

Materials for a Comparative Grammar  
of the Dene-Caucasian Languages

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The Dene-Caucasian language family (or macro-family) is defined here as including the following language families: **Basque; Caucasian; Burushaski; Sino-Tibetan; Yeniseian; and Na-Dene.**<sup>1</sup>

I. Phonology

Thanks to the pioneering work of Starostin (1982, 1984, et seq.) and Nikolayev (1991), we can deduce some of the features of the DC phonological system. There was a threefold contrast of stops and other occlusives: (1) voiceless (aspirated): **T<sup>(h)</sup>**; (2) (voiceless) glottalized: **T'**; and (3) voiced **D**. This pattern is best preserved in Caucasian and Na-Dene languages, and in Burushaski (where, however, the contrast is **T<sup>h</sup> : T : D**). In Basque the aspirated and glottalized forms have merged, leaving a twofold contrast: **T<sup>(h)</sup> : D**.<sup>2</sup> In Yeniseian there is also a twofold contrast, but the laryngeal features have reversed: **T<sup>(h)</sup>** and **T'** merged as **\*d**, while **D** became **\*t** (in Starostin's Proto-Yeniseian). In Sino-Tibetan the developments have been more complicated (see the correspondences proposed by Starostin [1984, 1991]). All these patterns can be schematized as follows:

Proto-DC	T <sup>(h)</sup>	T'	D
Basque <sup>4</sup>	T <sup>(h)</sup>	T <sup>(h)</sup>	D
Caucasian	T	T'	D
Burushaski	T <sup>h</sup>	T	D
Sino-Tibetan	Th/Dh	T/D	T(h)
Yeniseian	D	D	T
Na-Dene	T	T'	D

<sup>1</sup> I have also suggested the inclusion of ancient **Sumerian** in the Dene-Caucasian family. Because of special difficulties of ancient, extinct languages, it will be omitted from the present discussion.

<sup>2</sup> In this paragraph and the following table **T<sup>(h)</sup>** stands for any voiceless (aspirated) occlusive, **T'** for any glottalized occlusive, **D** for any voiced occlusive.

<sup>3</sup> Note, however, that **\*k<sup>h</sup>** became **\*x**, then /h/, e.g. Basque **\*xa(u)ndi** > (h)andi ~ aundi 'great', corresponding to Circassian **\*k<sup>hw</sup>a(n)də** 'much, many'.

<sup>4</sup> In Standard Basque there is only the contrast **t : d**. Some Basque dialects now have a threefold contrast (**th : t : d**) that appears to be secondary, due to loanwords from Romance languages.

Proto-Dene-Caucasian probably had at least eight series of occlusives:

Labial	*p	(*p') <sup>5</sup>	*b
Dental (stop)	*t	*t'	*d
Dental (affricate)	*c = *ts	*c' = *ts'	*ʒ = *dz
Palatal	*č	*č'	*ʒ̣
Lateral <sup>6</sup>	*λ	*λ'	*λ
Velar	*k	*k'	*g
Uvular	*q	*q'	*G
Laryngeal		*ʔ	

This system is retained almost intact in Proto-Caucasian and Proto-Na-Dene.<sup>7</sup> In Burushaski the uvular series is retained, the lateral affricate series has been lost (replaced by stops and clusters: see below), and the retroflex series (**t<sup>h</sup> ṭ ḍ**) has been added (under influence of the South Asian *Sprachbund*). In all the other families the original system has been more extensively reshaped. For Basque see Bengtson (1995, 1997 ms.); for Sino-Tibetan see Peiros & Starostin 1996); for Yeniseian see Starostin (1982, 1995). For some examples of the above proto-phonemes and their reflexes:<sup>8</sup>

PDC **\*p**:

- Basque *ip(h)urdi*<sup>9</sup> ~ *epurdi* ~ *eperdi* 'rump, buttocks' ~ Bezhta *pirt'i* 'bladder, lung', etc. (NCED 871) ~ Burushaski (Y) *phaʔ* 'gizzard; stomach (of fowl)' ~ PST *\*Pat* > Burmese *phat* 'to vomit', etc. (ST I: 98) ~ Na-Dene: Eyak *wət* 'vomit'; PAth *\*wət* > Navajo *-bid* 'belly', etc.
- Basque *ep(h)el* 'lukewarm, tepid' ~ Yen: Kott *phal* ~ *fal*, Assan *pfól-tu* ~ *pal-tu* 'hot, warm' (cf. PY *\*ʔapV* SSEJ 182)
- PEC *\*pōrV* > Chechen *polla* 'butterfly', Tindi *pera* 'bee', etc. (NCED 875) ~ Burushaski (H,N) *phirán* 'spider', (Y) *pherán* 'moth'
- PNC *\*pīncwǎ* 'resin, juice' > Dargwa *penc* 'resin', Lak *pic* 'dew, sweat', etc. (NCED 871) ~ Burushaski *phunc* 'dew' ~ PY *\*piʔt* 'glue' (SSEJ 249)

<sup>5</sup> [p'] is typologically unusual, even in languages that have [t'] and other glottalized consonants, so possibly it did not exist in PDC.

<sup>6</sup> The symbols **\*λ**, **\*λ'**, **\*λ** stand for the lateral affricates otherwise transcribed as [ṭ], [ṭ'] and [ḍ], respectively.

<sup>7</sup> In Na-Dene languages the PDC labial series is reduced, all labial consonants (\*p, \*b, \*w, \*m) tending to merge into the same phoneme: usually /w/ in Tlingit, /b/ in Navajo, etc. (Bengtson 1994)

<sup>8</sup> Due to lexical attrition in this very old language family, it is not always possible to present etymologies in which cognates from every DC family are represented. However, we have sought to choose etymologies that represent the family as widely as possible.

<sup>9</sup> Here, *et passim*, the symbols (h), p(h), t(h), k(h), l(h), etc. refer to the aspiration absent in some dialects and standard Basque, but present in northeastern dialects of Basque. For example, 'snow' is *elur* in standard Basque, but *elhur* or *elhür* in northeastern dialects (cf. Hualde 1991; Trask 1997: 157-163).

PDC \*b:

- Basque *bi(h)ar* ~ *bigar* ‘tomorrow’ ~ Rutul *biga* ‘tomorrow’, etc. < PEC \**bægə* ‘morning, evening’ (NCED 292) ~ PY \**pVk-* ‘morning’ > Ket *hígem*, etc. (SSEJ 254)
- Basque *belar* (*bela-r*) ‘forehead’ ~ Rutul *bäl* ‘forehead’, Tindi *bala* ‘edge, end, corner’, etc. < PEC \**bʃäthö* (NCED 285) ~ Burushaski *bal* ‘wall’ ~ ST: Tibetan *dpral* ‘forehead’ (< \**d-r-pal?*)
- PEC \**bĩmʃV* > Avar *mal* ‘foot’, Tsez *bula* ‘hoof’, etc. (NCED 307) ~ Burushaski \**bumbla-* in (Y) *bũmba-lten* ‘ankle’ ~ PST \**phöl* > Tibetan *bol* ‘upper part of foot’, etc. (ST I: 78) ~ PY \**bul* > Ket *būʔ* ‘foot’, etc. (SSEJ 213)
- PST \**pāk* > Old Chinese \**pāk* ‘wide, ample’, etc. (ST I: 50) ~ Na-Dene: Tlingit *wuq* ‘wide, broad’, Eyak *wəχ* ‘wide, broad’

PDC \*t:

- Basque *t(h)u* ‘to spit’, *it(h)oi* ‘drop’ ~ PEC \**twəjV* ‘spit, spittle’ (NCED 994) ~ Burushaski *thu* ‘to spit’ ~ PST \**thōj* ‘spit’, \**thok* ‘saliva’ (ST II: 163, 164) ~ PY \**duK* > Kott *tuk* ‘saliva’ (SSEJ 224) ~ Na-Dene: Tlingit *tux* ‘to spit’
- Basque *t(h)ini* ‘summit, top’ ~ Burushaski *-thán* ‘point, summit, peak’ ~ PST \**tēpH* ‘top’ > Tibetan *s-teŋ*, etc. (ST II: 121)
- PEC \**türV* ‘dung, mud’ > Akhwakh *tereti* ‘ashes, dust’, etc. (NCED 993) ~ Burushaski *ther* ‘dirt’ ~ PY \**dəʔəɾi* ‘powder, dirt’ > Kott *taran* ‘dirt’, etc. (SSEJ 220)
- PST \**dhāw* > Old Chinese \**thāw* ‘eat voraciously’, etc. (ST II: 7); cf. Lepcha *tha* ‘to eat’ ~ Na-Dene: Haida *táa-* ‘to eat’; Path \**ta-n-* > Kato *-tan* ‘eat’, etc.

PDC \*tʰ:

- Basque *it(h)ain* ‘tick’ ~ PNC \**taHnā* ‘nit’ > Akhwakh *tʰani*, etc. (NCED 995)
- Basque *izter* (*i-z-te-r*)<sup>10</sup> ‘thigh’ ~ Avar *hetʰ é / hetʰ* ‘foot’, etc. < PEC \**tʰwĩV* ~ \**fiwĩV* (NCED 1007) ~ Burushaski *-út* ~ *-úʔis* ~ *-húʔes* ‘foot’ ~ PST \**təH* > Old Chinese \**təʔ* ‘foot, heel’ (ST II: 123) ~ Na-Dene: Haida *s-tʰáay*, *s-tʰa-* ‘foot’, *tʰaa-* ‘to step’; Sarsi *-tʰás*, *-tʰáz* ‘to move one’s own foot’, etc.
- PNC \**tũmhV* > Chechen *tʰum* ‘kernel (of fruit, nut); marrow’, etc. (NCED 1004) ~ Burushaski (H,N) *tumá* ▶ ‘nutshell, stone (of fruit)’, (Y) *tumá* ‘shell (of nut, egg), fruit stone’ ~ PST \**tjũmH* ‘seed, fruit kernel’ (ST II: 147)
- PNC \**tʃāmV* ‘wing’ > Lak *tʰimu* ‘feather’, etc. (NCED 995) ~ Na-Dene: Haida *tʰáaʔwun* ‘feather, plume’; Tlingit *tʰàw* ‘long feather’; Eyak *tʰah-ʔ* ‘feather, leaf’; Navajo *tʰá*, *-tʰàʔ* ‘feather’, etc.

PDC \*d:

- Basque *odol* (*o-dol*) ‘blood’ ~ PST \**t(h)əʔlH* ‘meat, flesh’ > Lushai *tāl* ‘flesh, muscle’, etc. (ST II: 158) ~ Na-Dene: Eyak *deʔ* ‘blood’; Chipewyan *dét*, Navajo *dìʔ* ‘blood’, etc.<sup>11</sup>
- Basque *udagara* (*u-dagara*)<sup>12</sup> ‘otter’ ~ PEC \**darqʷV* > Andi *dargʷa* ‘weasel, marten’, Lak *t:arqʷa* ‘weasel, ermine’ (NCED 399) ~ PY \**täχVr* ‘otter’ > Ket *ta:ʔ*, Kott *thēgär*, etc. (SSEJ 283)
- PEC \**dānʔʔ* > Avar *da* ‘gum’, Rutul *dan* ‘cheek’, etc. (NCED 398) ~ ST: Tibetan *m-dan* ‘cheek’ ~ Na-Dene: \**dāʔ* > Eyak *daʔ* ‘face’; Hupa *-daʔ* ‘mouth, lips’, Chipewyan *-dà*, *-dá* ‘lip, beak’, Navajo *-dààʔ* ‘lip, bill’
- PNC \**dHāqʷĀ* > Rutul *daq* ‘back of head’, Ubykh *tʷəq* ‘neck’, etc. (NCED 399) ~ PST \**tūk* ‘neck’ > Garo *gi-tok*, etc. (ST II: 148) ~ PY \**tugV* > Ket *tū* ‘(upper) back’, Pumpokol *tuk* ‘back(wards)’ ~ Na-Dene: Tlingit *déχ* ‘back’, *daχ* ‘place behind one’, *-daχ* ‘from’; Navajo *dah* ‘off, down off’

PDC \*c:

- Basque *sagu* ‘mouse’ ~ PNC \**cārgwī* ‘weasel, marten, mouse’ (NCED 322) ~ Burushaski (Y)<sup>13</sup> *čargé* ‘flying squirrel’ ~ PST \**sraij(H)* ‘weasel, squirrel, mongoose’ ~ Yen: Ket *saʔq* ‘squirrel’, etc. (SSEJ 268) ~ Na-Dene: Tlingit *calg* ‘squirrel’, Eyak *cətk*, Path \**cələx* ‘squirrel’
- Basque (*h*)*osin* ‘deep place in a river; (dial.) well’ ~ Tindi *hinc:i* ‘spring’, etc. < PEC \**ʔwāncV* < \**wāncV* ‘well, spring’ (NCED 232) ~ PST \**cējH* > Old Chinese \**ceŋʔ* ‘well’, etc. (ST IV: 3) ~ PY \**sin-* > Kott *šinaj* ‘spring’, etc. (SSEJ 274)
- Basque *itsu* ‘blind’ (~ dial. *utsü* ~ *utsi*, etc.) ~ PEC \*=*VcV* > Tindi =*ec:u-b* ‘blind’, Khwarshi *sajsu* ‘dark’, etc. (NCED 1017) ~ Na-Dene: Mattole *-coi* ‘to be blind’
- PNC \**cōjwĩhV* > Tindi *c:ibar* ‘winter’, Khinalug *cuwa-ž* ‘autumn’, etc. (NCED 327) ~ ST: Old Chinese \**čiw* ‘autumn’ ~ PY \**sirj-* > Ket *šīʔi* ‘summer’, etc. (SSEJ 275)

PDC \*cʰ:

- Basque *zamar* (*zama-r*) ‘fleece’ ~ PEC \**čfiwěme* ‘eyebrow’ > Lezgi *r-cʰam*, etc. (NCED 364) ~ Burushaski *še* (< \**šě*) ‘wool’, pl. *šemiŋ* ~ PST \**chām* ‘hair (of head)’ > Garo *mik-sam* ‘eyebrow’, Kanauri *cam* ‘wool, fleece’, etc. (ST IV: 19) ~

<sup>11</sup> The semantic connection ‘blood ~ flesh’ is well known: cf. Russian *êðĩãũ* ‘blood’ ~ Greek *κρέας* ‘flesh’.

<sup>12</sup> This is probably the oldest variant (others being *ugadara* and the folk-etymologized *ugabere* ‘water animal’). *u-* is either (*h*)*ur-* ‘water’ or, more likely, a fossilized class prefix.

<sup>13</sup> Burushaski dialects are indicated as (Y) Yasin = Werchikwar, (H) Hunza, (N) Nager.

<sup>10</sup> The elements *i-*, *-z-*, *-r* will be discussed below in the grammatical section.

Yen: PY \*cəpe 'hair' > Kott *heŋai*, etc. (SSEJ 213) ~ Na-Dene \*c'V̄(χ) > Tlingit *s'ì* 'eyebrow'; Eyak *c'āχ* 'eyebrow'

- Basque (c) *zur* ~ (B)<sup>14</sup> *zul* 'wood' ~ PEC \*čwřfiV̄ > Avar *c'ul* 'wood, firewood', etc. (NCED 374) ~ Burushaski (Y) *šulú*, (H,N) *šuu* 'driftwood' ~ PST \*Cəl̄ > Tibetan *chal* 'wood, grove', etc. (ST IV: 65)
- PEC \*Hčwěj̄m̄ 'leg bone' > Lezgi *c'um* 'shin bone', etc. (NCED 555) ~ Burushaski -*šánj* 'limbs, body parts' ~ Na-Dene: PAth \*c'an 'bone' > Hupa *c'an*, Navajo *c'in*, etc.; Eyak *c'əl* 'bone'

PDC \*ž:

- Basque *zuzen* 'straight, correct, true, just' ~ PNC \*HǎžĚm > Chechen *c'ena* 'clean, pure', Abaza b-*zi* 'good', etc. (NCED 552) ~ Burushaski *sisín-* to be clear (of wine, water), *sisín-*um 'clear (water); slender (person); soft (voice)' ~ PST \*chiaŋ > Tibetan *chaŋ-s* 'purified, clean', etc. (ST IV: 26)
- Basque *zelai* 'plain' ~ PEC \*žəlV > Avar *c':or* 'plain', etc. (NCED 1092)
- Basque *zor(h)i* ~ (B) *zoli* 'fortune, luck; to mature, ripen' ~ PNC \*žōfV > Lak *c'ullu-* 'healthy, whole'; Hurrian *šawlā* 'health, prosperity', etc. (NCED 1095)
- PEC \*žōnʔū 'navel' > Chechen *c'onga*, Khinalug *c'um*, Dargwa *zu*, etc. (NCED 1096) ~ Burushaski (Y) -*sú*, pl. -*súmu* ~ (H,N) -*súi*, pl. -*súimuc* 'navel, umbilical cord' ~ Na-Dene: Eyak *c'a?* 'umbilical cord'; Navajo *c'ée?* 'navel', etc.

PDC \*č:

- Basque *sorho* ~ (B) *solo* 'meadow, field' ~ PEC \*čHǎtu > Lak *šqlu* 'earth, ground', etc. (NCED 342)
- Basque *sare* ~ (B) *sale* 'net, grate; stockade' ~ Avar *čalí* 'fence' < PEC \*čhatē (NCED 343) ~ PY \*čol- > Ket *tōA* 'wicker hurdle' (SSEJ 287)
- Burushaski *čhayúr-*um 'cold, coldness' ~ PEC \*čōwqf̄ > Udi *čax* 'cold, ice', etc. (NCED 346) ~ PY \*čəG- 'icy crust on snow' > Kott *šāk, šā, šāg*, etc. (SSEJ 216)
- Burushaski *čhiš* 'mountain, hill' ~ PEC \*čāčwV<sup>15</sup> > Dargwa *čiči-k*'an 'small stone', etc. (NCED 382) ~ PY \*čif̄s 'stone' (SSEJ 217) ~ Na-Dene: Eyak *čič* 'beach, sand bank, gravel bank, sand, gravel'

PDC \*č':

- Basque *txori* [čori] ~ *xori* [šori] 'bird'<sup>16</sup> ~ Chamalal *č'or* 'bird', etc. < PEC \*čHwīlV (NCED 388) ~ ST: Tibetan m-*čhil*-pa 'sparrow' ~ PY \*čVčilV 'bird' > Kott *nenā-šili*, etc. (SSEJ 204)

<sup>14</sup> Basque dialects are indicated as (c) Common/Standard Basque, (AN) Alto Navarro, (B) Bizkaia, (BN) Behe Nafarroa = Basse Navarre, (G) Gipuzkoa, (L) Lapurdi, (R) Roncalés, (Z) Zuberoa = Souletin.

<sup>15</sup> PEC \*čāčwV (assimilated) < \*čāčwV?

- Basque (BN,Z) *txainku* [čájŋkü] ~ (BN,L) *xanku* [šanku] 'lame' ~ PEC \*čānkV > Rutul, Tsakhur *č'ank* 'trap'<sup>17</sup> (NCED 384) ~ Burushaski *čangú* ~ *čangú* 'lame, crippled'
- PEC \*čwfiēli > Avar *č':wad* 'ash tree', Rutul *č'ul* 'willow' (NCED 394) ~ PST \*čV̄ 'a kind of bamboo' > Lushai *čāl*, etc. (ST IV: 56) ~ Na-Dene: Tlingit *č'áal* 'willow'
- Basque *asko* 'much', *aski* 'enough' ~ Kabardian -š<sup>w</sup>a 'big', Lak *č'q-u* 'many', etc. < PNC \*čHəqV (NCED 386) ~ Burushaski (Y) *čik* ~ *čiq* 'all, altogether' ~ PST \*čōk 'enough' > Tibetan *čhog*, etc. (ST IV: 52) ~ Na-Dene: PAth \*čuHq > Sarsi -*čóó*, *čòòk* 'big', Beaver -*čüik* 'big', etc.<sup>18</sup>

PDC \*ž:

- Basque (R) *atze* 'tree', (BN,Z) -*tze* (suffix in tree names) ~ PNC \*Hǎ(r)žwī > Karata *ežela* 'pine tree', Khwarshi *aža* 'tree', etc. (NCED 549) ~ Yen: Ket *ži?e* ~ *di?e* 'tree trunk', Kott *či*
- Basque (c) *zumar* 'elm', (G) *zumaldi* 'grove' ~ PEC \*žhūmV > Hunzib *šumal* 'bushes', Lezgi *žum* 'quince', etc. (NCED 1107) ~ Burushaski *juú* ~ *ju* (< \*žū < \*žum-) 'apricot'<sup>19</sup> ~ PY \*[ž]am- 'berry' > Kott *čamar* šulpi 'cranberries', etc. (SSEJ 308)
- PEC \*žīV > Tsez *želi* 'wattle fence', etc. (NCED 1108) ~ Burushaski (H,N) *joóli* 'milk filter woven out of twigs'

PDC \*ž:

- Basque (Z) *limuri* 'humid' ~ PEC \*žHwemV 'liquid' (NCED 768) ~ PST \*žūm 'deep, sink' (ST III: 79) ~ Na-Dene: PEA \*že?χ > Navajo -*žèèh*, *žéé?* 'wet object moves', etc.
- Basque *adar* (*a-dar* < \**a-rđar*) 'horn' ~ Avar *ž:ar* 'horn', etc. < PEC \*žwřrV (NCED 771) ~ Burushaski (H) -*ltúr* 'horn'
- PEC \*žwV-n > Avar *ž:u-t-* 'to run (away)', etc. (NCED 639) ~ PST \*žāj(H) 'to run, gallop' (ST II: 56) ~ Na-Dene: PAth \*žā-χ(d) > Chipewyan -*žà*, -*žá*, -*žà* 'to move fast, run', etc.
- PEC \*žVžV(r) 'to crawl' > Karata *ž:or-*, etc. (NCED 224) ~ Na-Dene: Haida (Alaskan) *žuuúžuy* 'to crawl'; Tlingit *žux* 'to creep, crawl'

<sup>16</sup> We find this straightforward etymology more plausible than the convoluted derivation proposed by Michelena (see Trask 1997: 296).

<sup>17</sup> A trap cripples that which it catches.

<sup>18</sup> Note that the glottalization is on the initial affricate in PNC (č̣), but on the medial/final uvular in Na-Dene (q̣). It is difficult to tell which position is original.

<sup>19</sup> Burushaski [j] in this and the following comparison is the retroflex shushing affricate, the voiced counterpart to [c].

PDC \**ǰ*\*:

- Basque (B,G) *loki* ‘temple (of head)’ ~ PEC \**ǰarǰwě* ‘forehead; cap’ (NCED 775) ~ PST \**[ǰ]ǰek<sup>w</sup>* > Tibetan *ltag* ‘back part of the neck, nape; back’, etc. (ST III: 62) ~ Na-Dene: \**ǰ’ax* > Navajo *ǰ’ah* ‘temples’, etc.
- Basque *erdi* ‘half, middle’ ~ PNC \**ǰǰǰ* ‘half, middle’ > Bezhta =*aǰo* ‘middle’, =*aǰo*-kos ‘half’, etc. (NCED 412) ~ PST \**ǰǰǰ* ‘navel, center’ > Tibetan *lte* ‘navel, center’, etc. (ST III: 56) ~ PY \**ǰa(?)l* ‘half’ > Ket *d-aǰa*, etc. (SSEJ 178)
- PNC \**Hǰǰǰ* ‘bottom’ > Bezhta *ǰǰ’o*, Avar *t’ǰnu*, etc. (NCED 590) ~ Burushaski (H) *táno* ‘rectum’ ~ PST \**[ǰ]ǰǰ* > Lushai *thlay* ‘lower, down, west’, etc. (ST III: 30) ~ Na-Dene: Haida *s-ǰ’a-wul* ‘rectum’; Navajo *-ǰ’ááh* ‘bottom’, *-ǰ’ááh?* ‘buttocks’
- Avar *ǰ:an* ‘groin’, etc. < PEC \**ǰwVnǰV* (NCED 785) ~ Burushaski *-lten* ~ *-lten* ‘bone’ ~ Na-Dene: \**ǰ’ǰH* > Hupa *-ǰ’eh* ‘crotch’, Chipewyan *-ǰ’ǰ* ‘between the legs of’, Navajo *ǰ’ǰh*, *-ǰ’ǰh* ‘crotch’, etc.

