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THE HIGHER NUMERALS IN OSSETIC

Abstract

This paper examines the formal prehistory of the cardinal numerals above "ten" from Proto-Iranian to Ossetic. Despite the widespread adoption in Ossetic of a vigesimal system of counting and semantic shift of "thousand" and "ten thousand" to generalized terms for large amounts, the evolution of these numerals may be reconstructed in detail. Noteworthy features are the general conservatism of the teens; retention of the nasal from Proto-Indo-Iranian in Digor *insæj* 'twenty', *ærtin* 'thirty' (cf. Vedic *viṃśatí-*, *triṃśát-*); survival of an older variant of 'forty' in Digor *cæppors**, Iron *cyppurs* 'Christmas' < '(festival) of forty (days)'; and extension of Proto-Iranian **-āti* from 'seventy' and 'eighty' to 'fifty' and 'sixty'. Digor *be(u)ræ*, Iron *biræ* 'many, much; very' continues a thematized plural **baiwar-ai* of Proto-Iranian **baiwar/n-* 'ten thousand'; if *sædæ* 'hundred' and *ærzæ* (*ærʒæ*) 'countless number, myriad' < 'thousand' also go back to preforms in **-ai*, they were either remodeled after **baiwar-ai* or generalized from duals, e.g. **duwai ćatai* 'two hundred'. The limited evidence for earlier stages of the language is given full consideration, including Sarmatian onomastics, word lists in early modern European sources, and the testimony of loanwords.

Following upon the author's investigation of the cardinal numerals "one" to "ten" in Ossetic (Kim 2020), the present study examines the formal prehistory of the higher numerals, namely the teens, decads, and reflexes of "hundred", "thousand", and "ten thousand".[1] Whereas the previous installment devoted special attention

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to the role of sandhi developments, the focus here will be on the value of Ossetic evidence for the reconstruction of Proto-Iranian, particularly the teens (§1) and decads (§§2.1, 2.3–2.5). Despite the widespread adoption of a vigesimal system of counting (§2.2) and semantic shift of "thousand" and "ten thousand" to generalized terms for large amounts (§§3.2–3.3), it will prove possible to elucidate in detail the evolution of the decads, "hundred" (§3.1), and higher units from Proto-Iranian to Ossetic. The limited evidence for earlier stages of the language is given full consideration, including Sarmatian onomastics, word lists in early modern European sources, and the testimony of loanwords.

1. The teens

The numerals "eleven" to "nineteen" are formed in the inherited manner, as compounds with second element reflecting PIr. *daća 'ten'.[2]

jeuændæs/iuændæs 'eleven': the -*n*- is found throughout Old, Middle, and Modern Iranian: Av. *aēuuaṇdasa** (*aēuuaṇdasa*- 'eleventh'), Pth. *ēwanδas*, CSo. *ywnts*, Khw. *'ywnd(y)s*, Zaza *žondes*, Parāčī *ž(u)'wǭs, žŭ'(w)ǭṣ, žūǫ̣s, žu'uns*, Ōrmuṛī *šándas*.[3] Together, these forms point to PIr. *aiwan-daća*, based on neut. *ai-wam* 'one'.[4]

duuadæs/dyuuadæs 'twelve': the synchronically irregular linking vowel -*a*- is an archaism continuing the *-*ā*- of PIr. *dwā-daća*, formed to masc. *d(u)wā* 'two'. Likewise continuing *-*ā*- are Pth. *dwāδes*, MSo. *δw'ts*, Khw. *'δw's*, Khot. *d(u)vāsu*, Pto. *d(w)ólas*, Parāčī *d(u)'wās*, Ōrmuṛī *dwâs*;[5] cf. Av. *duua.dasa*, Ved. *dvádaśa*.[6]

Where two Ossetic forms are separated by a slash, the first is in the Digor dialect, the second in Iron. Abbreviations: Arm. = Armenian; Av. = Avestan (Younger unless otherwise indicated); B, C, MSo. = Buddhist, Christian, Manichean Sogdian; Bac. = Bactrian; CGo. = Crimean Gothic; D = Digor; Gr. = Greek; Hu. = Hungarian; I = Iron; Khot. = Khotanese; Khw. = Khwarezmian; Lat. = Latin; ModP = Modern Persian; MP = Middle Persian; (P)Oss. = (Proto-)Ossetic; PIE = Proto-Indo-European; PInIr. = Proto-Indo-Iranian; PIr. = Proto-Iranian; Pth. = Parthian; Pto. = Pashto; Toch. = Tocharian; Ved. = Vedic.

[2]   On the teens in Iranian in general, see Schmitt (1994). Here and below, the Pth. and MP forms are taken from Durkin-Meisterernst (2014: 217–221, 460–466), the Khw. forms from Èdel'man (2008: 33) and Durkin-Meisterernst (2009: 348).

[3]   The (southern) Zaza form is from Paul (2009: 554). The Parāčī and Ōrmuṛī forms are those given by Morgenstierne (1929: 59–60, 304b, 346, 408a); cf. Parāčī *ž(w)ōns* (Efimov 1999a: 270; 2009: 61), Ōrmuṛī (Logar) *šándas*, (Kaniguram) *sándas* (Efimov 1986: 159 [2011: 140]; 1999b: 289; Kieffer 2003: 130). Kieffer (2009: 700) gives Parāčī *žūwōs*, with apparent denasalization.

[4]   See Szemerényi (1960: 53fn. 58); Èdel'man (1990: 47, 190); Emmerick (1992: 301–302); Schmitt (1994: 18–20); Cheung (2002: 195). On the Pth. and Khw. forms, see respectively Benveniste (1936: 196) and Henning (1958: 118).

[5]   According to Morgenstierne (1929: 59–60, 252a, 346, 393b); cf. Parāčī *d(o)wắs* (Efimov 1999a: 270; 2009: 61), *dowās* (Kieffer 2009: 700) and Ōrmuṛī (Logar) *dwâs*, (Kaniguram) *dwās* (Efimov 1986: 159 [2011: 140]; 1999b: 289; Kieffer 2003: 130).

[6]   See Abaev (*Dict*. I: 385); Emmerick (1992: 302); Schmitt (1994: 20–21). The Iron form *duvädäs* given by Miller (1903: 48 §55) is an error, corrected to *dyuuadæs* (дуӳадӕс) in M/F (*Dict*. I: 517).

