

Ārsi-Candrakānta by Sergey Malyshev

CHAPTER I

I.1. Ārsi-Candrakānta generates Tocharian A word forms in isolated usage.

I.2. Candrayantra is an engine built upon it.

I.3. In this chapter are laid out rules to arrange morphemes into words.

I.4. Morphemes are found in the table “Morphemes”.

I.5. Morphemes are roots except the first sixty-nine. Roots are referred to by their shape (here in bold: **ñäkta**), the others by their meaning (here in small caps, but person in bold, e.g. PRS, **3**; v is pronounced “volitive”, LOCAL “locative-allative”, HAB “habitative”). “–” is any morpheme. “~” is a sequence of morphemes of any length none of which belong to the postfix. Morphemes whose gender is M and F are called “masculine” and “feminine”.

I.6. A morpheme’s shape consists of **letters**: consonants, vowels and `.

I.7. Consonants (C) are: *ś, ṣ, s* (sibilants), *k, g, c, j, ṭ, ṭ, d, t, d, p, b, z, q* (stops; the first ten have corresponding aspirated stops, written as “stop + h”), *h, hkh* (up to here obstruents), *l, r, λ* (liquids), *y, w, v* (glides), *ñ, m, ṇ, ṇ, n* (nasals). Vowels (V) are: *ä, ă* (short), *a, ā, i, ī, u, ū, e, o, r, ai, au* (long).

I.8. A morpheme is long if its current shape has a long vowel, otherwise short.

I.9. Morphemes can be called by their groups or category (“Ip̄f”, “name”). “Adjective” refers collectively to relative, qualitative and numeral, “noun” to weak, middle, strong, creature, double, name.

I.10. Words consist of a stem and an ending, both continuous sequences of morphemes. They are built by appending morphemes using the following algorithm.

I.11. For the first morpheme, which goes to the stem, you can choose any morpheme except the ones from ABL2 to Q.

I.12. Switch the sequence from stem to ending: before PL not after weak, person, person~gender, numeral (except **ṣomă**) and DU after doubles; before gender after adjective; before person after tense; before non-initial case and voice.

I.13. Below are your choices of what morpheme to append at any given step.

After person: in ending add number; in stem after **3** add deixis, gender + number + deixis, DU + deixis or SG/PL + OBL, after **Pānzam** PER, LOC or gender+MED, after **1** gender, SG+OBL or PL, after **2** number or number+OBL. After causativity add PPA, PPP, GER1, GER2,

INF, PPM or tense. After tense add person. After gender add number (after **lānt**/**swāpant** + F also NMZ), but case after **vā**, **tārāy**. After number: after tense~ add voice, otherwise case (after **2**+SG and **kanwe**/**pāśśā**/**pkloz**+DU also ADJ; after Ag+DU also BAH1). After verb add causativity. After indeclinable, numberless, deixis and initial case add case except Prattika, after **qā** also PL, after PL+deixis also ADJ. After numeral add TEN (not after **šomă**) and PLUS (these two not after **śāka**, TEN, PLUS), ORD; gender after **šomă**, **vā**, **tārāy**, after others case (after **šāpta** also PL). After relative add gender, after PPP, **mkältāwr**, **ālāk**, **p** also case, after **p** also DU, after **vā**+ORD PER, after **pāqālā**+ADJ ACC, ABL; after **knās** + V + PPM (+ NMZ + BAH1) also NMZ. After qualitative add gender or NMZ. After nouns add number, ADJ, after weak also PL+ADJ.

I.14. Additionally, you may add, not after verb/causativity, NOM after **Šomă** (and - *a`*), F after **Lānt**, POS after **Asurā**, ADJ after **Ksār**, BAH1 after **Kñuk**, BAH2 after **Pälzāk**, HAB after **Ri**, NMZ after **Riṣak**. If **ñākta** is preceded by a root, it loses compatibility with F and NMZ.

I.15. You’ve built a word as soon as you’ve chosen non-initial case or voice; you may exit early if the current morpheme is Prattika or Ywār (such words are called “construct forms” and are used in compounds, whose formation is outside of the scope of the Candrakānta).

I.16. The first morpheme of your sequence (or the first two if the first one is verb) form a **lexeme**; its name is formed by a capital letter depending on the last morpheme of the lexeme (“V” for v, “K” for k, “A” for name, “X” for numberless, otherwise capitalize the first letter of the category)¹ + an underscore + the first morpheme’s name; its meaning coincides with the first morpheme’s meaning (plus “(K)” if K is present), e.g. **riṣak**, **lāg**+K yield lexemes **Ṡriṣak** “sage”, **ᵏlāg** “see (K)”.