PDC \**ǰ*\*:

- Basque *larru* ‘skin, leather’ ~ Avar *ǰ’:er* ‘color’ < PNC \**ǰǰǰ* ‘skin’ > color > paint’ (NCED 789) ~ Burushaski *tar-ǰǰ* ‘skin bag’
- Basque *urdail* ‘stomach, abomasum, rennet’ ~ PEC \**ǰǰǰV* ‘stomach, abomasum, rennet’ (NCED 670) ~ Burushaski *-ǰǰ* ‘abdomen, bowels’ ~ Na-Dene: Haida *s-ǰǰan* ‘intestines’
- PEC \**ǰǰV* ‘to put’ > Bezhta *ǰ=il-*, etc. (NCED 641) ~ PST \**ǰuaH* > Lushai *ǰto?* ‘to do’, etc. (ST II: 78) ~ Na-Dene: Haida *s-ǰo* ‘to put inside, arrange’, *-ǰo* ‘motion in a vehicle’
- PNC \**ǰǰǰV* ‘hare’ > Ingush *ǰerg*, etc. (NCED 788) ~ Burushaski *tur-* (in *tur-ǰǰn* ~ *tur-ǰǰn* ‘marmot’) ~ Na-Dene: PEA \**ǰu:nǰ* > Eyak *ǰǰ-ǰǰyahs* ‘mouse’, Navajo *ǰǰǰ?* ‘prairie dog’, etc.

§ A special note on the lateral affricates is required. The original phonemes are well preserved in Na-Dene languages and some Caucasian languages (especially Avar-Andian and Tsezian). In Basque and Burushaski the reflexes are conditioned depending on initial, medial, or final position. Initially all DC lateral affricates become Basque *ǰ*, Burushaski *t-/d-*. Medially they become Basque *-rd-*, Burushaski *-lt-/ld-* (*-lj-* before *-i*). Finally they become *-l* in both languages. In Sino-Tibetan we find \**ǰ* or \**ǰ* initially, \**k* (~ \**ǰ*) finally. In Yeniseian the pattern is initial glide \**j* versus final liquid (\**r*, \**l*, \**ǰ*).

PDC \**k*\*:

- Basque *be-hatz* ‘thumb, toe’, *hatz* ‘finger, paw’ ~ Avar *k<sup>w</sup>ač* ‘paw’, etc. (NCED 704) ~ Na-Dene: PAth \**-keč* > Hupa *ǰec* ‘claw’, etc.

- Basque *ahur* (*a-hur*) ‘hollow of hand, palm’ ~ PEC \**kHwǰrV* > Dargwa *kur* ‘pit’, etc. (NCED 691) ~ PST \**ǰh<sup>w</sup>ǰr* > Tibetan *s-kyor*, *khyor* ‘hollow of the hand filled with a fluid’, etc. (ST V: 106)
- Basque *hiri* ~ *iri* ~ *uri* (< \**xili* ~ \**xuli*) ‘village, city’ ~ PNC \**kǰtǰ* > Avar *kuli* ‘farmstead’ Abkhaz *a-kála* ‘hut’, etc. (NCED 692) ~ PST \**ǰ(h)ual* > Tibetan *khul* ‘domain, province, district’, etc. (ST V: 24)
- PST \**kǰw* > Tibetan *s-gu-stegs* ‘elbow, angle’ (cf. *khyu* ‘elbow’), Lushai *kiu* ‘elbow’, etc. (ST V: 55) ~ Na-Dene: Haida *s-kyúu-* ‘on one’s shoulder’; Tlingit *kǰy* ‘knee’

PDC \**k*\*:

- Basque (B) *kankano* ‘large fruitstone, kernel, almond’ ~ PNC \**kǰǰǰǰ(-nV)* > Avar *k’ork’ónu* ‘grape, berry’, Abkhaz *a-k’ak’án* ‘nut’, etc. (NCED 730) ~ Burushaski (N) *khakháayo* ‘walnut (in the shell)’<sup>20</sup> ~ Na-Dene: Haida *k’áank’aay* ~ *k’áank’aan* ‘unripe berries’, Navajo *-k’óó?* ‘seed, pit’
- Basque *uzki* (*u-z-ki*) ‘anus’<sup>21</sup> ~ ST: Tibetan *s-kyi-ša* ‘anus’ ~ Na-Dene: Haida *s-k’yáaw* ‘tail’; Tlingit *k’í* ‘rump, buttocks’
- PEC \**kǰwǰǰǰ* ‘lip’ > Avar *k’wet*, etc. (NCED 733) ~ Na-Dene: Haida (Skidegate) *k’úda* ‘lip’
- PNC \**kǰwǰǰǰ* > Dargwa *k’ac* ‘spleen’, Adyge *k’wac* ‘entrails, intestines’, etc. (NCED 735) ~ PY \**kič* > Ket *kǰt* ‘meat’, etc. (SSEJ 238) ~ Na-Dene: Haida *k’úuc* ‘abdomen, belly, stomach’

PDC \**g*\*:

- Basque *gal-* ‘to lose’ ~ PEC \**ǰgwǰǰ* ‘to lose, get lost; steal’ > Tsakhur *a=ǰwal-* ‘to get lost’, etc. (NCED 630)
- Basque *gose* ‘hunger, hungry’ ~ PNC \**ǰasǰ* ‘hunger’ > Lak *k:aši*, Rutul *ǰasǰ*, etc. (NCED 431) ~ Na-Dene: Galice *ǰas* ‘become hungry’
- Basque *egur* (*e-gur*) ‘firewood’ ~ PEC \**ǰǰrV* > Tsez *ǰiri* ‘pole’, Udi *ǰor*, *ǰorgor* ‘pole’, etc. (NCED 440) ~ ST: ? Tibetan *m-khar* ‘pole, stick’
- PEC \**ǰǰǰǰ* > Dargwa *ǰanzi* ‘ladder’, Lezgi *ǰürc:el* ‘door jamb, door post’, etc. (NCED 439) ~ Na-Dene: Haida *ǰáac* ‘house post’, Eyak *ǰa?c* ‘ladder’

PDC \**q*\*:

- Basque \**k(h)ola* in *ǰar-kola* ~ *ǰar-khola* ‘nape’ ~ PEC \**ǰHwǰǰwV* > Tindi *ǰolu* ‘back of the head’, etc. (NCED 894)
- PEC \**ǰqǰV* ‘brisket’ > Avar *me-héd*, Bezhta *ǰade* (NCED 897) ~ Burushaski (H) *-ǰat* ~ (N) *-ǰhat* ~ (Y) *-ǰet-aran* ‘armpit’ ~ ST: Tibetan *s-ked-pa* ‘waist’ ~ PY \**ǰot-* > Ket Imbat *ǰota* ‘ahead, forward’, etc. (SSEJ 263) ~ Na-Dene: Haida *s-ǰ’ut* ‘armpit’; Tlingit *ǰǰt* ‘chest, breast’; Navajo *-ǰid* ‘breastbone’

<sup>20</sup> Unaspirated *k* is the expected reflex: this word has apparently been altered by phonosymbolic forces.

<sup>21</sup> See below (DC morphology) for analysis of the fossilized prefixes *u-* and *-z-*.

- PEC *\*qwīti* > Lak *q<sup>w</sup>it* ‘Adam’s apple; beak’, Kryz *χulut*’ (< *\*χut*’-ul) ‘larynx’, etc. (NCED 905) ~ Burushaski (H,N) *-qhát* ~ (Y) *-xát, -xat* ‘mouth’
- PEC *\*qwāqwV* ‘trough, basket’ (NCED 899) ~ PST *\*guāk* > Garo *khok* ‘basket’, etc. (ST V: 16) ~ PY *\*qək-* ‘spoon’ (SSEJ 259) ~ Na-Dene: Haida *qikw* ‘basket’, Tlingit *qák<sup>w</sup>* ‘basket’<sup>22</sup>

PDC *\*q’*:

- Basque *k(h)arats* ‘bitter’ ~ PNC *\*qěłilV* ‘bitter’ (NCED 912) ~ Burushaski (Y) *qaqá-m* ~ (H,N) *yaqá* ▶ (*-um*) ‘bitter’ ~ PST *\*ghāli* ‘bitter’ > Burmese *khah*, etc. (ST V: 18) ~ PY *\*qVqVr* ‘bile, bitter’
- Basque (c) *kokots* ~ (BN,L) *kokotz* ~ (B) *okotz* ‘(point of) chin; snout (of animal)’ ~ PEC *\*qāčǝ* > Lak *q’ac* ‘bite; mouth’, Rutul, Tsakhur *q’ac* ‘chin’, etc. (NCED 907) ~ Na-Dene: Tlingit *χ’ás* ‘jaw’, Eyak *l-q’a?c* ‘jaw, angle of jaw’
- Basque (AN,BN,L) *kaillu* [kai.lu] ‘rind, bark, crust, peel’ ~ PEC *\*qwāłV* > Akhwakh *q’oli* ‘crust, rind’, etc. (NCED 931) ~ Na-Dene: Haida *q’at* ‘skin’; Sarsi *-kāt* ‘hide’, Navajo *-kał* ‘leather’<sup>23</sup>
- Basque *oski* ‘shoe’ ~ PEC *\*qHwōšwV* (~ *\*šwōqHwV*) > Dargwa (Akushi) *q’qš* ‘foot, leg’, Tabasaran *šaq’<sup>w</sup>* ‘heel’, etc. (NCED 926) ~ Burushaski *šoq* ‘sole of shoe’ ~ Na-Dene: Haida *st’a-q’usü* ‘heel’; Tlingit *q’os* ~ *χ’us* ‘foot’; Eyak *-q’a’s* ‘foot’, *-q’e’s* ‘ankle’
- PY *\*qoqante* ‘hunger’ > Ket *qo:t*, etc. (SSEJ 265) ~ Na-Dene: Haida *q’ut* ‘(be) hungry’, *q’udaal* ‘famine’

PDC *\*g*:

- Basque *gogor* ‘hard’ ~ PEC *\*GwērV* ‘stone’ (NCED 467) ~ Burushaski *γoró* ~ *γuró* ‘stones’ ~ PST *\*Kor* > Tibetan *gor* ‘stone(s), rubble’, etc. (ST V: 121)
- Basque *agor* ~ *igar* ~ *ehar* ‘dry’ ~ PNC *\*=iGwĀr* ‘dry, to dry’ > Avar *=aq:ˀarab*, etc. (NCED 631) ~ Burushaski (N) *qharáo* ‘dried up’ ~ PST *\*kār* ‘dry’ (ST V: 50) ~ PY *\*qor<sub>1</sub>* ~ *\*qV[G]i-* ‘dry’ > Kott *ši-gal*, Arin *qoja*, etc. (SSEJ 265) ~ Na-Dene: PAth *\*gay* ‘dry’ > Ingalik *-gəŋ*, Navajo *-gàn*, etc.
- Basque *gorri* ‘red; incandescent’, *gorringo* ‘yolk of egg’ ~ Na-Dene: PAth *\*-gay* ‘white’; Tlingit *-ge / -gi* ‘bright, shining’; Haida *gay* ‘blood’
- PEC *\*Gwōr?e* ‘hare’ > Hunzib *qi*, Budukh *q:ur*, etc. (NCED 472) ~ PST *\*qh<sup>w</sup>ār* > Old Chinese *\*wār* ‘badger’, Jingpo *mə-gan* ‘a species of ground rat’, etc. (ST V: 167) ~ Na-Dene: Eyak *gəχ* ‘rabbit’; PAth *\*gaχ* ‘rabbit’ > Slave *gah*, Navajo *gàh*, etc.

PDC *\*ʔ*:

- Basque *ar* ‘male’ ~ PEC *\*ʔirλwV* ‘male’ > Ingush *ārĥ* ‘ungelt’, etc. (NCED 210) ~ Burushaski *hir* ‘man, male’
- Basque *joan* ‘to go’ < *\*e-oan* ~ PNC *\*=VʔwV-* ‘to go’ > Karata *=oʔan-*, etc. (NCED 1016) ~ PST *\*ʔwǎ* ‘to go’ > Burmese *s-wah*, etc. (ST V: 11) ~ PY *\*hejVŋ* > Kott *hejan* ‘to go, ride’, etc. (SSEJ 231)
- Basque *hondar* ‘sand, beach’ ~ PEC *\*ʔantV* > Tsez *atu* ‘dirt, mud’, Khinalug *ant* ‘earth, ground’ (NCED 201)
- PEC *\*ʔāłV* ‘branch’ > Tindi *hala*, etc. (NCED 242) ~ PST *\*jəl* ‘sprout, branch’ > Tibetan *yal-ga* ‘branch, bough’ (ST IV: 82) ~ PY *\*ʔul-an* ‘twig’ > Ket *ulan*, etc. (SSEJ 200) ~ Na-Dene: Eyak *ʔa’ł* ‘bough, limb, branch (of conifer)’; PAth *\*ʔi’ł* > Hupa *ʔił* ‘pine boughs’, Navajo *ʔił* ‘evergreen boughs’, etc.