ærtindæs/ærtyndæs 'thirteen': for PIr. **θrī-daća* (Av. *θridasa**, *θridasa-* 'thirteenth'), formed to neut. **θrī* 'three'. The nasal has spread from "eleven" (Tedesco 1922: 296, 298; Abaev *Dict.* II: 428; Schmitt 1994: 22) as well as "fifteen" (Miller 1903: 39 §47); cf. Szemerényi (1960: 53); Emmerick (1992: 303). The influence of *ærtin* 'thirty' could also have played a role (Èdel'man 1990: 190; see below, §2.3).[7] MP *sēzdah*, Pth. *hrēδas** go back to a different PIr. formation **θrayas-daća* based on masc. **θrayah* 'three' (Emmerick 1992: 303; cf. Ved. *tráyodaśa*).

cuppærdæs/cyppærdæs 'fourteen': the expected reflex of PIr. **čaθru-daća* (Av. *caθru. dasa**, *caθru.dasa-* 'fourteenth', Khw. *cwrδ(y)s*)[8] has been remodeled,, as in most Middle and Modern Iranian languages. The first component looks to be from **čaθwar-*, as in Khot. *tcahaulasu* (Emmerick 1992: 303); but remodeling on the basis of **čaθwār* 'four' (> Oss. *cuppar/cyppar*) as in Pth. *čafārδas*, MP *čahārdah* is more probable (Abaev *Dict.* I: 322; Schmitt 1994: 22; Cheung 2002: 79, 176). Pace Abaev (*Dict.* I) and Schmitt (1994), the weakening of *a > æ* is not "regular", but has been introduced on the basis of inherited examples of *a ~ æ < pre-POss. *ă*, as in *cuppæræjmag/cyppæræm* 'fourth' and compounds of "four", e.g. *cuppær-k'axug/cyppær-k'axyg* 'four-footed', I *cyppær-ӡæstyg* 'four-eyed' (Thordarson 2009: 105).[9]

finddæs/fynddæs 'fifteen': from PIr. **panča-daća* (Av. *paṇca.dasa*) with regular syncope of **-a-* in the open second syllable of a tetrasyllabic preform (Cheung 2002: 77). The raising of **a > *i* in the first syllable is conditioned by the palatal **č* (cf. *itinӡun/týnӡyn* 'stretch' < PIr. **wi-θanǰ-*),[10] hence must predate syncope and assimilation of the resulting cluster **nǰd*. The *æ* of *fænӡæjmag/fænӡæm* 'fifth' would then have to be analogical after **fanӡ* 'five' (< PIr. **panča* with syncope in sandhi; Kim 2020: 259).

æxsærdæs 'sixteen': from PIr. **xšwaš-daća* [žd] (Av. *xšuuaš.dasa**, *xšuuaš.dasa-* 'sixteenth'). CSo. *xwšrts*, Khw. *'xrδ(y)s*, Pto. *špā́ṛas*, and the Ōrmuṛī forms[11] attest to a widespread conditioned shift of **ž > *r* (Skjærvø 1989: 379; Èdel'man 1990: 191; Emmerick 1992: 304; Schmitt 1994: 24; Morgenstierne 2003: 80),[12] but early modern Oss. forms with sibilant argue for an independent innovation, see below. The *-r-* could then simply be analogical on "fourteen" (Miller 1903: 32 §34.3 Anm., 39 §47; Tedesco 1922: 296).

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[7] Cf. the spread of the nasal in ModP from *pānzdah* 'fifteen' to *šānzdah* 'sixteen' and colloquially to *yā(n)zdah* 'eleven', *davā(n)zdah* 'twelve', *sī(n)zdah* 'thirteen', *nū(n)zdah* 'nineteen', whence conversely nasalless *pāzdah* (Schmitt 1994: 19, 20–21, 21, 23, 24, 26).

[8] On the Khw. form, see Emmerick (1992: 303). In Èdel'man (2008: 33 "**čaθu̯ar-daśa-* или скорее **catur-daśa-*, ср. ав. *caθru-daśa-* … "), **čatur-daśa-* must be a misprint for **čaθru-daśa-*.

[9] Cf. other examples of secondary *æ* alternating with *a* (*o* before nasals) *< pre-POss. *ā* such as *xæzar* 'house', pl. *xæзærttæ*; *don* 'river', pl. *dænttæ/dættæ*; or *arv* 'heaven', adj. *arv-on ~ ærv-on* (Kim 2003: 65 with refs.).

[10] See Miller (1903: 18); Bailey (1945: 5); Thordarson (1989: 460); and already Hübschmann (1887: 84)!

[11] Morgenstierne (1929: 347) gives *šū'lēs*, Efimov (1986: 159 [2011: 140]; 1999b: 289) *xalés* (Logar), *šóles*, *šwalés* (Kaniguram), and Kieffer (2003: 130) additional dialect forms, all with *-l- < *-rd-*.

[12] There is thus no need to consider the *-r-* of the CSo. form as "parasitic", pace Reczek (1974: 187 [1991: 115 "nieorganiczny"]). On Khw. *'xrδ(y)s*, see Henning (1958: 118; 1971: 32a).

ævddæs 'seventeen': apparently from PIr. **hafta-daća* (Av. *hapta.dasa**, *hapta.dasa-* 'seventeenth') with regular syncope of **-a-* in the open second syllable of a tetra-syllabic preform, if not a secondarily created compound of *avd + dæs* (see below on 'eighteen'). The *æ* in the first syllable is expected, cf. *ævdæjmag/ævdæm* 'seventh' and compounds of 'seven', e.g. *ævd-særon* 'seven-headed' (Kim 2003: 64–65; Thordarson 2009: 105).

æstæs, *æstdæs* 'eighteen': from (post-)PIr. **ašta-daća* (Av. *ašta.dasa**, *ašta.dasa-* 'eighteenth'), in turn for PInIr. **aštá-daća* (Ved. *aṣṭā́daśa*): cf. Pth. *haštδas**, MP *haštdah*, BSo. *ʾštδs*, CSo. *šts* (*šttsmyq* 'eighteenth'). Since word-final **-ă* merged with **-ā* in most of Iranian, the short linking vowel must be due to the influence of "fifteen", "seventeen", and "nineteen" (Reichelt 1909: 214–215; pace Emmerick 1992: 299–300, 304). As in those numerals, syncope of **-ă-* would be regular in Ossetic, though an analogical compound of *ast + dæs* cannot be excluded (Cheung 2002: 79).

næudæs/(æ)nudæs 'nineteen': from POss. **nodæs* < PIr. **nawa-daća* (Av. *nauua.dasa**, *nauua.dasa-* 'nineteenth') with regular syncope as in "fifteen", "seventeen", and "eighteen". The Iron form continues POss. **nodæs* (Cheung 2002: 78), whereas D *næudæs* was remade after **næw* 'nine' before the latter was replaced by *farast* (orig. 'beyond eight').[13] The Iron variant with initial *æ-* is most certainly not an archaism,[14] but has simply been taken over from *æxsærdæs*, *ævddæs*, *æstdæs* (Èdel'man 1990: 191; Schmitt 1994: 26; Cheung 2002: 209).