I.17. You may also take lexemes from the table “Lexemes”, where lexemes are listed together with their morphemes (all in stem) and characteristics (which are inherited by their last morpheme except the category “verb”; the categories are expressed by capital prefixes as explained above; “v” and “k” give the category “verb”). Complete these sequences into words by the same rules stated above.

¹ Here they are written as superscript without an underscore.

I.18. Each time you append a morpheme (except gender after **3** and number, deixis) to a lexeme's stem, you create a new **sublexeme**. The Candrayantra creates a page for each sublexeme.

I.19. Limitations. Person: after IMP only **2** impossible. Case: ADV is only possible after **3**+deixis, OBL only in the declared cases, LOCAL only after Saṅkrām+SG, ABL2 only after Şurmă(+SG), ABL3 only after Anăpr(+SG), **3**+DIST, **vtām**+V+PPP and **kālme**+PL; after **korp** only ALL and PER are possible, after **pos** also LOC, after **el** PER and LOC, after PPP only ABL and PER (after **tām**+V also ABL3, after **tärk/kärs**+V also NOM and ACC, after **läm**, **näzv**, **lāw** also INS), after **mkältāwr** only ABL3, otherwise after indeclinable and initial case only NOM is possible (not after Ac), after **antu**, **lutār**, **ś`āw** also ABL, after **şolār** LOC, after **menāk** INS, after **snepal** and **neş** PER, after **ywār** PER and LOC. After **qä**+PL only NOM and ACC are possible; after **xālamwäc** NOM is impossible. Causativity: only the ones listed in the “causativity” property are possible. After verb+V PRT is impossible after **qäm**, Ipf after Klänk. Number: DU is only possible after **3**~ in stem, **p**~ , **pracār** and double; PL is impossible after names (except **upendre**, **śākyamuni**).

I.20. You may add a postfix to your word (except construct forms): either EMPH+NOM or (only after voice) **1/2/3**+SG/PL+OBL.

I.21. Now follow rules that change the letters of a word's morphemes.

I.22. A morpheme's last letter is called, unless it is the word's first vowel, **bhu** if it is an *a*, *ä*, *ǎ* or *ā* to the left of the ending's case/voice and the next letter belongs to EMPH, PLUS, case or doesn't exist; **bha** if the next letter either doesn't exist, belongs to EMPH or is a *ş*, *y*, *n*, *p*, *t* of PLUS, ADJ, PL, case or postfix; **bhi** if the next morpheme is ADJ, ANIM, QUAL or doesn't exist; **bhe** and **bho** if the next letter belongs to EMPH, doesn't exist or (in case of bho) is a consonant or word-final `.

I.23. “Palatalize X” means “add - ` to X”. “Gemination” is repetition of consonant, “degemination” is deletion of consonant after equal consonant.

I.24. Morphemes are native if their “language” characteristic is empty, otherwise “foreign”. Nativization is changing non-native letters to native according to the table (the reverse process is denativization):

Non-native	kh, g, gh	ch, j, jh	ṭ, ṭh, ḍh, th, dh	ṇ	v	hkh	ī	ū	ṛ	ai	au
Native	k	c	t	n	w	h	i	u	ri	ay	aw

I.25. “X-ablaut”, or “X^o” for short, is change of verb’s last vowel (if it’s *ä* or *ā*) to X.

I.26. When color/voice is assigned, the old one is gone; when PrsEnd is assigned, PrtEnd is gone and vice versa.

I.27. “In verse” means “optionally in verse, marginally in prose”.

I.28. Vowels split words into consonant clusters. A cluster is **permissible** if, after final degemination, (1) it is *šln*, *ynty*, *rmnt* or *mncs*, or (2) it doesn’t have *r*, *l*, *y* in the middle and is at most three consonants long.

I.29. “A morpheme drops” means “all its letters drop, i.e. turned to zero”.

I.30. A rule is applied from left to right if its number is underlined, otherwise from right to left.

CHAPTER II

II.1. PL moves to stem after **šäpna** before NOM, ACC, to ending optionally after Indri not before ADJ/ABL₃.

