologies of Ket and other Yeniseic languages could be summed up as attempts to accommodate a prefixing morphology toward a suffixing model by innovating a new root position at the phonological verb's rightmost edge. The rise of ditropic clitics from possessive prefixes and verb-initial subject prefixes is also connected with the tendency to imitate a general root + suffix pattern . The resulting hybrid morphological typology of Yeniseic strongly imitates the suffixal agglutination common to Inner Eurasia, while nevertheless preserving intact original features such as the relative position of affixes in the verb template, or tonal distinctions in the noun root. I have applied the term "typological accommodation," to instances where original phonological, morphological, or grammatical traits become adapted in partial mimicry of a radically different language type. Yeniseic provides a rare and fascinating example of what can happen when a strongly prefixing morphology with syllabic tones similar in many ways to modern Athabaskan or Tlingit is subjected to prolonged areal influence from exclusively suffixing, toneless languages. This influence is all the more interesting in light of the conservative sociolinguistic attitudes toward borrowing maintained by

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class stick)'. The inanimate-class object marker *b* also regularly deletes as part of the rule of imperative formation, which explains its absence in forms meaning 'Hit it!'.

Yeniseic peoples, who as small and isolated bands of hunter-gatherers spoke languages not shared by the surrounding peoples.

Much less unusual from a cross-linguistic perspective is how Yeniseic languages ultimately came to be supplanted by the languages of Inner Eurasia's food producers – stockbreeding Turk and Mongols, the reindeer-herding Ugrians, Evenki, and Samoyedic peoples, and finally the Russians. The elimination of hunter-gatherer languages due to the inexorable and rarely reversed spread of farmers and pastoralists has its beginnings in the earliest Neolithic at least ten thousand years ago. In the case of Yeniseic, as in most similar scenarios, the incoming languages borrowed only a limited number of vocabulary items, with toponyms being the most widespread and enduring form of substrate influence. The unique phonological and grammatical patterns inherent to the hunter-gatherer languages, on the other hand, were in most cases almost entirely submerged. This is definitely true across western and central Siberia in the case of the once widespread Yeniseic family.

It is interesting to speculate about the social mechanisms whereby the surviving Yeniseic languages gradually accommodated themselves to the phonology and grammar of their food-producing neighbors during millennia of contact. This process, which produced a unique hybrid morphological typology rather than more wholesale typological replacement (metatypy), probably began during the earliest spread of animal husbandry into south Siberia. The acquisition of a case-like system of nominal relational morphemes and a root-initial phonological verb word is most likely to have begun during the late Scythian or Hunnic periods, over 2000 years ago. This is the probable time for the dispersal of Yeniseic daughter languages. Evidence of incipient typological accommodation is already evident in Common Yeniseic.

A final interesting aspect of Ket sociolinguistic history is the perennial resistance of its speakers to borrowing words and morphemes outright. This tendency can still be seen among the last speakers of Modern Ket today. Linguistic conservatism may yet provide another reason why Yeniseic speakers only partly assimilated outside typological patterns during centuries of one-sided Ket-Turkic and Ket-Samoyedic bilingualism.

Abbreviations

ABL – ablative enclitic
AC – animacy classifier
ADESS – adessive enclitic
ANIM, or AN – animate class
APPL – applicative infix in verbs (specifies the action involves a tool or means of conveyance)
BEN – benefactive enclitic
CAR – caritive enclitic (denotes lack or absence)
CAUS – causative affix
FEM, or F – feminine class (a subset of animate class)
CAR – caritive enclitic (denotes lack or absence)
IC – involuntary causative (fossilized agreement marker used to reduce transitivity)
IMP – imperative mood
INSTR – instrumental enclitic (also conveys comitative meaning)
INTR – intransitive
ITER – iterative
LOC – locative enclitic
MASC, or M – masculine class (a subset of animate class)

MOM – punctual, momentaneous, or single-event verb
N – neuter (=inanimate) class; either singular or plural
NMLR – nominalizing suffix (converts other word forms into nouns)
OBJ – verb-internal direct object agreement affix
PL – plural
POSS – possessive clitic
PRED – predicate concord suffix (converts most words except uninflected nouns into predicate nominals)
PAST – past tense
PRES – present (or future) tense
PROS – prosecutive enclitic
RES – resultative marker in verbs (denoting a state caused by a previous action)
SG – singular
SMLF – semelfactive (instantaneous action)
SBJ – verb-internal subject agreement affix
TH – thematic consonant (rarely, two consonants) appearing in P5 in more than half of all Ket verbs
TRAN – transitive
VOC - vocative suffix

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