Early Ossetic forms of these numerals are included in the mixed Kabardian-Ossetic word list compiled in 1688 and published by Nicolaes Witsen in the second edition of his *Noord en Oost Tartarye* (1705: 528), but they must unfortunately be regarded as highly unreliable. Following "one" to "ten" (*jouff*, *dwa*, *artâ*, *d'zupár*, *fonz*, *accaz*, *aft*, *ast*, *farrast*, *dest*), the list gives the following for "eleven" to "nineteen": *jouffdest, duodest, artadest, d'zupardest, fonsdest, accesdest, affdest, astdest, farrasdest*.[15] As noted by Thordarson (2009: 255), the form *farrasdest* 'nineteen', presumably for †*faræstdæs*, finds no support in any other source; in any case, it would have to be an innovation with respect to *næudæs/(æ)nudæs*. The absence of *-n-* in *jouffdest* and *artadest* and the vocalism of *fonsdest* are also unexpected (cf. modern *jeuændæs/iuændæs*, *ærtindæs/ærtyndæs*, *finddæs/fynddæs*), as is *accesdest* with *-s-* [-z-] for the *-r-* of *æxsærdæs*. With the possible exception of *duodest*, which may stand for /duwadæs/ (cf. modern *duuadæs/dyuuadæs*), the whole set gives the impression of having been created by a less than proficient speaker who simply suffixed "ten" to the unit forms.

In contrast, the "Dugorisch" and "Ossetisch" (i.e. Iron) forms included in the word list of Güldenstädt (1791: 537) are recognizably close to their modern equivalents:

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[13] See Kim (2020: 259–260) with refs., to which add Èdel'man (1999: 225).

[14] Pace Abaev (*Dict*. II: 192). Gr. *ἐννέα*, Arm. *inn* 'nine' are now universally considered to go back to PIE **h₁néwṇ* with initial laryngeal, although some difficulties remain; see Peters (1991); Martirosyan (2010: 302) with refs.

[15] See Lavrov (1957) and the bilingual Dutch and Russian digital edition at http://resources. huygens.knaw.nl/retroboeken/witsen.

D *Javan des* / I *Ju des*, *Dua des*, *Artin des*, *Zuppar des*, *Fintes*, *Achsar des*, *Aaftes*, *Astes*, D *Naudes* / I *Nudes*. Aside from the missing nasal of I *iuændæs*, all the main features identified above may be recognized, showing that they must have present in Ossetic by the time of Güldenstädt's travels through the Caucasus in the years 1770–1773. The grammar of Sjögren (1844a: 101; 1844b: 168) has the modern forms as expected, with some inconsistencies in vowel notation, e.g. D дуондес (*juondes*), артундес (*artundes*) for modern *jewændæs*, *ærtindæs*; I дуӕдӕс (*duædæs*) for modern *duadæs*. The only surprise is D ахсаздес (*axsazdes*) / I ахсӕздӕс (*axsæzdæs*) 'sixteen', whose *-z-* recalls *accesdest* in Witsen's word list. If this is not an error, it suggests that the *-r-* of Güldenstädt's *Achsar des* and modern *æxsærdæs* only came into being in the 18th century and did not become general until the 19th.

2. The decads

2.1. "Twenty"

D *insæj* / I *(y)ssæȝ* 'twenty' < POss. **insædʸ* to all appearances continues PIr. **winćati*, with the same treatment of word-final **-ti* > POss. **-dʸ* > D *-j* / I *-ȝ* found in e.g. PIr. **kutī-* 'bitch' > POss. **kudʸ* > *kuj/kʷyȝ* 'dog' or PIr. **ā-fa-ti-* 'movement (of time)' > POss. **afædʸ* > *afæj/afæȝ* 'year'.[16] The Sarmatian proper name ΙΝΣΑΖΑΓΟΣ (Olbia) indicates that the changes **wi-* > **i-* and **-ti* > **-dʸ* had taken place by the early centuries AD.[17] The dialectal reflexes were in place no later than the 18th century, since they are attested in Güldenstädt (1791: 537), who gives D *Insei* and I *Seds*; cf. likewise D *Kui* / I *Kutz* (539) for modern *kuj/kʷyȝ* 'dog'. Note that since syncope would not have occurred once **-i* was lost by apocope (Cheung 2002: 69–77), these forms tell us nothing about the placement of stress in pre-Oss., pace Morgenstierne (2003: 78 "< **wisʹati*").

The most notable feature of this numeral is the nasal, which matches Ved. *viṁśatí-* 'id.' but is isolated within Iranian, where we find Av. *vīsaiti*, Pth., MP *wīst*, Bac. οιστο,[18] CSo. *wyst** (*wystmyq* 'twentieth'), Khot. *bistä*, Pto. *(w)šəl*, etc. Outside of Indo-Iranian, Gr. (Attic-Ionic) εἴκοσι, (Doric) ϝίκατι, Lat. *vīgintī*, Arm. *kʿsan*, Toch. B *ikäṃ*, A *wiki* may all be derived from PIE **h₁wih₁ḱm̥tih₁* (← pre-PIE **dwih₁ dḱm̥tih₁* 'two tens'), with no trace of a nasal in the first syllable.

As a result, scholars ever since at least Bartholomae (1895: 26 §62.1) have pondered "die Möglichkeit rückläufiger Entwicklung" for both the Ossetic and the Old Indo-Aryan forms. Szemerényi (1960: 55; cf. Mayrhofer *KEWA* III: 200; *EWAia* II: 551) argued that the "curious nasal" of Digor must be dissimilated from **-ss-*, adducing as a parallel *funx/fyx* 'cooked' < PIr. **paxwa-* (Khot. *paha-*, cf. Ved. *pakvá-* 'cooked,

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[16] On these and other cases of the correspondence D *-j* ~ I *-ȝ*, see Miller (*Oss. St.* II: 106); Hübschmann (1887: 94); Cheung (2002: 98–99); Kim (2007: 60–64).

[17] See Miller (*Oss. St.* III: 80); Vasmer (1923: 28, 41 [1971: 127, 139]); Abaev (1949: 188); Harmatta (1951: 261–262, 307; 1970: 58, 93).

[18] These and other Bac. forms are taken from Gholami (2014: 84–89); see the references cited there, in particular the glossary to Sims-Williams (2007).

ripe'; Bailey 1956: 118). But this is hardly cogent evidence against the antiquity of D *insæj*; note that *funx* and other examples of unoriginal nasal in Digor involve a following velar rather than *s*, including *fudonx* 'grief', *æxsijnængæ* 'dove' [I *fydox*, *æxsinæg*].[19] As for Ved. *viṁśatí-*, Szemerényi (1960: 55–56) proposed metathesis in **trīsant-*, **čatvārī̆śant-* → *triṃśát-* 'thirty', *catvāriṃśát-* 'forty', whence **vīśati-* → *viṁśatí-*; whereas Peters (1991: 305fn.21) simply takes *-iṃś-* to be "hyperkorrekt für älteres **-īś-*" (cf. Wackernagel, Debrunner 1930: 366; Mayrhofer *KEWA* III: 200; *EWAia* II: 551). More recently, Rau (2009: 27) considers the nasal "a minor phonetic development that affected part of the Proto-Indo-Iranian speech community"; similarly Weiss (2020: 395fn.46 "[t]he nasal is secondary and the result of spontaneous nasalization"), although he admits the possibility of a Proto-Indo-Iranian date.