II.2. Before v. Vāl before Prs and Tränk before Opt except weak GER₂ are green. Mlänk are black not before Imp, Opt, IPF, PRIV. Täs are yellow before Ip_f. **yom**, **šäy** before Imp and **täs** before Prt are red. **enz**, **twäs** and red verbs are gray before Ip_f. **läť** before Prt and **vān** not before Ip_f, IMP are green. **āy** before Prt and **y** before IMP are black. **pās** before Prs and Wāl before Ip_f are gray. Violet verbs except Wāl, **māsk**, **met** are blue not before Ip_f. Before IPF Zäyp are red, Pär are azure. **yām**, **šāw** before Ip_f and **tāmp** before Prs are pink. Optionally: **kälāw** before Ip_f is gray, **krop** before Prs is black, **vāyn** in verse and **tākw** are blue. Zärt and pink **kälāw** before Ip_f, **läg** not before Ip_f and violet verbs before PrsEnd change their voice to M.

II.3. Before k verbs are gray, but short verbs are yellow before Opt. **läyp** before Imp, **wätk**, **pāl** (and optionally short verbs in *-k*, *-q*) before Prt and **nāk** not before Ip_f are red. Träyk are pink before GER₂+NMZ. **lām** is yellow before IMP. Verbs are blue before PRIV. Yāt and optionally Šärp before Opt are green, as is **spārtv** before Prs.

II.4. These forms cannot be built: **arkānt**+M+SG+NOM; X+v~MID/ACT if M/A isn’t in X’s voice; X+K~MID/ACT if v isn’t in X’s causativity and M/A isn’t in X’s voice; if PL or DU in ending is followed by ADJ.

II.5. näytk → *nätk* before ~INAN1. **läq** → *läwk* before ~Imp/Opt (before ~PPP optionally). Optionally **bäk** → *bäq* before V+GER2.

II.6. Before V. **āy** → *vä* before Imp, *a* before IMP. Before IpF *wās*, **qāk**, **läm**, **vāw**, **yām**, **vān**, **štām** → *äw*, *ken*, *šām*, *āk*, *yp*, *tränk*, *käl*. Before Opt/PPP/PRT **y** → *kälk*. Before Imp, Opt **šäw**, **pär**, **yok**, **knās** → *tāp*, *kām*, *zäwk*, *knā* (pink *kñāññ* not before PRIV). **tāk** → *tā* before CON (optionally before **3**+PL), *štāk* before IMP, *nāz* before PPP, *nas* before PRS (*na* before **3**+PL), INAN4, GER2, *š* before IPF. **tās** → *tāw* before Opt/IpF, *t* before PPP.

II.7. sasāk → *snākā* before F. **šomă** → *sas* and *sän* before M and F + SG+NOM, *ša* before PLUS, *malto* before ORD and NOM. **vă** → *văštă* when final and before NOM, *ve* before PLUS, *vun* before M, *ven* before F. **täräy** → *täräyā`* before PLUS, *täreŷ* before M, *taräy* before TEN. Before ORD **štwarā**, **păñ** → *štär*, *p*. Before TEN **šāk**, **ñāw** → *säk*, *nma*.

II.8. ālāk → *ālam* before **vă**. To **p** add *ām-* before ~DU and *-äq* before ~case or ~SG+NOM, otherwise *-ont* before gender. Add *-c* to **qä** not before GEN (but *-s* before NOM) and to **ywār** not before NOM, to which before any other morpheme add *-k*, which is added to **tāpär** preferably, to **ksär** before ADJ (marginally before NOM) and **kāze** before INDECL. Add *-āw* to **neş** before NMZ (marginally before NOM). Add *-ñ* to **umpar** before gender not before SG+NOM. Before PL add *-`äy* to **olăr**, **ratg**, *-e`* to **pracăr**, ANIM2.

II.9. -căr → *tär* before DU, *cär* before BAH2, PL and marginally SG. *ă* → *a* optionally in **ănăndă**, **anăpr**, preferably in **mărkampăl**. In **şula** *u* → *ă* before INDECL. Optionally *ur* → *ru* in **şurmă**, **purccamāw**. F → *ñā`* after **Zen**, which lose their *-e*. Optionally, last letter in *Śākki* → *e*, in *Kumbhāṇḍe* *ā*, in *Kinnare* *i* before PL, in *Vidyādhare* not before F drops. Before number in nouns *-a`* drops. In verse **wmār**, **penu**, **namo**, *mahā* → *wumār*, *pe*, *nmo*, *mhā*. In **śrāddhe** optionally *-e* → *ă* before NMZ. **päsra** → *pärsă* before INAN4, optionally elsewhere. *äl* → *al* before QUAL in **eñkäl** and marginally **wärkşäl**.

II.10. Optionally **yāwka**, **päsqa**, **eşe**, **şreşthi**, **şlokă**, **şolākā** → *yäqa*, *pässākā*, *işe*, *şrişthi*, *şlokă*, *şolākā*. Preferably **asaṃkhye** → *asaṃkhe*. Before ADJ optionally **şoşäy** → *şoş*. **ag** → *eş* before PREF.