Proto-Dene-Caucasian probably had several fricatives corresponding to most of the positions of the occlusives: *\*s*, *\*š*, *\*ʃ*, *\*x*, *\*χ*, *\*h*. There are some indications that these fricatives may have had voiced allophones. For some examples of reflexes:

PDC *\*s / \*z*:

- Basque *zain* ‘nerve, blood vessel’ ~ PEC *\*sěhmV* > Chamalal *s:ē* ‘sinew, muscle’, etc. (NCED 959) ~ PST *\*(r-)sǎ* > Old Chinese *\*sə* ‘silk, thread’, Jingpo *lə-sa* ‘tendon, sinew’, etc. (ST IV: 96)
- Basque *bi-zi* ‘life, alive’ ~ Lak *s:iħ* ‘breath, vapor’, Chechen *sa* ‘soul’, etc. < PNC *\*sǝHwV* (NCED 961) ~ PST *\*sǝj(H)* > Old Chinese *\*sij?* ‘to die; death’, etc. (ST IV: 102) ~ Na-Dene: Tlingit *sa, sen* ‘to breathe, blow’; Eyak *sīh* ‘to die’<sup>24</sup>
- Basque *ze-r* ‘what?’, *ze-in* ‘which?’ ~ PNC *\*sǎj* > Ingush *se* ‘what?’, Ubykh *sa* ‘what?’, etc. (NCED 958) ~ Burushaski *bé-sa-n* ‘what, which?’, *bé-se* ‘why?’ ~ PST *\*su* ‘who?’ (ST IV: 108); Lepcha *sǎ-re* ‘which, what?’, *sǎ-ba* ‘where?’, etc. ~ PY *\*ʔas-* / *\*sV-* (interrogative stem) > Ket *asés* ‘what?’, etc. (SSEJ 182) ~ Na-Dene: Haida *gú-su* ‘what?’, *us* (yes-or-no question marker); Tlingit *dà-sa* ‘what?’, *sa* (interrogative particle), etc.
- PEC *\*sīnō* > Lak *s:an* ‘foreleg, paw, pad’, Udi *sun* ‘elbow’, etc. (NCED 963) ~ Burushaski (H,N) *-súsun*, (Y) *-sésen* ‘elbow’ ~ PST *\*sēn* > Tibetan *sen* ‘fingernail, toenail’, etc. (ST IV: 99)

<sup>22</sup> The Yeniseian and Na-Dene words suggest original *\*qVk-*, with progressive assimilation in Caucasian and regressive assimilation in Sino-Tibetan.

<sup>23</sup> The expected reflex in Sarsi and Navajo would be *k’*. Unexplained.

<sup>24</sup> “The semantic developments ‘to breathe’ > ‘get tired’ ... > ‘die’ are quite usual.” (NCED 961). Cf. Russian *dušá* ‘mind, soul, spirit’: *dušít* ‘to smother’.

- Burushaski (Y) *asúmun* ‘star’, (H) *asif* ‘star’, *asiúmuc* ‘stars’ ~ PST *\*sēŋ* ‘star’ > Old Chinese *\*sēŋ*, Hruso *li-tsoŋ* ‘star’, etc. ~ Na-Dene: PAtH *\*səŋ?* ‘star’ > Ahtna *son?*, Carrier *səm*, Navajo *sò?*, etc.

PDC *\*š / \*ʒ:*

- Basque *sits* ‘moth’ ~ PEC *\*šwěʒV* ‘a kind of biting insect’ > Lak *suc* ‘tick’, etc. (NCED 988)
- Basque *esne* (*e-sne*) ‘milk’ ~ PEC *\*šām?V* > Tindi *š:ū* ‘milk’, Chechen *šin* ‘udder’, etc. (NCED 982) ~ Burushaski *šij* ‘milk, proceeds of milk’<sup>25</sup>
- PEC *\*šāī* ‘worm’ > Lezgi *šar*, etc. (NCED 982) ~ PST *\*šar* ‘louse’ > Rgyarung *sar*, etc. (ST IV: 115)
- PNC *\*šwĒ* > Andi *w-ošo* ‘son’, *j-oši* ‘daughter’, etc. (NCED 671) ~ Burushaski (Y) *-is* ‘young (of animals); child (of humans)’, (H,N) *-s-k(o)* ‘young (of animals); (jokingly) human child’ ~ Na-Dene: PAtH *\*-yažwə* ‘little; (woman’s) child’ > Navajo *-yáži* ‘child, little one’, *-yááz* ‘baby’, *yááš* ‘little one’

PDC *\*t:*

- Basque (Z) *ilhinti* ‘firebrand’ (< *\*i-łinti*) ~ PEC *\*łwindV* > Andi *łudi* ‘firewood’, etc. (NCED 764) ~ Na-Dene: Eyak *łid* ~ *łəd* ‘dead wood, dry wood’
- Basque *lerde* ~ *lirdi* ‘drivel, saliva’ ~ PEC *\*łwirdi* ‘manure, pus’ (NCED 763) ~ Burushaski *łit* ‘slime’ ~ PST *\*łVt* > Tibetan *łud* ‘phlegm, mucus; manure, dung’, etc. (ST III: 51) ~ Na-Dene: PAtH *\*łur* > Kutchin *łid* ‘scar’, Navajo *łood*, *-lood* ‘sore’, etc.<sup>26</sup>
- Basque *luze* ‘long’ ~ Burushaski *łusán-um* ‘long, far, tall’ ~ PST *\*lu* ‘long, far’ > Old Chinese *\*lhu* ‘far away’, Burmese *lu* ‘disproportionately tall’, etc. (ST III: 144; *\*lu* < *\*luh* < *\*lus*)
- PEC *\*łinfiV* > Dargwa *xunul* ‘woman’, Archi *ł:on:ol* ‘woman’, etc. (NCED 762) ~ Burushaski (Y) *łéndeš*, (H,N) *łéniš* ‘queen, wife of the Mir’ (homonym = ‘gold’)
- Basque *elhur* ~ *elur* (< *\*e-łur*) ‘snow’<sup>27</sup> ~ PEC *\*łiwV* ‘snow’ > Chechen *łō*, etc. (NCED 684) ~ Na-Dene: PAtH *\*łur* > Kato *loo* ‘frost’, Navajo *n-łó* ‘hail’; Eyak *ła* ‘glacier’

PDC *\*x / \*ɣ:*

- Basque *ihintz* (< *\*i-xinc*) ‘dew’ ~ PEC *\*xwǎmčwǎ* > Lak *xunča* ‘bog’, etc.

<sup>25</sup> With secondary retroflex [ʒ] conditioned by following velar nasal.

<sup>26</sup> This and the next two etymologies confirm the unusual development of PDC *\*t* > Burushaski *ɣ* = [ɣ] (voiced uvular fricative). For typology, cf. Old Armenian *astt* > (present day) *asty* ‘star’, etc.

<sup>27</sup> Basque *-r* is a relic of the DC plural ending (see below).

- (NCED 1065) ~ Burushaski *huš* ‘moisture (of field, ground)’ (? loan < Tibetan) ~ PST *\*χŭ(s)* > Tibetan *hus* ‘moisture, humidity’, etc. (ST V: 180)
- Basque (c) *aran*, (BN,Z) *arhan* (*ar-han*) ‘plum, sloe’ ~ Avar *géni* ‘pear’, Hunzib *hī*, etc. < PEC *\*γōn?V* ‘pear’ (NCED 475) ~ Burushaski *γaiŋ* ‘grapes’ ~ ST: Tibetan *r-gun* ‘vine, grape’, etc. (ST V: 153)
- PEC *\*χǎñfi* ‘water’ > Chechen *χi*, Andi *ł:en*, etc. (NCED 1060) ~ Na-Dene: Haida *fan-ł* ‘water, river’; Tlingit *hín* ‘water, river’
- PEC *\*xwōłfiV* ‘bosom’ > Rutul *xili* ‘armpit’, etc. (NCED 1065) ~ Na-Dene: Haida (Skidegate) *χil* ‘neck’; PAtH *\*-γwu:l* ‘windpipe, trachea’ > Hupa *-wol*, Chipewyan *-γùl*, etc.

PDC *\*χ / \*ɣ:*

- Basque *aho* (*a-ho*) ‘mouth’ ~ PNC *\*χwi-* in *\*χwim(V)ḫV* ‘mouthful’ > Khinalug *χob*, etc. (NCED 1082) ~ PST *\*khwē(H)* > Old Chinese *\*khō?* ‘mouth’ (ST V: 107) ~ PY *\*χowe* ‘mouth’ > Yug *xo*, etc. (SSEJ 302) ~ Na-Dene: *\*χU?* ‘tooth’ > Tlingit *χúχ*, Eyak *χuu-ł*, Navajo *-γòð?* ‘tooth’
- Basque *hari*, *hal-* ‘thread’<sup>28</sup> ~ PEC *\*χǎtV* > Tsez *χero* ‘sinew’, Chechen *χal* ‘thread’, etc. (NCED 1067) ~ Na-Dene: Eyak *χehł* ‘rope, cord, twine, string; to tie’
- Basque *hartz* ‘bear’, (Z) *haz-kú* ‘badger’ ~ PEC *\*χHVr[č]V* > Chechen *χešt* ‘otter’, Dargwa *χ:arc* ‘marten, squirrel’, etc. (NCED 1073) ~ PY *\*χas* > Kott *hāš* ‘badger’ (SSEJ 299) ~ Na-Dene: Haida *xúuc* ‘brown bear’; Tlingit *xúuc* ‘brown bear’; PAtH *\*xVc* ~ *\*xVs* ‘brown bear’ > Tsetsaut *xə*, etc.<sup>29</sup>
- Burushaski (Y) *-γoy-án*, (H) *-γuy-án* ‘hair (of head)’ ~ Na-Dene: Tlingit *χàw* ‘hair’; Eyak *-χu?* ‘fur’; PAtH *\*-γa?* ‘fur, hair’ > Navajo *-γàà?*, etc.
- Cauc: Botlikh *γadaru* ‘stream, brook’, Lak *qtara* ‘mountain stream’, etc. < PEC *\*βHwadVrV* (NCED 478) ~ Burushaski (Y) *γónderes* ~ *γondoles* ‘Wasser, das über viele Steine fließt’

PDC *\*h / \*fi:*

- Basque (Z) *hiin* ‘marrow, brain’, (L) *fuiñ* ‘marrow, pith’ ~ PEC *\*hwě?nV* > Akhwakh *hini* ‘blood’, Avar *han* ‘meat’, etc. (NCED 496) ~ Burushaski (Y) *huni* ‘stone (of fruit)’ ~ PST *\*ɣwǎj* ‘blood’ > Magari *hyu*, Mikir *vi* (ST V: 12)<sup>30</sup>

<sup>28</sup> This is one of several Basque words that have *-r-* in free form, but *-l-* in combinatory form, as first element in a compound (Trask 1997: 188ff.). The latter form (*hal-*) reflects the earlier stage, as attested in Caucasian and Na-Dene.

<sup>29</sup> Na-Dene *\*x* for expected *\*χ*: influenced by cultural factors (taboo, etc.)?

<sup>30</sup> Basque words of the type *mun* ‘marrow, brain’ are apparently of separate origin (cf. PEC *\*māhnū* ‘brain, head’ NCED 797). The semantic series ‘blood ~ flesh ~ marrow ~ brain ~ kernel’ is well documented. Cf., in Dravidian, Malayalam *niṇam* ‘coagulated blood’, Tamil *niṇam* ‘fat, flesh, serum’, and Kannada *neṇa* ‘fat, marrow’.