The problem has been placed into a new perspective by Kümmel (2011; forthcoming: §2.5), who argues that the loss of nasals before fricatives was not Proto-Iranian, since it did not affect the northern Iranian dialects, namely Alanic and Sogdian. The change was complete already in Avestan after high vowels (e.g. Old Av. acc. pl. masc. *-īš*, *-ūš* < **-ins*, **-uns* or 1pl. *cīš-mahī* < **ci-n-š-*, nasal-infixed present to *ciš-* 'assign'),[20] but early Sogdian preserves the nasal in *np'yns-* [nəpĭⁿs-] 'write (down)'[21] < PIr. **pinća-* 'adorn, paint; write' (cf. Ved. *piṁśá-* 'cut out, form, adorn'), vs. later BSo. *np'ys-*, C, MSo. *npys-* [nəpīs-]. Ossetic likewise retains the nasal in *finsun/fyssyn* 'write' < POss. **fins-*; the assimilation of **ns > ss* in Iron is of course a later and separate change.

I thus conclude with Benveniste (1959: 75, 102–103) and others that the Ossetic forms of "twenty" are an archaism within Iranian and continue PInIr. **winćati*.[22] As for the source of the nasal, it cannot be inherited from PIE, as noted above (pace G. Schmidt 1970: 128); and a fossilized case form of "two" would be both unmotivated and isolated among the decads.[23] Kümmel (2011) proposes a conditioned development of **d* in PIE **h₁widḱm̥tih₁* > PInIr. **winćati*, which is phonetically not impossible, but lacks parallels.[24] More plausible in my opinion is anticipatory assimilation to the syllabic nasal in pre-Proto-Indo-Iranian: PIE **h₁wih₁ḱm̥tih₁* > pre-PInIr. **wīćati-* → **wi̧ćati-* > PInIr. **winćati-*, whence Ved. *viṁśatí-*, POss. **insæd^y* > Oss. *insæj/ssæʒ*.

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[19] D *fons* / I *fos* 'cattle, property' does not go back to PIr. **paću-*, pace Szemerényi (1960: 54fn.67); according to Abaev (*Dict.* I: 479), it is rather a borrowing from Avar *panz* 'horned cattle'. The regular reflex of PIr. **paću-* is *fus/fys* 'sheep', with *u*-umlaut of **a > *u* next to a labial consonant as in *fur/fyr* 'much, many', *mud/myd* 'honey' < PIr. **paru*, **madu* (Cheung 2002: 124–126; Kim 2003: 62).

[20] See already J. Schmidt (1889: 275); Brugmann (1890: 25–26); Bartholomae (1890: 74).

[21] Attested in Ancient Letter V, R5; cf. Grenet, Sims-Williams, and de la Vaissière (1998: 95).

[22] See Henning (1965: 43fn.3); Bielmeier (1977: 214–215; 1982: 62fn.13); Kim (2007: 62; cautiously Emmerick (1992: 305); Weiss (2020: 395fn.46). So also already Bartholomae (1895: 111 §210); Brugmann (1909: 31fn.1 "[a]uf eine Form mit urar. *nś* weist auch oss. *insäi*"); Wackernagel, Debrunner (1930: 365–366).

[23] So Brugmann (1890: 25–26; 1909: 31); Wackernagel, Debrunner (1930: 366); cf. Bartholomae (1924: 134–136); Èdel'man (1990: 46) on **trī-* → **trīn-* in 'thirty', whence **wīn-* 'twenty', to which see the objections in Szemerényi (1960: 55–56).

[24] See also Henning (1965: 43fn.3); Abaev (*Dict.* IV: 277); and already Ahrens (1859: 349)!

2.2. Vigesimal vs. decimal systems

Several Modern Iranian languages have acquired a vigesimal system of counting, including Waxī and Yidgha/Munji (Emmerick 1992: 311–313) and Eastern Balochi (Korn 2006: 206–207).[25] In Ossetic, most varieties had adopted vigesimal counting by the modern period, probably spurred by contact with neighbouring Caucasian languages: hence D *dæs æma insæj* / I *dæs æmæ ssæʒ* 'thirty' (lit. 'ten and twenty'), D *duuinsæʒi* / I *dyuuissæʒy* 'forty' (lit. 'two twenties'), D *dæs æmæ duuinsæʒi* / I *dæs æmæ dyuuissæʒy* 'fifty' (lit. 'ten and two twenties'), D *ærtinsæʒi* / I *ærtissæʒy* 'sixty' (lit. 'three twenties'), etc., with 'two hundred' being rendered D *dæsinsæʒi* / I *dæsyssæʒy* (lit. 'ten twenties') or more often D *duuæ fonʒinsæʒi* / I *dyuuæ fonʒyssæʒy* (lit. 'two (times) fifty twenties').[26] The forms recorded by Güldenstädt (1791: 537) confirm that vigesimal counting was established in the 18th century in both dialects: D *Desama insei* / I *Desama seds* 'thirty', D *Duin sedshi* / I *Dui sedsi* 'forty', D *Desama Duinsedshi* / I *Desama Duisedsi* 'fifty', D *Artin sedshi* / I *Arti sedsi* 'sixty', etc.; D *Des insedshi* / I *Dessissedsi* 'two hundred'. Similar forms were listed by Sjögren (1844a: 101–102; 1844b: 169), except that for "two hundred" he gave D дуа сæдij (*dua sædij*, lit. 'two hundreds') beside I дуæ фондзвсæдзvj (*duæ fonʒysæʒyj*).

However, the inherited decimal forms survived among shepherds in certain mountainous districts of Digoria (Frejman 1934: 562) and were borrowed into the speech of the neighbouring Balkar herders; these were reintroduced into the standard language by the new Soviet authorities in 1925.[27] The prehistory of the higher decads must therefore be based on these Digor shepherds' numerals, along with a fossilized survival of "forty" (§2.4).[28]

2.3. "Thirty"

D *ærtin* 'thirty' goes back to PIr. *$\theta rin\acute{c}at$-, with "mysterious" nasal as in Ved. *triṁśát-* (Szemerényi 1960: 52). Most other Indo-European languages continue the PIE collocation *$trih_2$ (d)$k̂ómt$ 'three tens' (Toch. B *täryāka*, Gr. τριάκοντα, Arm. *eresown*, Lat. *trīgintā*), but the Indo-Iranian forms go back to a feminine abstract-collective compound *tri-$h_1k̂ómt$- ~ *-$h_1k̂m̥t$-´ < pre-PIE *-$dk̂ómt$- ~ *-$dk̂m̥t$-´ (Rau 2009: 16–19, 26–28).[29] The nasal must have been taken over from "twenty" in Proto-Indo-Iranian;[30]

[25] For a fuller list, see Èdel'man (1999: 221–222; 2006: 13–16).