II.11. kāsāwă → *krant* before gender not before SG+NOM, *kränt* before F+SG, optionally *kāsāwe* before M. **kāv`älte**, **mokă**, **nätg** → *kränzäy*, *māke*, *nāsy* before F. **zopăz** → *šāv`ă* before gender+PL. Before SG+NOM/ACC **kow** → *ki*. Before (M+)SG+NOM **lev`ă**, **qlewā**, **koṇ**, **lānt** → *li*, *qli*, *ku*, *v`äl*. **lānt**, **śri**, **buddhā`** → *v`älā*, *śri*, *pättā*

(optionally plus *ñ*) before **ñäkta**. When final, add -*ă* and -s to **kon** and **kunti**. Before roots, **mā** → *a*, but *ā* before **śrāddhe**.

II.12. PREF → *an*, *ā*, *ñy* after **länk~**, **bärk~/kon**, **wşe**. INDECL → *men* after **şpāl**, *ārc* after DU, *ālā`* and *ār* after **yäw** and **läytk** + V. PPP drops before POS, → *we* when weak after **yät~**; it loses its *r* before gender, NMZ, DU, PL, when strong or before K+ (SG+) NOM/ACC. GER lose *ă* before NMZ, ADJ and PL (not in **wrkäl**, **wel**, **wśwāl**).

II.13. ORD → *wināw* after **şomă**, *d* after **vă**, **tărăy**, **ştwară**, *ăşd* after **şäk**; its *d* is palatalized after **ălăk~** or before gender except M+SG+NOM; add -*an* to it after **vă** before (M+SG+)INS/LOC, otherwise optionally (a) after **ălăk~** or (b) after **vă** before M+SG not before NOM/GEN. After **vă**, **şäk**, *a* TEN → *iki*, *säk*, *uk*. Add -*i* to TEN before ORD.

II.14. ADJ → *ăy* after **Ñäkta**, which lose their -*kā*, -*a*, -*ā*, and optionally after LOC; *nt ăy* after **şme**, **qlewă**, **atră**, which change *wă*, *ă* to Ø, *o*.

II.15. After causativity INAN1 → *i*, *ăy*, *ă*, *ke*, *me*, *m*, *mă*, *ă*, *ăowă*, *`e* after **pärsk**, **wärp/yär**, **kälăw/lăg**, **v`ras**, **y**, **şăwr/săry**, Plāk, Kăln, Krăs, Păs; INAN3 → *tăr*, *măsăw*, *z* after **y**, **sey**, **kälăw**; INAN4 → *oññe*, *mă*, Ø, *ā*, *ntă*, *āră*, *ānză*, *şină*, *onă*, *enă* after **ştăm**, **tăk**, **krop**, **kăry**, **wărk**, **păyk**, **pălk**, **kărk**, **băl**, Vărs; ANIM1 → *om* after **vărs** (*ă* before PL, ~GEN), *ā* after **lăg** (which becomes azure) and **zăyg**; ANIM2 → *ñe* after **kăp**; QUAL1 → *ăşănăw* after **lăq** (*ăşă* before NMZ), QUAL2 → *arşke*, *ez*, *ălz*, *ără* after **pot**, **pălk**, **wătk**, Tăp; QUAL3 → *ră* after **ăs**; REL1 → *azum* after **kăry**, REL2 → *matăw*, *`e*, *ăy* after **y**, **păs/kăn**, **măsk**; REL3 → *ăam*, *tă* after **tămp/kăwłp**, **săl**.

II.16. Not after causativity INAN1, INAN4, ANIM1, QUAL1, QUAL2, QUAL3, REL1, REL2, REL3 → *`i* (before it *ăw* drops), *ari*, *ikă*, *assăw* (before it *ime* → *yme*), *z*, *wăz*, *om* (not after **şăpna**), *ăw*, *ănăw*.

II.17. INAN4 → *ññe*, *nă*, *ină* after **wşe**, **poke**, **prăr**; ANIM1 → *tă*, *ită*, *aşşe*, *ăw*, *enăw* after **kuryar**, **lokă**, **şăñăy**, **wacă**, **săntăkă/yokmă**; QUAL1 → *ăw*, *essăw*, *săw* after **parn**, **ăk**, **kip/enkăl**; QUAL3 → *ăz* after **wklyu**; REL1 → *ăy*, *ikă* after **kaşt**, **krităn**; REL2 → *ăy* after **wăsă** (which loses -*ă*). In QUAL2 *ss* → *s* after Klop~.