- Basque *haga* ‘long pole’ ~ PEC *\*hǎkwV* > Karata *hak’wa* ‘branch’, etc. (NCED 485) ~ PY *\*ʔəqe* ‘branch’ > Kott *ogé*, etc. (SSEJ 192)
- Basque *habe* ‘pillar, beam’ ~ PEC *\*hwěbē* > Avar *hubí* ‘post, pole, stem’, etc. (NCED 497)
- Basque *har*, (R) *ār* ‘worm’ ~ PEC *\*fiabarV* ‘worm’ > Avar *hapára*, etc. (NCED 508) ~ Burushaski (H,N) *har* ‘Kornwurm’
- Basque *ur* ~ (Z) *hur* ‘water’ ~ PEC *\*hǎwǎV* > Avar *ʃor* ‘river’, Lezgi *hiil* ‘sea, liquid’, etc. (NCED 537) Burushaski *hur* ‘wooden water conduit, gutter’
- PEC *\*hǎwǎmgV* > Tindi *hingʷar* ‘window’, Kryz *ʃag* ‘niche in wall, roof orifice’, etc. (NCED 535) ~ Burushaski *hiŋ* ‘door, gate’, *hiŋ*-baltar ‘entrance to a village (serves as gathering place)’

Proto-Dene-Caucasian also had resonants and glides, e.g. *\*m*, *\*n*, *\*r*, *\*l*, *\*w*, *\*j*. Some examples of reflexes are as follows:

#### PDC *\*m*:

- Basque *\*muku-r* > (B) *mukur* ‘trunk, base of tree’ ~ PEC *\*mhǒqwe* ‘oak-tree’ Tsakhur *moq*, etc. (NCED 811) ~ ST: Old Chinese *\*muk* ‘tree, wood’
- Basque (G) *musu* ‘nose’ ~ PEC *\*mHǎřwV* > Chamalal *maš* ‘snot’, etc. (NCED 816) ~ Burushaski *-múš* ‘snot’ (also ‘nose’ in Yasin)
- PEC *\*wǎmqV* ‘(eye-)witness’ > Chechen *baq* ‘true’, Dargwa *biq’-ri* ‘witness’ (NCED 1050) ~ PST *\*mjǎk* ‘eye’ > Old Chinese *\*muk*, Tibetan *mig*, Moshang *mak*, etc. (ST I: 31) ~ Na-Dene: Tlingit *wàg* (*wà:q*) ‘eye’; PAth *\*-n(ə)-weG-* > Ingalik *-maG-*, Navajo *-nááʔ* ‘eye’, etc.
- PNC *\*mhǎčē* ‘edge’ > Lak *mic* ‘tip, point’, etc. (NCED 813) ~ Burushaski *muš* ‘end, side, border’ ~ PST *\*māt* > Old Chinese *\*māt* ‘end, tip’ (ST I: 15) ~ Na-Dene: PAth *\*wəs* ‘riverbank’ > Hupa *mis*, Navajo *bis*, etc.

#### PDC *\*n*:

- Basque *negu* [neɣu] ‘winter’ ~ PNC *\*bwinʔV* = *\*ɣwinʔV* > Chechen *ʃa / ʃāna-* ‘winter’, Lak *ɣʷi- / ɣin-* ‘summer’, etc. (NCED 482) ~ PST *\*G(h)ũn* > Tibetan *d-gun* ‘winter’, etc. (ST V: 34) ~ Na-Dene: Haida *q’ín-at* ‘summer’, *q’ín-łel* ‘spring’
- Basque *nahi* ‘will, willingness, desire’ ~ PEC *\*ʔnVhV* > Lak *nih* ‘fright’, Lezgi *neh* ‘vicious, sinful’, etc. (NCED 216) ~ Na-Dene: PAth *\*-ne-* ‘mind’ > Navajo *-niʔ* ‘mind’, *-ní* (in *ʔóó-ní* ‘jealousy, grudge’, *yí-ní* ‘worry, lonesomeness’)
- Basque *nigar* ~ *negar* ‘tear’ (eye-water) ~ Dargwa *nery* ‘tear’, Chechen *not’q’a* ‘pus’, etc. < PEC *\*něwǎũ* (NCED 848) ~ Burushaski (H) *nagéi* ~ (N)

*magéi* ‘boil, ulcer’ ~ PST *\*nōk / \*nōŋ* ‘pus’ > Tibetan *r-nag* ~ *s-nag*, etc. (ST II: 40) ~ PY *\*dǒkj* ‘pus’ > Ket *dǒŋ*, Kott *takŋ* (SSEJ 223)

- PEC *\*nHēmdV* > Andi *nidu* ‘eyebrow, eyelash’, Lak *nǐnt:a-bak* ‘forehead’, etc. (NCED 853) ~ Na-Dene: PAth *\*-ne:nʔ* ‘face’ > Ahtna *-ne:nʔ*, Hupa *-nənʔ*, etc.

#### PDC *\*r*:

- Basque *erreka* ‘ravine, rivulet, arroyo’ ~ Tindi *rek’a* ‘gorge, ravine’, etc. < PNC *\*riǧwǎ* (NCED 953)
- Basque *erbi* ‘hare’, *erbi*-nude ‘weasel’ (< *\*e-rVgʷi*) ~ PNC *\*riǧwǎ* ‘weasel, mouse’ > Tindi *reǎ’u* ‘weasel’, etc. (NCED 951) ~ PST [*\*ruak*] ‘rat’ > Burmese *k-rwak*, etc. (ST II: 100)
- Avar *rax* ‘milk’, etc. < PNC *\*rǎǎwǎV* (NCED 949) ~ Burushaski *dǎltar* ‘buttermilk’ ~ PST *\*rǎǎk* ‘thick fluid, liquid grease’ (ST II: 87)
- PST *\*rěk* ‘pheasant’ > Tibetan *s-reg-pa* ‘pheasant, partridge’, etc. (ST II: 65) ~ Na-Dene: PAth *\*dax* ‘grouse, spruce hen’ > Ahtna *dex*, Navajo *dih*, etc.

#### PDC *\*l*:

- Basque *euli* ‘fly’ (~ dialectal *uli* ~ *üli* ~ *ülü*, etc.) ~ Cauc: Archi *hil(i)ku* ‘fly’ ~ Burushaski (Y) *haülal* ‘butterfly, moth’, (H,N) *hoólalas* id.
- PEC *\*léHwV* > Inkhokwari *loje* ‘word, sound, voice’, Dargwa *luʃi* ‘number’ (NCED 744) ~ PST *\*lō* ‘sing’ > Old Chinese *\*law* ‘sing, song’, etc. (ST III: 30) ~ Na-Dene: PAth *\*-li* ‘to sing’ > Kato *leʔ*, etc.
- Lezgi *leq* ‘eagle’, etc. < PNC *\*lHiǧwǎ* (NCED 748) ~ PST *\*lǎk / \*lǎŋ* > Tibetan *g-lag* ‘eagle, vulture’, etc. (ST III: 8) ~ PY *\*dVʔG* ‘eagle’ > Ket *dǐʔ*, etc. (SSEJ 225) ~ Na-Dene: Haida *łgo* ~ *łgu* ‘heron’, Tlingit *laq* ~ *laɣ* ‘heron, crane’, etc.
- PST *\*lǎt* ‘tongue’ > Old Chinese *\*lat*, Magari *let*, etc. (ST III: 7) ~ Na-Dene: Tlingit *l’ut* ‘tongue’; Eyak *laʔt*

#### PDC *\*w*:

- Basque (B) *abetxo* [abečo] ‘shrub’ ~ PNC *\*wǎcV* ‘grass’ > Chechen *buc*, Adyge *wəcə*, etc. (NCED 1053) ~ Na-Dene: Tlingit *wás* ‘bush’
- Basque *sor-balda* ‘shoulder’ ~ PEC (*\*wəǎV*) ‘neck’ > Bezhta *boło*, Hunzib *bolo*, etc. ~ Burushaski (H,N) *-wáld-as*, (Y) *-wáld-es* ‘back’
- Basque *urde* ‘pig’ ~ PNC *\*wHǎřwə* > Tsez *beło*, Lezgi *wak* ‘boar, pig’, etc. (NCED 1047) ~ PST *\*wǎk* ‘pig’ > Burmese *wak*, Lushai *vok*, etc. (ST I: 121)
- PNC *\*wěnsǎ* > Akhwakh *mešu* ‘knife’, Khinalug *waz* ‘knife’, etc. (NCED 1042) ~ Na-Dene: Tlingit *wé:ǵš* ‘knife’; PAth *\*we:š(ʷ)* ‘knife’ > Tanaina *vaš*, Navajo *bééš*, etc.

PDC \*j:

- PEC \**ǰerǰwV* ‘belt, girdle’ > Hunzib *ɔǰe* ‘belt’, etc. (NCED 678) ~ Burushaski *-yáldir* ~ *-yáldin* ‘the part of the ribs under the armpit; the middle part of the breast’ ~ PST \**ǰǎk* ‘armpit’ > Lushai *zak*, etc. (ST IV: 77)
- Burushaski *-yóon* ‘all, altogether’ ~ PST \**ǰǰ* ‘all, everything’ > Tibetan *yo-ba* ‘everything, altogether’, etc. (ST IV: 87) ~ Na-Dene: \**ya-* ‘all’ > Tlingit *yá-χ* ‘entirely, severally, all’; Mattole *ya-, ya-* ‘all’, etc.; cf. Haida *ǰúʔan* ‘big’
- PNC \**ǰVcwǰ* ‘mouse’ > Dargwa *waca* ‘mouse’, Abkhaz *á-ješ* ‘squirrel’ (NCED 685) ~ PST \**ǰǰ* > Tibetan *yos* ‘hare’ (astronomical), Kanauri *p-yu* ‘rat’, etc. (ST IV: 87)
- PNC \**ǰǎmǰǎ* ‘snow’ > Rutul *jiz*, etc. (NCED 674) ~ Na-Dene: PAth \**ǰǰs* ‘snow’ > Chipewyan *yàθ*, Navajo *yàs*, etc.

The original vowel system of Dene-Caucasian has been studied much less than the consonants. The following observations pertain to the correspondences between Basque vowels and the Caucasian (PNC/PEC) vowels postulated by Nikolayev and Starostin (1994).

Basque /a/ regularly corresponds to Caucasian \**a* (\**ǎ*, \**ǎ̄*):

- Basque (*h*)*a-* (article, demonstrative) ~ PEC \**ǎ* (emphatic demonstrative stem: NCED 436)
- Basque *sare* ~ *sale* ‘net, grate; stockade’ ~ Avar *čǎli* ‘fence’ < PEC \**čǎlǎ* (NCED 343)
- Basque *hatz* ‘finger, paw’ ~ Avar *kʷaǰ* ‘paw’, etc. < PNC \**kwǎnVčǰ* (NCED 704)
- Basque *izar* (*i-zar*) ‘star’, etc. ~ Tindi *c:aru* ‘star’, etc. < PNC \**ǰwǎhri* (NCED 1098)
- Basque *sabel* ‘belly, stomach’ ~ PNC \**ǰǎwV* ‘kidney, liver’ (NCED 1106)
- Basque *lasto* ‘straw’ ~ PEC \**ǎčǎ* ‘leaf; a kind of plant’ (NCED 773)
- Basque *sagu* ‘mouse’ ~ PNC \**cǎrgwǎ* ‘weasel, marten’ (‘mouse’ in Circassian: NCED 322)
- Basque *hari, hal-* ‘thread’ ~ PEC \**ǰǎV* ‘sinew, thread’ (NCED 1067)
- Basque (R) *atze* ‘tree’ ~ PNC \**Hǎ(r)ǰwǎ* ‘tree’ (NCED 549)
- Basque *har, (R) ǎr* ‘worm’ ~ PEC \**ǎbarV* ‘worm’ (NCED 508)
- Basque *haga* ‘long pole’ ~ PEC \**ǎǰwV* > Karata *hakʷa* ‘branch’, etc. (NCED 485)

In several cases Basque /a/ corresponds to Caucasian \**e*, in the environment of a liquid or lateral affricate:

- Basque *belarri* (*be-larri*) ‘ear’ ~ PNC \**ǎHte* ‘ear’ (NCED 756)
- Basque *k(h)arats* ‘bitter’ ~ PNC \**ǎčǎV* ‘bitter’ (NCED 912)
- Basque *zahar* ‘old’ ~ PNC \**swǎrǎ* ‘old, year’ (NCED 968)
- Basque *harri* ‘stone’ ~ PEC \**ǎHǎǰV* ‘small stone, gravel’ (NCED 1073)
- Basque *larri* ‘sadness, anguish’ ~ PNC \**ǎwǎV* ‘hard, severe, stern’ (NCED 792)
- Basque (Z) *lape* ‘shelter under the eaves of a shed’ ~ PEC \**ǎčǎV* ‘stone plate or shed’ (NCED 777)
- Basque *laiño* ~ *lanbro* ‘fog, mist’ ~ PEC \**ǎǰwV* ‘cloud, fog’ (NCED 947)
- Basque (AN) *barda* ‘belly, paunch’ ~ PEC \**ǎčǎV* ‘large intestine’ (NCED 297)
- Basque *hardo* ‘tinder (made from fungus)’ ~ PEC \**ǎwǎV* ‘a kind of grass’ (NCED 230)

Basque /e/ corresponds to Caucasian \**e* and \**ǎ*:

- Basque *bek(h)o* ‘forehead, beak’ ~ PEC \**ǎčǎ* ‘part of face, mouth’ (NCED 289)
- Basque *erdi* ‘half, middle’ ~ PNC \**čǎǎ* ‘half, middle’ (NCED 412)
- Basque *negar* ~ *nigar* ‘tear’ ~ Dargwa *nery* ‘tear’, etc. < PEC \**ǎwǰǰ* (NCED 848)
- Basque *gose* ‘hunger, hungry’ ~ PNC \**ǎšǎ* ‘hunger’ (NCED 431)
- Basque *habe* ‘pillar, beam’ ~ PEC \**ǎwǎǎ* ‘post, pole, tower’ (NCED 497)
- Basque *sare* ~ *sale* ‘net, grate; stockade’ ~ PEC \**čǎlǎ* ‘enclosure, fence’ (NCED 343)
- Basque *zelai* ‘plain’ ~ PEC \**ǰǎV* ‘plain, plateau’ (NCED 1092)
- Basque (archaic Bizkaian) *ze* ‘not’ ~ PEC \**ǎǎ* ‘not’ (NCED 1101)
- Basque *lema* ‘rudder’ ~ PEC \**ǎǎmǎV* ‘roof’ (NCED 777)
- Basque *herri* ‘inhabited place, people’ ~ PNC \**ǎwǎhri* ‘people, troop’ (NCED 249)
- Basque *hegi* ‘ridge’ ~ PEC \**ǎwǎrgǎ* ‘mountain ridge’ (NCED 536)

Basque /i/ corresponds to Caucasian \**i* and \**ǎi*:

- Basque *hil* ‘dead; die; kill’ ~ PNC \**ǎwǎǎ* ‘die; kill’ (NCED 661)
- Basque *ipini* ~ *imǎni* ‘to put’ ~ PEC \**ǎima(n)* ‘to stay, be’ (NCED 210)
- Basque *izeba* (*ize-ba*) ‘aunt’ ~ PEC \**ǎčǎwǎ* ‘girl, woman’ > Chechen *d-čǎa* ‘paternal aunt’ (NCED 952)
- Basque *zikiro* ‘castrated goat’ ~ PNC \**ǎǎkV* ‘goat, kid’ (NCED 1094)
- Basque (BN,L) *miko* ‘little (bit)’ ~ PEC \**ǎmǎkV* ‘small, young one’ (NCED 821)
- Basque *tximitxa* [čimičǎ] ‘bedbug’ ~ PEC \**čǎimVčǎV* ‘butterfly’ (NCED 379)
- Basque *hiri* ‘village, city’ ~ PNC \**ǎkǎ* ‘farmstead, hut’ (NCED 692)
- Basque *ilindi* ~ *ilhinti* ‘firebrand’ ~ PEC \**ǎwǎndV* ‘firewood’ (NCED 764)
- Basque *lirdi* (~ *lerde*) ‘drivel, saliva’ ~ PEC \**ǎwǎrdi* ‘manure, pus’ (NCED 763)
- Basque *ihintz* (< \**i-xinc*) ‘dew’ ~ PEC \**ǎwǎmčǎwǎ* ‘dirt, bog’ (NCED 1065)
- Basque *ahizpa* (*a-hiz-pa*) ‘sister (of a woman)’ ~ PNC \**ǎčǎ* ‘sister, brother’ (NCED 669)
- Basque (*h*)*osin* ‘deep place in a river’ ~ PEC \**ǎwǎčǎV* < \**ǎčǎinV* ‘well, spring’ (NCED 232)

Basque /o/, the least frequent vowel, corresponds to Caucasian \**o*, also to Caucasian \**e*, \**ǎ*, and \**ǎi* (in labial environments)<sup>31</sup>:

- Basque *oso* ‘whole, complete’ ~ PNC \**ǎčǎV* ‘full, fill’ (NCED 525)
- Basque *atso* (*a-tso*) ‘old woman’ ~ PNC \**čǎwǎǎV* ‘woman, female’ (NCED 374)
- Basque *zor(h)i* ~ (B) *zoli* ‘fortune, luck; to mature, ripen’ ~ PNC \**ǎčǎV* ‘healthy, whole’ (NCED 1095)
- Basque *sor-* ‘body’ (in compounds) ~ PEC \**čǎčǎV* ‘body’ (NCED 346)
- Basque *otso* ‘wolf’ ~ PNC \**ǎčǎčǎ* ‘wolf’ > Andi *bocʷo*, etc. (NCED 294)
- Basque *or* ~ (Z) *hor* ~ *ho* ‘dog’ ~ PEC \**ǎHwǎčǎV* (oblique stem) ‘dog’ > Budukh *χor*, etc. (NCED 1073)
- Basque (B) *txorru* [čǎfu] ‘root of hair’ ~ PEC \**čǎčǎwǎV* ‘hair’ > Avar *čʷor*, etc. (NCED 378)
- Basque *aho* (*a-ho*) ‘mouth’ ~ PNC \**ǎwǎ* in \**ǎwǎm(V)ǎV* ‘mouthful’ > Khinalug *χob*, etc. (NCED 1082)

<sup>31</sup> Note the convergent developments (> *o*) in Caucasian



Basque *olho* ~ *olo* ‘oats’ ~ PNC \**λwřwV* ‘millet’ > Chechen *ho?*, etc. (NCED 763)

Basque /u/ corresponds to Caucasian \**wV*, \**Vw*.<sup>32</sup>

Basque *zu* ‘you’ (polite) ~ PNC \**zwe* ‘you’ (plural) > Lak *zu*, etc. (NCED 1086)  
Basque *zur* ~ (B) *zul* ‘wood’ ~ PEC \**čwřřV* ‘stick, branch’ > Andi *c’ul*, etc. (NCED 374)  
Basque (*h*)*ur* ‘water’ ~ PEC \**řwřV* ‘river, reservoir’ > Lezgi *hül*, etc. (NCED 537)  
Basque (*h*)*un* ‘brain, marrow, pith’ ~ PEC \**hwě?nV* ‘blood’ (‘meat’) > Lak *u* (NCED 496)  
Basque *bul(h)ar* ‘chest, breast’ ~ PEC \**Gwǎřřē* ‘udder, breast’ (NCED 465)  
Basque *idulki* (*i-dul-ki*) ‘block of wood’ ~ PEC \**dwǎř* ‘stick’ (NCED 405)  
Basque *elhur* ~ *elur* (< \**e-řu-r*) ‘snow’<sup>33</sup> ~ PEC \**řwV* ‘snow’ (NCED 684)

The syllabic structure of PDC nouns was typically CV(C)CV, and traces of this original pattern are frequent in Basque and some Caucasian (Dagestanian) languages:<sup>34</sup>

(final -i/-e)

Basque *azeri* ‘fox’ ~ Tindi *sari* ‘fox’, etc. (NCED 324)  
Basque *hiri* ‘village, city’ ~ Avar *kul* ‘farmstead’ (NCED 692)  
Basque *mih* ‘tongue’ ~ Tindi *míc:i* ‘tongue’, etc. (NCED 802)  
Basque *txori* /čori/ ‘bird’ ~ Tindi *čuri-čařa* ‘quail’ (NCED 388)  
Basque *erdi* ‘half, middle’ ~ Tindi *b-ař:i* ‘in the middle’ (NCED 412)  
Basque *ilindi* ~ *il(h)inti* ‘firebrand’ ~ Andi *łudi* ‘firewood’ (NCED 764)  
Basque *ipurdi* ‘rump, buttocks’ ~ Bezhta *pirt’i* ‘bladder, lung’ (NCED 871)  
Basque *gose* ‘hunger, hungry’ ~ Lak *k:aři* ‘hunger’, etc. (NCED 431)  
Basque *abere* ‘domestic animal’ ~ Udi *bele* ‘cattle’ (NCED 314)  
Basque *habe* ‘pillar, beam’ ~ Avar *řubi* ‘post, pole, stem’ (NCED 497)  
Basque *sare* ~ *sale* ‘net, grate; stockade’ ~ Avar *čali* ‘fence’ (NCED 343)

(final -u/-o)

Basque *sagu* ‘mouse’ ~ Avar *cař:u* ‘weasel’, etc. (NCED 322)<sup>35</sup>  
Basque *řisu* ‘blind’ ~ Tindi =*ec:u-b* ‘blind’, etc. (NCED 1017)  
Basque *txainku* [čájŋkü] ~ *xanku* [řanku] ‘lame’ ~ Burushaski *čhangú* ~ *čangú* ‘lame’  
Basque *ukondo* ‘elbow’ ~ Hinukh *řontu* ‘knee’, etc. (NCED 925)  
Basque (dial.) *miko* ‘a little (bit)’ ~ Chamalal *miķu-b* ‘small’ (NCED 821)  
Basque (B) *kankano* ‘stone, kernel, almond’ ~ Avar *k’ork’onu* ‘grape, berry’ (NCED 730)  
Basque *otso* ‘wolf’ ~ Andi *bočo* ‘wolf’, etc. (NCED 294)  
Basque *sorho* ~ *solo* ‘meadow, field’ ~ Lak *řglu* ‘earth, ground’ (NCED 342)

The other western DC language, Burushaski, also preserves traces of the CV(C)CV structure:

Burushaski *jořli* ‘filter woven out of twigs’ ~ Tsez *želi* ‘wattle fence’, etc. (NCED 1108)

Burushaski (H) *táno* ‘rectum’ ~ Avar *t’ínu* ‘bottom’, etc. (NCED 590)  
Burushaski *řuno* ~ *řono* ‘seed’ ~ Botlikh *xuni* ‘seed’, etc. (NCED 1021)  
Burushaski *řoro* ‘stones’ ~ Chechen *qěra* ‘stone’, etc. (NCED 467)  
Burushaski *hurgó* ~ *horgó* ‘up(hill), ascent’ ~ Dargwa (*h*)*urqi* ‘mountains’, etc. (NCED 536)  
Burushaski *tumá* ~ *tumá* ‘nutshell, stone (of fruit)’ ~ Abkhaz *a-t’amá* ‘peach’ (NCED 1004)  
Burushaski *phulyúu* ~ *pholyó* ‘feather’ ~ Dargwa *přhala* ‘feather’ (NCED 879)  
Burushaski (Y) *huni* ‘stone (of fruit)’ ~ Akhwakh *hini* ‘blood’ (NCED 496)  
Burushaski (Y) *čargé* ‘flying squirrel’ ~ Avar *cař:u* ‘weasel’, etc. (NCED 322)

In the remaining DC languages (Sino-Tibetan, Yeniseian, Na-Dene) there is a strong tendency to reduce all words to monosyllabic forms, or at least to reduce syllables by apocope or syncope. Indeed, this tendency to reduce syllables is found to varying degrees in all DC branches. For example, in Basque final vowels frequently have been lost when a root contains a nasal or rhotic (PNC or PEC reconstructions represent the earlier stage):

Basque *zain* ~ *zař* ‘nerve, blood vessel’ (cf. PEC \**řěhmV* ‘muscle, intestine’ NCED 959);  
Basque *mun* ~ *muin* ~ *muř* ‘marrow, brain, pith’ (cf. PEC \**māhnū* ‘brain, head’ NCED 797);  
Basque *or* ~ *hor* ‘dog’ (cf. PEC \**řHwěřV* ‘dog’ NCED 1073);  
Basque *ar* ‘male’ (cf. PEC \**řřwV* ‘male’ NCED 210; Burushaski *hir* ‘man, husband’)

In Burushaski some words originally containing nasals have lost the nasal as well as the following vowel, a reduction shared in some cases with Sino-Tibetan as well as some Caucasian languages:

Burushaski *du* ‘young goat’ ~ PNC \**dwǎn?V* / \**dwǎnhV* ‘sheep, ram’ > Chechen *tō*, Lak *t:a*, etc. (NCED 405)  
Burushaski *gu* ‘soot’ ~ PNC \**ķwřnhV* ‘smoke’ > Lak *ķuw* ‘soot’, etc. (NCED 738) ~ PST \**gh[i]w* ‘smoke, smell’ (ST V: 21) ~ PY \**giř* > Kott *kiř* ‘smell, odor’ (SSEJ 228) ~ Basque *ķ(h)ino* ‘bad odor’ ~ (Z) *khřno* ‘bad taste’  
Burushaski *sú* ~ *sui* ‘navel’ ~ PEC \**řonřū* ‘navel’ > Dargwa *zu*, etc. (NCED 1096)

The sequence of development was, for example, \**gunHV* > \**gū(H)* > *gu* ‘soot’, the Burushaski development convergent with developments in Sino-Tibetan (\**gh[i]w*) and some Caucasian languages (e.g., Lak *ķuw* ‘soot’). Similar developments have to be posited for Na-Dene, for example:

Na-Dene: \**ř’eh* > Hupa -*ř’eh* ‘crotch’, Chipewyan -*ř’é* ‘between the legs of’, Navajo *ř’eh*, -*ř’eh* ‘crotch’, etc. ~ Avar *ř.an* ‘groin’ < PEC \**řwVn?V* ~ Burushaski -*łtin* ‘bone’, etc.  
Na-Dene: \**dāř* > Eyak *da?* ‘mouth’, Hupa -*da?* ‘mouth, lips’, Chipewyan -*dā*, -*dá* ‘lip, beak’, Navajo -*dā?* ‘lip, bill’ ~ PEC \**dānř* ‘cheek; gum’ ~ ST: Tibetan m-*dan* ‘cheek’

<sup>32</sup> Note the convergent developments (> *u*) in Caucasian.

<sup>33</sup> Basque -*r* is a relic of the DC plural ending (see below).

<sup>34</sup> Note that in the cited cases Basque and Caucasian words have similar final vowels (*i/e* = *i/e*; *u/o* = *u/o*).

<sup>35</sup> This looks like an equation of Basque *g* [y] = Caucasian \**ř*, but the Avar *ř* is secondary here, according to NCED (322), < PNC \**čargwř* ‘weasel, marten’ (‘mouse’ in Circassian).

## II. Morphology:

### A: The Noun:

There is evidence from all DC branches that there was a system of noun classification in Proto-DC. Systems of this type, more or less transformed, persist to this day in many Caucasian languages, Burushaski, Yeniseian (Ket), and perhaps in Na-Dene. In the other languages (particularly Basque and Sino-Tibetan) only fossilized vestiges remain. In the comparison of Basque with other DC languages, it has long been known that Basque frequently has “leftover” initial segments that appear to be fossilized prefixes. The most striking of these is probably *be-/bi-*. The original separability of this element is shown even by internal reconstruction in words such as Basque *hatz* ‘finger, paw’ vs. *be-hatz* ‘thumb, toe’ (meanings vary widely depending on dialect); Basque *herde* ~ *helder* ‘drivel’ is *bilder* (< \**bi-* + *helder*) in the Gipuzkoa dialect. These and other examples are listed with probable cognates in other DC languages:

- Basque *be-hatz* ‘thumb, toe’ (vs. unprefixated *hatz* ‘finger, paw’) ~ Avar *k<sup>w</sup>ač* ‘paw’, etc. (NCED 704) ~ Na-Dene: Navajo *kač*<sup>1</sup>
- Basque *behazun* (*be-ha-zun*) ‘bile’ ~ PNC \**čwǎjmě* ‘gall, anger’ (NCED 329) ~ Burushaski –*sán* ‘spleen’ ~ PST \**sín* ‘liver’ (ST IV: 103) ~ PY \**sej* ‘liver’ ~ Na-Dene: Eyak *sa<sup>h</sup>t*, Tanaina *zi<sup>t</sup>*, Navajo *zid* ‘liver’ (if < \**sVN-t*)
- Basque *be-larri* ‘ear’ ~ Batsbi *larḱ* < \**lari-ḱ* ‘ear’, etc. (NCED 756)
- Basque *be-l(h)aur* ‘knee’ (with combinatory forms such as *be-l(h)aur-*) ~ Akhwakh *ełelo* ‘elbow’, etc. (NCED 770)
- Basque (G) *bi-lder* ‘drivel’ (vs. unprefixated *helder* ~ *herde* in other dialects) ~ Karata *hanḷa* ‘sweat’, etc. (NCED 509) ~ Na-Dene: Haida *ḷ’an* ‘saliva’
- Basque *bizkar* (*bi-z-ka-r*)<sup>1</sup> ‘back’ ~ Caucasian: Abkhaz *azk<sup>w</sup>a* ‘back’ ~ Burushaski –*sqā* ‘on one’s back’ ~ ST: Tibetan *s-ku* ‘body’ ~ Na-Dene: Haida *s-ku* ‘back’
- Basque *birika* (*bi-rika*) ‘lung’ ~ PNC \**ǰērḱwǎ* ‘heart’ > Avar *rak*, Lezgi *rik*, etc. (NCED 678) ~ PST \**ǰrǎj* // \**ǰrǎk* ‘breast’ (ST IV: 6)
- Basque *bihotz* (*bi-hotz*) ‘heart’ ~ Burushaski *koč* ‘blood’ (in curses and oaths)
- Basque *bi-zi* ‘life, alive’ ~ Lak *s:ih* ‘breath, vapor’, Chechen *sa* ‘soul’, etc. (NCED 961) ~ PST \**siǰ(H)* ‘to die’ (ST IV: 102) ~ Na-Dene: Tlingit *sa, sen* ‘to breathe, blow’; Eyak *sih* ‘to die’<sup>2</sup>

Semantically, all of these words have to do with body parts, or fluids (bile, saliva), or attributes (life) of the body. In a Dene-Caucasian context, the most obvious comparison is with the East Caucasian class element that frequently appears in the form *b-*, sometimes prefixed to nouns, e.g. Tindi *b-eḷ:u* ‘stomach’ (NCED 670), *b-aḷ:i* ‘in the middle’ (NCED 412); and the prefix appearing as *b-* or *p-* in some West Caucasian words: Ubykh *b-ḷa* ‘eye’ (NCED 250), *p-čā* ‘guest’ (NCED 612). This element is reconstructed as PNC

\**w-* ‘marker of III class singular’ (Diakonoff & Starostin 1986; Nikolaev & Starostin 1991). On the possible connection with Sino-Tibetan \**b-* (and/or \**m-*), see below.

Basque has several other fossilized prefixes in addition to *be-/bi-*. Because of the patterning of *be-/bi-* (with an alternation between two similar vowels), I have posited that the *e-* and *i-* prefixes be conflated as *e-/i-*, for example:

- Basque *elhur* ~ *elur* (< \**e-ḷu-r*) ‘snow’<sup>3</sup> ~ PEC \**ḷiwV* ‘snow’ > Chechen *lō*, etc. (NCED 684) ~ Na-Dene: Kato *loo* ‘frost’, Navajo *n-łó* ‘hail’, etc.
- Basque *egur* (*e-gur*) ‘firewood’ ~ Udi *gor, gorgor* ‘pole’, etc. (NCED 440)
- Basque (Z) *ekhei* (*e-khei*) ‘material’ (beside unprefixated *gai* ~ *gei*) ~ Lak *qaj* ‘thing(s), ware(s)’, etc. (NCED 930)
- Basque *esne* (*e-sne*) ‘milk’ ~ Chechen *šin* ‘udder’, etc. (NCED 982) ~ Burushaski *šij* ‘milk’
- Basque *etxe* [eče] (*e-txe*) ‘house’ ~ PNC \**č[ɽ]ju* ‘house’ > Khinalug *č<sup>w</sup>a*, etc. (NCED 364) ~ Burushaski –*yeéš* ‘dwelling place’
- Basque *izar* (*i-zar*) ‘star’, etc. ~ Tindi *c:aru* ‘star’, etc. (NCED 1098)
- Basque *ihintz* (*i-hintz* < \**i-xinc*) ‘dew’ ~ Lak *xunča* ‘bog’, etc. (NCED 1065) ~ PST \**χú(s)* > Tibetan *hus* ‘moisture, humidity’, etc. (ST V: 180)
- Basque (Z) *ilhinti* ‘firebrand’ (< \**i-ḷinti*) ~ PEC \**ḷwindV* > Andi *ludi* ‘firewood’, etc. (NCED 764) ~ Na-Dene: Eyak *tid* ~ *ḷad* ‘dead wood, dry wood’, etc.
- Basque *idulki* (*i-dul-ki*) ‘block of wood’ ~ Ingush *tāl-g* ‘chock’, etc. (NCED 405)
- Basque *izerdi* (*i-zerdi*) ‘sweat, sap’ ~ PEC \**čāZwV* ‘blood, life’ (NCED 376) ~ PY \**sur* ‘blood’
- Basque *ipurdi* (*i-purdi*) ‘rump, buttocks’ ~ Bezhta *pir<sup>t</sup>i* ‘bladder, lung’, etc. (NCED 871) ~ Burushaski (Y) *phaḷ* ‘gizzard; stomach (of fowl)’ ~ Na-Dene: Eyak *wət* ‘vomit’; Path \**wət* > Navajo *-bid* ‘belly’, etc.
- Basque *iztai* (*i-z-tai*) ‘groin’ ~ Caucasian: Adyge *š<sup>w</sup>t:ə* ‘genitals’ ~ Burushaski (Y) –*šij* ‘loins, waist’
- Basque *izter* (*i-z-te-r*) ‘thigh’ ~ Avar *het<sup>é</sup> / het* ‘foot’, etc. < PEC \**ḷwǎV* (NCED 1007) ~ Burushaski –*ūt* ~ –*úḷis* ~ –*hútes* ‘foot’ ~ PST \**tǎH* > Old Chinese \**tǎ?* ‘foot, heel’ (ST II: 123) ~ Na-Dene: Haida *s-t<sup>á</sup>ay, s-t<sup>á</sup>a* ‘foot’

This noun class putatively included liquids and other mass nouns (milk, dew, snow, wood), as well as some body parts. This *e-/i-* prefix can be connected with the East Caucasian class marker reconstructed as \**j-* ‘II-class singular’ (Diakonoff & Starostin 1986; Nikolaev & Starostin 1991). For example, in the Avar-Andian languages this prefix appears on words for ‘sister’ (e.g. Avar *j-ac*) and ‘daughter’ (Avar *j-as*), as opposed to words for ‘brother’ (Avar *w-ac*) and ‘son’ (Avar *w-as*), which have reflexes of the I-class prefix \**u-* (see below). Elsewhere, the word for ‘snow’ in Lezgian languages (Lezgi *žiw*, Tabasaran *jif*, Agul *ibx*) seems to reflect an incorporated \**j-* prefix equivalent to *e-* in the Basque word (*elhur* ~ *elur* < \**e-ḷu-r* ‘snow’).

Parallel with *be-/bi-* and *e-/i-*, I have proposed to conflate the *o-* and *u-* prefixes as *o-/u-*, for example:

- Basque *olho* ~ *olo* ‘oats’ (< \**o-ḷo*) ~ PNC \**ḷwǎwV* ‘millet’ (NCED 763)
- Basque *odol* (*o-dol*) ‘blood’ ~ PST \**t(h)ǎH* ‘meat’ flesh’ (ST II: 158) ~ Na-Dene: Eyak *deḷ*

<sup>1</sup> The segments *-z-* and *-r* are discussed later in this treatise.

<sup>2</sup> “The semantic developments ‘to breathe’ > ‘get tired’ ... > ‘die’ are quite usual.” (NCED 961). Cf. Russian *duša* ‘mind, soul, spirit’ : *dušit* ‘to smother’.

<sup>3</sup> Basque *-r* is a relic of the DC plural ending (see below).

'blood', Navajo *dít* 'blood', etc.