[26] See Miller (*Oss. St.* II: 160; 1903: 48–49); Abaev (1964: 21; *Dict.* IV: 277); Kulaev (1964); Isaev (1966: 48–49); Èdel'man (1990: 195, 197); Emmerick (1992: 311–313); Chirikba (2008: 60); Pisowicz (2020: 80–85). The more recent Digor variants *duuinsæj*, *ærtinsæj*, etc. are usually used when modifying a noun (Isaev 1966).

[27] See Abaev (1949: 22, 282–283, 399); Axvlediani (1963: 145–147); Bagaev (1965: 211–212); Thordarson (1989: 471; 2009: 67). The descriptive grammars of Axvlediani (1963) and Abaev (1964: 21) list the decimal variants first, followed by the vigesimal system, whereas Bagaev (1965); Isaev (1987: 591–592); and Pisowicz (2020: 80–85) give the vigesimal numerals first.

[28] The following paragraphs expand upon the remarks in Kim 2007:62fn.38, with references to newer literature.

[29] As do *$k^wtwr̥$-$h_1k̂ómt$- ~ *-$h_1k̂m̥t$-´ 'forty' and *$penk^we$-$h_1k̂ómt$- ~ *-$h_1k̂m̥t$-´ 'fifty'; see below, §§2.4, 2.5.

[30] Unless it continues *d in PIE *tri-$dk̂ómt$-, as Kümmel (2011) has proposed for "twenty" (see above, §2.1).

its spread to Ved. *catvāriṃśát-* 'forty' was a later innovation of Indo-Aryan alone. The development in Iranian was the same as in "twenty" (§2.1): the nasal survived in Ossetic, but was lost elsewhere, including Avestan θrisąs, θrisatəm, Pth. *hrist*, MP *sīh*, Bac. υιρσο, Khw., C, MSo. *šys*. The shepherds' form was borrowed into literary Ossetic as *ærtyn*, and also served as the basis for the neologism *duuin/dyuuyn* 'twenty'.

As for the elision of the final syllable here and in 'forty' (see below, §2.4), Cheung (2002: 177) suggests that "it was analogically removed … especially if *°sat-* became associated with *sædæ* 'hundred'." However, the outcome may rather have been morphologically conditioned: note that Oss. reflexes of adjectives in *-mant-*, *-want-* apparently replaced PIr. nom. sg. *-māh*, *-wāh* with *-măh*, *-wăh* after the preponderant masculine *a*-stem inflection, as in *fusun/fysym* 'host, person who practices hospitality toward guests', *rædau* 'generous' < POss. *fusum*, *rædaw* < *fšumah*, *fradāwah* ← PIr. *fšu-māh*, *fra-dā-wāh* (Cheung 2002: 62). If the same remodeling occurred here, the development of "thirty" would have been PIr. *θrinćant-s → *trinsah > POss. *ærtins*. The subsequent irregular loss of *-s could have been generalized from rapid speech registers; in any case, D *ærtin* "was … sufficiently characterized without the final *-s*" (Szemerényi 1960: 52–53).[31]

2.4. "Forty"

D *cuppor* 'forty' < POss. *cuppor* must derive somehow from PIr. *čaθwŗćat- ← PIE *kʷtwŗ-h₁ḱm̥t-´ (MP *čehel*) or remodeled *čaθwarćat- (Av. *caθβarəsatəm*, CSo. *štfrs*, Khot. *tcahaulsä*), but the origin of the *o* is unclear. This form was adapted into the standard language as *cyppor*, for the expected Iron cognate †*cyppur* (Cheung 2002: 176–177); the correspondence D *o* ~ I *o* thus does not justify a preform *čaθwārinćat-* comparable to Ved. *catvāriṃśát-* (Emmerick 1992; pace Frejman 1934: 562).

As seen by Abaev (*Dict.* I: 323; 1970: 5; cf. Bielmeier 1982: 61–62), the regular reflexes of the Iranian numeral for "forty" survive in D *cæpporsæ** (gen. *cæpporse*) / I *cyppurs* 'Christmas; month from late November to December', originally 'a winter festival preceded by forty days of fasting', hence D *cæpporse* (*bærægbon*) '(festival) of Forty', I *cyppursy mæj* 'month of Forty, December'. Since the vowel of the first syllable in Iron can have been influenced by *cyppar* 'four', the Digor form must be older in this regard (Cheung 2002: 128, 177). We thus arrive at a POss. *cæppors(æ)*; the absence of *u*-umlaut in the first syllable, contrasting with *cuppar/cyppar* 'four' < PIr. *čaθwār*, suggests that *-pp-* has also been taken over from "four". As the only possible source for POss. *o* here is umlaut of *a* > *au* by a following *u*, the immediate preform of "forty" must have begun with *čaθaru-*.[32] This sequence presumably

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[31] However, since Szemerényi considered the nasal of D *insæj* 'twenty' to be secondary (see above, §2.1), he was forced to ascribe remodeling of "the expected form … *ærtis*" → *ærtins* to the influence of D *ærtindæs* 'thirteen'" (Szemerényi 1960: 53) and/or *ærtinsæʒi* 'sixty' (1960: 52fn.56), whence D *ærtin* with irregular loss of *-s*.

[32] Cf. PIr. *aruša-* 'white' (Av. *auruša-*) > *auruši > POss. *ors > uors/urs* 'white'; PIr. *paruta-* (Av. *pauruta-* [place name], Khw. *pwrd* 'sea') > *paurudi > POss. *ford > ford/furd* 'great river, lake' and see Cheung (2002: 75 "an early kind of metathesis").

resulted from a cross between *čaθwar- and the compound form čaθru- known from Av. caθru.dasa* 'fourteen' (§1), čaθrušuua- 'quarter', čaθru-gaoša- 'four-eared', etc.

   As for the ending, Abaev (*Dict*. I) assumed an underlying D nom. cæpporsæ*, with cæpporse from pronominally inflected gen. cæppors-e-j. However, the inherited Digor form could just as well have been cæppors*. The inflection of the numeral would have been identical in either case: cf. D ærtæ 'three', gen. ært-e-j and avd 'seven', gen. avd-e-j (see below, §3.3). As in "thirty" (§2.3), a zero ending would be the expected outcome of a remodeled PIr. *čaθwr̥-ćant-s → *čaθarusah → POss. *cæppors > D cæppors* / I cyppurs (with -y- from "four").[33] The final *-s survived in this specialized usage, but was dropped in D cuppor (→ I cyppor) as in ærtin (→ I ærtyn), producing a synchronically unique situation whereby "forty" differs from "four" only in the quality of the second vowel.

2.5. "Fifty" to "ninety"

The decads "fifty" through "eighty" show a unitary ending -aj in D fænʒaj, æxsaj, ævdaj, æstaj, which can continue POss. *-ad^y < PIr. *-āti. This represents an innovation with respect to PIr., which in turn has innovated from PInIr. Whereas "fifty" was formed in a similar manner to "forty", i.e. PInIr. *pančāćat- ← PIE *penkʷe-h₁ḱm̥t-´ (Av. pančasat-, Ved. pañcāšát-), the Indo-Iranian decads "sixty" to "ninety" were expressed by abstract-collective formations based respectively on "six" to "nine": (post-)PIE *sweĉs-tí-, *septm̥-tí-, *HoĉtH-tí-, *h₁newn̥-tí- 'group of six, seven, eight, nine (tens)' > PInIr. *swaští-, *saptatí-, (*HaćtHí- →) *HaćHtí-, *nawatí- > Ved. ṣaṣṭí-, saptatí-, aśītí-, navatí-.[34] Iranian remodeled the synchronically aberrant "eighty" to *aštāti- after *aštā 'eight', whence *haftāti- 'seventy': cf. Av. haptāiti-, aštāiti-, Pth., MP haftād, haštād, MSo. ʾβtʾt, CSo. štʾt, Khw. ʾβdʾc, ʾštʾc, Khot. haudātä, haṣṭātä.[35]

   Ossetic has simply extended the pattern of "seventy" and "eighty" to "fifty" and "sixty", replacing the reflexes of PIr. *pančāćat- and *xšwašti-.[36] For "fifty", the regular outcome of *pančāti- should have been D †finʒaj, cf. finddæs/fynddæs 'fifteen' < PIr. *panča-daća (§1). Like fænʒæjmag/fænʒæm 'fifth', fænʒaj must be analogical to *fanʒ > fonʒ 'five', remade after the innumerable a ~ æ alternations in the language. For "sixty", Emmerick (1992: 34fn.40) proposed dissimilation followed by remodeling:: *æxsæsti > *æxsæti → *æxsati > æxsaj. Also possible is an analogical formation

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[33] The alternative derivation from PIr. *čaθrušwa- 'quarter' itself (Cheung 2002: 128, 177) is both semantically unsatisfactory and phonologically impossible.

[34] See already Brugmann (1890: 33–34; 1909: 21). For details, see Viredaz (1997: 145); Rau (2003; 2009: 27 with fn. 51).

[35] I leave aside the question whether the cluster -pt- of Av. haptāiti- and hapta 'seven' is inherited from Proto-Iranian or reflects a later change of PIr. *-ft-; see Cantera (2017: 491) and, for the latter possibility, Kümmel (2007: 151) with typological parallels.

[36] So Abaev (*Dict*. I: 449); Emmerick (1992: 310); Cheung (2002: 99); Èdel'man (2006: 15). Pace Abaev (*Dict*. IV: 223), æxsaj cannot be a regular development of PIr. *xšwašti-.

based on "six" with syncope: *æxsæz-aj > *æxszaj > æxsaj (Frejman 1934: 562) or rather *æxsæs-aj > *æxssaj > æxsaj, since voicing of word-final *-s > -z was a late change (Kim 2020: 260–261).

In contrast, D næwæʒæ 'ninety' has not been altered after "seventy" and "eighty", but continues PIr. *nawati (Av. nauuaiti-, Khot. nautä, ModP navad). As this should have given POss. *næwædʸ > D †næwæj, the actually occurring næwæʒæ must have taken over the final *-æ of *sædæ 'hundred' (Cheung 2002: 56). This was adopted into the standard language as næwæʒ, without the characteristic D -æ. The Digor variants næwæʒ, næw are shortened byforms; once *næw 'nine' was replaced by farast (§1 s.v. "nineteen"), there would have been no danger of confusion with the clipped variant næw 'ninety' (Emmerick 1992: 311).

3. Larger numerals[37]

3.1. "Hundred"

The only inherited larger numeral in Ossetic is sædæ 'hundred', clearly related to PIr. *ćatam (Av. satəm, Bac. σαδο, CSo. stw; cf. Ved. śatám). A likely derivative is attested in the Sarmatian proper name ΣΑΔΑΙΟΣ (Olbia), perhaps meaning 'commander of a hundred men';[38] cf. also ΣΑΔΙΜΑΝΟΣ (Olbia), connected with the family of Oss. sædæ by Zgusta (1955: 140). By the modern period, sædæ survived only in Digor and in the Nart epics alongside vigesimal fonʒinsæʒi/fonʒyssæʒy (see Abaev Dict. III: 52–53 for examples). This is reflected in the word list of Güldenstädt (1791: 537), which has Ssadda beside Fonsinsedshi for Digor, but only Fonds sedsi for Iron;[39] similarly, Sjögren (1844a: 102; 1844b: 169) gave D фондзсæджиj or cæдæ ("fonʒsæʒij or sædæ") / I фондзвсæдзвj (fonʒysæʒyj). Like the Digor decads, sædæ was introduced into the literary language in the 20th century and is now considerably more common than fonʒyssæʒy.[40]

The problem with Oss. sædæ is that the final -æ cannot go back to PIr. *-ám, which became -Ø in both dialects:[41] cf. æz 'I', ærzæt 'ore', fæd 'footprint', myzd/mizd 'wages, compensation' < PIr. *ajám, *r̥jatám 'silver', *padám, *miždám (Av. azəm, ərəzatəm, paδəm, miždəm; cf. Ved. ahám, rajatám, padám, mīḍhám). The antiquity of this final vowel is supported by CGo. sada, which must have been borrowed from Alanic

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[37] The following section has been greatly expanded and thoroughly revised from the cursory remarks in Kim 2007:54fn.19.

[38] See Vasmer (1923: 49 [1971: 147]); Abaev (1949: 181). The Σαδατος in Abaev (Dict. III: 53) is a misprint for Σαδαῖος.

[39] The Ossetic word list in P. S. Pallas's Linguarum totius orbis vocabularia comparativa, which is in the main based on Güldenstädt's data, incorrectly gives Задда for both dialects after "Ossetic" (i.e. Iron) фонсь-зеджи, Digor фонсьиньзеджи (Pallas 1789: 479; cf. Bielmeier 1979: 128).