Basque *urdail* (*u-rdail*) 'stomach' ~ Karata *m-eǰu* 'stomach', etc. (NCED 670)

~ Burushaski *-úl* 'belly, abdomen'

Basque *uzki* (*u-z-ki*) 'anus' ~ ST: Tibetan *s-kyi-ša* 'anus' ~ Na-Dene: Haida *s-k'yáaw* 'tail';

Tlingit *k'í* 'rump, buttocks'

Basque *uk(h)abil* (< *\*u-khab-il*) 'fist' ~ Lezgi *k:ap, kapaš* 'hand', etc. (NCED 298)

Basque *ukondo* (*u-kondo*) 'elbow' ~ Hinukh *qontu* 'knee', etc. (NCED 925)

Basque (Bizkaian) *uzen* (*u-zen*) 'name' (contrasting with *izen* in common Basque)

~ cf. Burushaski *sénas* 'named'

Semantically, most of these words are body parts or fluids (blood). Contra Trask (1995: 74), body part words in more than one class is typologically usual. (Even in Indo-European such words may be masculine, feminine, or neuter.) This *o-/u-* prefix is likely to be cognate with PEC *\*u-* 'I-class singular' (Diakonoff & Starostin 1986; Nikolaev & Starostin 1991).

Another fossilized prefix takes the form of *ar-*, for example:

Basque (BN,Z) *arhan* (*ar-han*) 'plum' ~ Avar *géni* 'pear', etc. (NCED 475)

~ Burushaski *yáiy* 'grapes' ~ Tibetan *r-gun* 'vine, grape', etc. (ST V: 153)<sup>4</sup>

Basque *ardo* < *\*ardano* (*\*ar-dano*) 'wine' ~ Tindi *žana* 'wine', Archi *čon* 'wine', etc.

< PNC *\*ǰw[ǝ]nʔi* (NCED 1104)<sup>5</sup>

Basque (Z) *arsto* (*ar-sto*) = common Basque *asto* 'donkey' ~ Ubykh *čədə*,

Proto-Abkhaz *\*čāda* 'donkey' (Chirikba 1996: 314)

Basque (Z) *arska* (*ar-ska*) = common Basque *aska* 'crib, trough' ~ Ubykh *čáq'w'ə* 'basin, tureen', etc. (NCED 332) ~ Burushaski (Y) *čhiq* 'sifting tray' ~ PST *\*[č]ek'w* 'ladle' (ST IV: 70)

~ Ket *sí?k* 'trough for dough' etc. (SSEJ 275) ~ Na-Dene: Eyak *c'aak-ʔ* 'dipper', Navajo *c'aaʔ* 'plate', etc.

These words are all associated with agricultural products, implements, and domestic animals. *ar-* is probably to be compared with the East Caucasian prefix *\*r-* 'IV-class singular'. An example of the latter in fossilized form is found in the Lezgi word *rufun* (*ru-fun*) 'belly' (NCED 771).<sup>6</sup> A fossilized prefix *r-* is also frequent in Sino-Tibetan (see below).

Basque also has a fossilized prefix in the shape *a-*, for example:

Basque *ahizpa* (*a-hiz-pa*) 'sister (of a woman)' ~ Bezhta *is* 'brother', *isi* 'sister', etc. (NCED 669)

~ Burushaski *-čo* 'brother (of a man), sister (of a woman)' ~ PST *\*čəjH* 'elder brother or sister' ~ Na-Dene: Hupa *d-ehǰ* 'younger sister', etc.

Basque *atso* (*a-tso*) 'old woman' ~ Lak *c:u-* 'female', etc. (NCED 374)

Basque *azeri* (*a-zeri*) 'fox' ~ Tindi *sari* 'fox', etc. (NCED 324)

Basque *abere* (*a-bere*) 'domestic animal' ~ Udi *bele* 'cattle' (NCED 314)

Basque *ak(h)ain* (*a-khain*) 'tick' ~ PEC *\*ǰǎnʔV* 'louse, nit; worm' (NCED 911) ~ Burushaski *khin* ~ *khen* 'flea' ~ PST *\*kin* 'ant' (ST V: 55)

Basque (B) *abetxo* [*abečo*] (*a-betxo*) 'shrub' ~ PNC *\*wǝcV* 'grass' > Chechen *buc*, Adyge *wəcə*, etc. (NCED 1053) ~ Na-Dene: Tlingit *wás* 'bush'

Basque *ametz* (*a-metz*) 'gall oak' ~ Chechen *naž* 'oak tree' etc. (NCED 857) ~ Burushaski (Hunza) *meš* ~ (Yasin) *noš* 'bush, shrub, sapling'

Basque *aho* (*a-ho*) 'mouth' ~ PNC *\*χwi-* in *\*χwim(V)ǝV* 'mouthful' (NCED 1082) ~ PST *\*khʷǝ(H)* 'mouth, hole' (ST V: 107) ~ PY *\*χowe* 'mouth' (SSEJ 302) ~ Na-Dene: *\*χUʔ* 'tooth' > Tlingit *ʔúχ*, Eyak *χuu-ʔ*, Navajo *-γòðʔ* 'tooth', etc.

Basque *ahur* (*a-hur*) 'hollow of the hand' ~ PEC *\*kHwǝrV* 'hole, pit, ravine' > Dargwa *kur* 'pit', etc. (NCED 691) ~ PST *\*khʷǝr* 'fist, hollow of hand' (ST V: 106)

Basque *adar* (*a-dar* < *\*a-rǝar*) 'horn' ~ Avar *λ:ar* 'horn', etc. (NCED 771)

~ Burushaski (H) *-ltúr* 'horn'

Basque *aztal* (*a-z-tal*) 'heel' ~ Na-Dene: Eyal *tal* 'heel', Navajo *-tal* 'heel', etc.

These words refer to persons, animals, plants, and body parts. There is no apparent counterpart to this *a-* prefix among the East Caucasian class markers. *a-* could of course represent the trace of a class lost in the East Caucasian system, or it could correspond to the West Caucasian *\*a-* 'possessive prefix of third person singular', as for example Abkhaz *á-la* ~ *á-bla* 'its eye' (Chirikba 1996: 364f).

In addition to the prefixes already mentioned, there is another "leftover" element in Basque, *-z-*, that always appears *after* the other fossilized prefixes.

Basque *bizkar* (*bi-z-ka-r*) 'back' ~ Caucasian: Abkhaz *azk'w'a* 'back' ~ Burushaski *-sqa* 'on one's back' ~ ST: Tibetan *s-ku* 'body' ~ Na-Dene: Haida *s-ku* 'back'

Basque *iztai* (*i-z-tai*) 'groin' ~ Caucasian: Adyge *š'w:t.ə* 'genitals' ~ Burushaski (Y) *-štinj* 'loins, waist'

Basque *izter* (*i-z-te-r*) 'thigh' ~ Avar *het'é / het* 'foot', etc. < PEC *\*tʷiǝV* (NCED 1007)

~ Burushaski *-úǰ* ~ *-úǰis* ~ *-húǰes* 'foot' ~ PST *\*tǝH* > Old Chinese *\*təʔ* 'foot, heel' (ST II: 123) ~ Na-Dene: Haida *s-r'áay*, *s-r'a-* 'foot'

Basque *uzki* (*u-z-ki*) 'anus' ~ ST: Tibetan *s-kyi-ša* 'anus' ~ Na-Dene: Haida *s-k'yáaw* 'tail';

Tlingit *k'í* 'rump, buttocks'

Basque *aztal* (*a-z-tal*) 'heel' ~ Na-Dene: Eyal *tal* 'heel', Navajo *-tal* 'heel', etc.

We think this *-z-* is identical with the prefix *s-* that is frequent in Sino-Tibetan and Na-Dene (Haida):

At this point we will return to the sibilant prefix mentioned above from the perspective of Basque (*bizkar* 'back', etc.). This *\*s-* is most abundantly attested in one Na-Dene language (Haida) and in some Sino-Tibetan languages, as shown in some striking comparisons of Haida and Tibetan:

Haida <i>s-qál</i> 'shoulder'	~	Tibetan <i>s-gal</i> -(pa) 'small of the back'
<i>s-ku</i> 'back'	~	<i>s-ku</i> 'body'
<i>s-kyáaw</i> 'tail'	~	<i>s-kyi-ša</i> 'anus'
<i>s-q'ut</i> 'armpit'	~	<i>s-ked</i> -pa 'waist'

<sup>4</sup> Note the same prefix (as well as same root) in Basque *ar-han* 'plum' and Tibetan *r-gun* 'grape'.

<sup>5</sup> Nikolaev & Starostin (1991) previously reconstructed this word as *\*ǝwǝnʔi*, which is even closer to the Basque word (*\*.dano*).

<sup>6</sup> The class system is lost in Lezgi, while it persists in some other Lezgian languages such as Tabasaran, Rutul, etc. (Catford 1977).

*s-gil* ‘navel’ ~ (Balti)<sup>7</sup> *s-kil* ‘center’

We find the most plausible explanation for these fossilized prefixes is that they are “stage III articles” (Greenberg 1978), that is, prefixes that once marked class distinctions and remained as phonetic segments after the morphological meaning was lost. Within Dene-Caucasian the most abundant supply of stage II articles is found in Sino-Tibetan, for example:

Tibetan *m-čhin* ‘liver’, *b-žin* ‘face’, *r-nag* ~ *s-nag* ‘pus’, *d-gun* ‘winter’,  
*l-ga* ~ *s-ga* ‘ginger’, *s-ked-pa* ‘waist’, etc.

In some Sino-Tibetan languages a vowel has developed between prefix and stem, convergent with the development in Basque (*be-/bi-*):

Garó *bi-bik* ‘bowels’, *bi-bal* ‘flower’, *bi-mik* ‘sprout’, *bi-tši* ‘egg’, etc.

In the Caucasian languages relics of stage III articles appear more sporadically, for example:

Avar *mi-šír* ‘wing’, *ma-xá* ‘abomasum’, *me-géž* ‘beard’; Lezgi *ru-fun* ‘belly’;  
Tsakhur *wu-xun* ‘belly’; Ubykh *t-χamə* ‘skin, fur’, *t-χ<sup>w</sup>a* ‘ashes’, *b-ḥa* ‘eye’, *b-ḥá* ‘top’, etc.

Trask (1995: 73-74) objects that many Basque nouns carry no “fossilized prefixes” at all, which is true. However, as we can see from the Caucasian and Sino-Tibetan examples, it is typical of stage III articles that they appear “with some nouns but not with others in a quite sporadic way that differs from language to language” (Greenberg 1978: 47). For example, Basque *hur* ‘hazelnut’ vs. *a-hur* ‘hollow of hand’; *lur* ‘earth’ vs. *e-l(h)ur* ‘snow’; *larri* ‘sadness’ vs. *be-larri* ‘ear’. Cf. also Tibetan *gun* ‘loss’ vs. *r-gun* ‘vine, grape’, *d-gun* ‘winter’. These examples and others suggest that some stage III articles serve to distinguish homonyms.

The Basque, Caucasian, and Sino-Tibetan prefixes can tentatively be correlated as follows:

Basque	Caucasian <sup>8</sup>	class	Sino-Tibetan
<b>o-/u-</b>	<b>*u- (w-)</b>	I	<b>(m-)</b>
<b>e-/i-</b>	<b>*j-</b>	II	<b>g-</b>
<b>be-/bi-</b>	<b>*w- (b-/m-)<sup>9</sup></b>	III	<b>b- / m-</b>
<b>ar-</b>	<b>*r-</b>	IV	<b>r-</b>
	<b>*T- (d-)</b>	-	<b>d-</b>

This is only a preliminary attempt to correlate the class systems of these diverse families that diverged millennia ago. In addition, the class systems in Basque and Sino-Tibetan were already obsolete by the time the languages were recorded. More research is needed to further develop these ideas.

<sup>7</sup> Balti (Sbalti) is a Tibetic (Bodic) language spoken in northeastern Pakistan, adjoining the homeland of Burushaski speakers.

<sup>8</sup> The asterisked forms are those proposed for Proto-East Caucasian by Diakonoff & Starostin (1986). Schulze-Fürhoff (1992) posits *\*w*, *\*y/r*, *\*b*, *\*d* for Diakonoff’s *\*u*, *\*j*, *\*w*, *\*r*, respectively. *\*T* is restricted to West Caucasian, for example: Ubykh *t-χamə* ‘skin, fur’, *t-χ<sup>w</sup>a* ‘ashes’, etc.

<sup>9</sup> *m-* appears sporadically, for example: Avar *mi-šír* ‘wing’, *ma-xá* ‘abomasum’, *me-géž* ‘beard’, etc.