[40] A search of the Ossetic National Corpus returns 1340 hits for cæдæ and 131 for cæдæйы, as opposed to just 283 for фондзыссæдз and 64 for фондзыссæдзы. The dominance of sædæ is almost complete in contemporary Digor: the Digor Ossetic Corpus returns 389 hits for cæдæ and 16 for cæди, but only 23 for фондзинсæй (and 1 for фондзинсæдзи, in an article on numerals).

[41] Pace Fortunatov apud Miller (1903: 16–17 §3.6); Èdel'man (1990: 189).

or a closely related variety (Abaev *Dict.* III: 53). However, since CGo. reduced all unstressed vowels to /ə/, here spelled ‹a› (Stearns 1978: 90–91), this loanword cannot tell us anything about the historical source of the ending of *sædæ*.

Taken by itself, D *sædæ* could continue POss. *sædæ < PIr. pl. *ćatā, generalized to the singular (and dual). This is the view of Cheung (2002: 66), who suggests that "[t]he exceptional preservation of *-æ* in Iron is perhaps due to composition" in the frequent phrase *sædæ sædæ æmæ ærzæ sædæ* 'a hundred hundreds and thousand hundreds' (referring to an enormous quantity). The difference between the treatment of word-final **-ā* in sandhi here and in PIr. *aštā → Oss. *ast* 'eight' is not a problem, since the latter was surely influenced by the neighbouring numerals "five", "seven", and "ten" (Kim 2020: 259); but the retention of *-æ* in Iron would be unexpected.[42] Thordarson (1990: 258) objects that *sædæ* "is not a genuine Iron word", but its frequent attestation in epic suggests that it is not just a recent import from Digor into the modern standard language.

If I *sædæ* is an inherited form, the correspondence D *-æ* ~ I *-æ* points to POss. **-e*, which could continue PIr. **-ai* or **-ayah*.[43] The former has two potential sources: the neuter *a*-stem nom./acc. dual ending of PIr. *ćatai, generalized from *duwai ćatai 'two hundred' to higher multiples and then the singular; or the pronominal nom. pl. ending **-ai*, which as will be argued below underlies the ending of *be(u)ræ/biræ* 'many, much; very' (§3.3). Yet another possibility is raised by the *i*-stem inflection of Khotanese nom./acc. *satä*, loc. *sītuvo'* 'hundred' and nom./acc. *ysāre*, loc. *yseruvo'* 'thousand', which was apparently extended from the decads "sixty" through "ninety" (Emmerick 1992: 290–291). If pre-Ossetic shared in this remodeling, POss. **-e* could be from *i*-stem nom. pl. **-ayah*, with the same development as in *ærtæ* 'three' < POss. *ærte < PIr. masc. *θrayah.[44]

3.2. "Thousand"

"Thousand" is expressed by the Turkic loan *min* alongside *dæs fonʒinsæʒi/dæs fonʒyssæʒy*, lit. 'ten hundreds'. The borrowing of *min* must be relatively recent, since otherwise one would expect I †*myn*. Interestingly, Güldenstädt (1791: 537) gave only *Des sadda* for both dialects, whereas Sjögren (1844a: 102; 1844b: 169) listed D мін (*min*) and I дæс фондзвсæдзуj or мін ("*dæs fonʒysæʒyj* or *min*"), implying that the Turkic numeral was introduced around the turn of the 19th century.

The reflex of PIr. *hajahram 'thousand' (Av. *hazaŋrəm*, Bac. ναζαρο, αζαρο, Khot. *ysāru*, Pth., MP *hazār* [borrowed as Arm. *hazar*]; cf. Ved. *sahásram*) is *ærzæ* (*ærʒæ*),

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which survives only in the Nart epics with the meaning 'countless number, myriad' (Frejman 1934: 562–564; Abaev *Dict.* I: 186–187). The final -*æ* could have the same origin as that of *sædæ* or been secondarily influenced by the latter. The syncope and metathesis are both regular: PIr. **hajahram* → **hazarai* (**hazarā*?) > **azre* (**azra*?) > POss. **ærze* or **ærzæ* (cf. Cheung 2002: 38, 69).

A reflex of the inherited numeral is contained in the Sarmatian proper name *AZAPIΩN* (Tanais 220 AD);[45] while the corresponding Alanic form is the source of CGo. *hazer* 'thousand' and Hu. *ezer* 'id.'. Both borrowings precede the operation of metathesis, and probably of syncope as well. The CGo. form, phonemically /xazər/, could be from **hazare* (**hazara*) or **hazre* (**hazra*), though we might expect a reflex of word-final /-ə/ < *-e* (**-a*); also possible is **hazar*, the expected reflex of PIr. **hajahram*, if this was still in use. The retention of initial **h-* as ‹h›, presumably [x] (Stearns 1978: 82), indicates an earlier date than the period of Alanic-Hungarian contacts, which may be assigned to the 8th c. (Sköld 1924: 88–90).[46] Hu. *ezer* has a prevocalic stem *ezr-*, but this is a later development (cf. older pl. *ezerek* for modern *ezrek*). The Alanic source was therefore something like **azəre* (**azəra*) or **azire* (**azira*) with weakening of the second syllable from **azare* (**azara*), though it cannot be entirely excluded that a syncopated **azre* (**azra*) would have been borrowed as Hu. *ezer* with epenthetic vowel.[47]

3.3. "Ten thousand"

Also going back to an Iranian numeral is D *be(u)ræ* / I *biræ* 'many, much; very' ← PIr. **baiwar/n-* 'ten thousand' (Av. *baēuuarə*, pl. *baēuuąn*, *baēuuani*, Pth., MP *bēwar* 'myriad, ten thousand' [borrowed as Arm. *bewr*], Bac. βηοαρο, βρηοοαρο).[48] The original value survives in Old Georgian *bevr-i* 'many, much; ten thousand', which could have been borrowed from Old Armenian or Alanic (Abaev *Dict.* I: 262); the modern Georgian continuant means only 'many, much'.[49] The extended meaning 'many, innumerable' is attested already in antiquity in the Sarmatian names *ΒΑΙΟΡΑΣΠΟΣ* (Tanais, c. 220), *ΒΑΙΟΡΜΑΙΟΣ* (Olbia), respectively **baiwar-aspah* 'having many horses' and **baiwar-māyah* 'having many arts' (Zgusta 1955: 82–83).

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[45]   See Vasmer (1923: 30 [1971: 129]); Abaev (1949: 168; *Dict.* I: 187); Harmatta (1951: 308; 1970: 94).

[46]   For further discussion of CGo. *sada* and *hazer*, see Kim (2022), where a date in the late 4th century is proposed.

[47]   Cf. Munkácsi (1933: 91 "**äzərä* vagy **äzirä*"); Honti (1993: 200 "**æzəræ* oder **æziræ*"); *EWU* (1993: 346 "wahrsch[einlich] **ezëre* od[er] **ezire*"); Katz (2003: 305 "*ezer* … < **ɛsirɛ* ← alan. **äzərä*"). Joki (1973: 260) leaves open the possibility of syncope: "alan. (altoss.) **az(ä)rä*." The Alanic loanword in turn replaced the earlier Finno-Ugric borrowing from PInIr. **safʰásram* (Joki 1973: 318–319; Rédei 1988: 466–467; Katz 2003: 291–292), just as Hu. *száz*, Finnish *sata* etc. < Proto-Finno-Ugric **śata* 'hundred' is a borrowing from PInIr. **ćatám.* – I am grateful to Bela Brogyanyi and László Honti for helpful discussion of the Finno-Ugric data.

[48]   Cf. Khot. *byūrru* < **baiwarn-am* with conflation of *r-* and *n-*stems as in *gyagarra-* 'liver' < **yakṛna-* ← PIr. **yāk-ṛ* ~ **yak-n-* (Emmerick 1969: 69; 1980: 168).

[49]   The Ossetic form may also have been borrowed into Kabardian as *бэрэ* [bara] 'many times, (for) a long time' (not *beurə* as cited in Troubetskoy 1921: 249), but see Šagirov (1977 I: 70).

As for the ending *-æ* of *be(u)ræ/biræ*, which alternates with *-e-* in D pl. *beretæ*, this can only go back to PIr. pronominal nom. pl. **-ai* (Lubotsky apud Cheung 2002: 65–66). After the innovative plural marker **-tā* (> Oss. *-tæ*) became established in the language, the unsuffixed form could be reinterpreted as the unmarked singular. Hence thematized **baiwar-ai* > POss. **bewre* (syncope; Cheung 2002: 69) > D *be(u)ræ*, pl. *bere-tæ* / I *biræ*.[50]

The presence of pronominal **-ai* here – in an old athematic stem no less! – raises the possibility that *sædæ* and *ærzæ* likewise go back to reinterpreted plurals **sat-ai*, **azar-ai*, with masc. **-ai* replacing neut. pl. **-ā* in PIr. **ćat-ā*, **haĵahr-ā* (§§3.1, 3.2). Even if there is "not a single trace of **-ai* in the (D.) plural or derivative formations" (Cheung 2002: 66), such forms could have been lost in the relatively late prehistory of Ossetic, as *ærzæ* and then *sædæ* passed out of use as the usual designations of "thousand" and "hundred", respectively. As will be discussed elsewhere (Kim forthcoming), this ending could also be the source of the stem vowel *-e-* found in the Digor inflection of numerals and nouns governed by numerals, e.g. gen. *avd-e-j* 'of seven', *avd furt-e-j* 'of seven sons'. However, the word-final **-ai* underlying POss. **sæde*, **ærze* could also be the neuter dual ending (§§3.1, 3.2), which raises an alternative scenario: starting from **duwai* 'two', the ending **-ai* spread to the inflection of the higher numerals, and from there to nouns governed by numerals.

4. Summary

The teens in Ossetic (§1) by and large continue their Proto-Iranian preforms, with minor adjustments such as remodeling of "fourteen" after "four", as in most other Iranian languages, and extension of *-n-* from "eleven" and "fifteen" to "thirteen". Noteworthy is the conservative treatment of both PIr. **aiwan-daća* 'eleven' and **dwā-daća* 'twelve' in *jeuændæs/iuændæs*, *duuadæs/dyuuadæs* (without later alterations such as ModP *yā(n)zdah*, *davā(n)zdah*), otherwise found together to my knowledge only in Parāčī and Ōrmuṛī among Modern Iranian languages.

The nasal of "twenty" arose in Proto-Indo-Iranian and spread to "thirty" (§§2.1, 2.3); its retention in D *insæj*, *ærtin* is thus an archaism within Iranian. An older variant of D *cuppor* 'forty' survives in D *cæppors** / I *cyppurs* 'Christmas' < '(festival) of forty (days)', from a virtual preform **čaθarućat-* (§2.4); as in "thirty", the ending was remodeled to **-ah* > **-Ø*, and the now final **-s* was irregularly lost in the numeral. In the higher decads, the reflex of PIr. **-āti* spread from "seventy" and "eighty" (where it was itself an Iranian innovation) to "fifty" and "sixty", leaving only D *næwæʒæ* 'ninety' as a near-regular outcome of PIr. **nawati-* (§2.5).

Finally, the immediate preforms of *sædæ* 'hundred' and *ærzæ (ærʒæ)* 'countless number, myriad' < **'thousand' are ambiguous (§§3.1–3.2). If only the Digor forms are inherited, they could continue PIr. pl. **ćatā*, **haĵahrā*. If however the Iron forms are not just recent borrowings from Digor, the correspondence D *-æ* ~ I *-æ*

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[50] Extremely unlikely is a connection with PIr. fem. (*ā*-stem) gen. sg. **-āyāh* (Bielmeier 1982: 64).

would point to *ćat-ai*, *hajahr-ai*, which could be generalized from the dual (e.g. *du-wai ćatai* 'two hundred') or remodeled after pl. *baiwar-ai* 'ten thousand', the source of *be(u)ræ/biræ* 'many, much; very' (§3.3); also thinkable is *i*-stem nom. pl. *-ayah*, which would find a parallel in the inflection of the Khotanese numerals.

The findings of sections 2 and 3 may be summarized in the following table.

PIr.			POss.		Oss.
winćati		>	*insædʸ*	>	*insæj/ssæʒ*
θrinćat-	→ *θrinsah*	→	*ærtin(s)*	>	D *ærtin*
čaθwr̥ćat-	→ *čaθarusah*	→	*cæppor(s)*	→	D *cuppor* cf. D *cæppors** [I *cyppurs*]
pančāćat-	→ *pančāti-*	>	*fænʒadʸ*	>	D *fænʒaj*
xšwašti-	→ *xšāti-* (?)	>	*(æ)xsadʸ*	>	D *æxsaj*
haftāti-		>	*ævdadʸ*	>	D *ævdaj*
aštāti-		>	*æstadʸ*	>	D *æstaj*
nawati-		→	*næwædʸæ*	>	D *næwæʒæ* (*næwæʒ, næw*)
ćatam	→ *satai*	>	*sæde*	>	*sædæ*
	[pl. *satā*	>	*sædæ*	>	D *sædæ*]
hajahram	→ *hazahrai*	>	*ærze*	>	*ærzæ* (*ærʒæ*)
	[pl. *hazahrā*	>	*ærzæ*	>	D *ærzæ* (*ærʒæ*)]
baiwar/n-	→ pl. *baiwarai*	>	*bewre*	>	D *be(u)ræ*, pl. *bere-tæ* / I *biræ*

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