II.18. QUAL2 *z* → *ză* after *mă* INAN1 before F+PL. ANIM1 drops before NMZ; its -*ă* drops before F. Optionally add -*ăw* to REL3 in -*m* before M+SG+NOM. Add *ăt-* to ANIM1 after **săqă**. To NMZ, BAH1, REL3, QUAL3 add *z-* after Omălă, *az-* after Ekără and optionally **ăk**. BAH2 drops after long vowels. NMZ → *ñe* after **purccamăw** (which loses -*ăw*), *rñe*

after *w*, *re* after **Qparno**, *ne* after **pās**+V+PPP, *isparn* after **ārāntā**, **buddha`**. In verse *ă* → *ä* in *ăśănăw*. BAH1+NMZ and optionally BAH2+NMZ drop. NMZ optionally drops after Kāsăwă (before PL only after **kārme**) and between **ortā** and BAH1. *m* + BAH2 → \emptyset + *m*.

CHAPTER III

III.1. IMP → *ă* before ~PL+ACT, drops after **y/āy**+V. After black verbs IMP is PrsEnd before ~PL, PrtEnd before ~SG. IPF → *e* and PrsEnd after **y/tāk**+V.

III.2. **1** and **2** → *wa* and *ya* in stem before DU/PL. **1** → *n* before ~SG not in endings, *wā* after PrtEnd before SG. **2** → *s* before PL+ACT not after PrsEnd, drops after IMP before SG. **3** → *s* before ~SG~NOM, *ŋt* before PL, *r* before PL+ACT after PrtEnd, drops before SG+ACT. Person X drops before Y+OBL, if X = **3** or Y = PL (but becomes *nă* in stem).

III.3. OPT → *śśi* after **pāk/yāk** + V. Not before **3**+SG+ACT drop: PRT, IPF after red (before ~ACT) and violet verbs; PRT after **lāt/āy**+V before **3**+PL+ACT and optionally after **yām**+V before **1/2**+SG+MID.

III.4. DIST → *ām* before ABL3. MED → *ăn* after PL. MID → *r* after PrsEnd~; after **1/2**+SG *ār* (*āy* after PrtEnd).

III.5. Not before ~SG+NOM: add *-āw* to *ăk* before F+PL; *-ant* to **ārkāy** before gender (except F+SG); *-n* to *kränzäy*; *-n* to *-äy* (not Täräy), *-we*, *-te* before gender (marginally before ~SG+NOM), but before F optionally and not after **ñākta**; *-in* to *-m* before F and preferably to TEN/PLUS+ORD before M; *-lā* to **mokă** before M+PL; to *-mān*, *-m*, *-w* (not in **śom**) if they are strong or followed by gender/DU: *-ăs`* before (M+)PL+NOM, *-ānt* otherwise; *-s* to *-w*, *-nt* before F (even before SG+NOM) not before PL and to *-nt* of **lānt**, ANIM1, PPM before F+PL.

III.6. M → *e`* before PL not after *n*, *nt*, *y*, *s`* and long vowels, → *ă* after **3** before SG not before ~NOM. M and F → *ăşa* and *ăqa* after **1** not before PL, ~GEN/OBL. F → *o`* and *e* after **3** before PL and SG+GEN; *eññā`* after **ñākta**; *ă* optionally between **lānt** and PL; *ā`* after *e*; *y* after *ś*, *z*, GER before SG+NOM; *ñcā* after *ā* not in adjectives (optionally after **măskitā**); *olāñcā* after **kārta**; *ikā* marginally after PPA.

III.7. SG → *ăn* in ending not before NOM/GEN: after gender/name/strong (not native *t*, **şomă**, ORD+M after **vă** and optionally **ştwarā**+ORD+M), **p**+M, **măskitā** before

ACC, optionally **lānt**+F and *t* in **kāsāwă**+M; after **2** not before GEN/OBL → `äwa, but äw before NOM.

III.8. DU after **p** not before gender drops, after doubles `än (but än, äñc after ă, ā`s), äntwen after weak, *n* after creature/strong (*i* before NOM, ACC not after vowels or *y*) and **1**, **2**, *i* before deixis, *es* before ACT, *i* and *e* after **p** + M and F before NOM/ACC.

III.9. PL → *t* between **1** and MID, drops between **2,3** and ACT and optionally after black~IMP~; in stem after nouns/numerals: äntäw (ntäw after -*i* and -*o*); before NOM, ACC, INS: ntäw optionally after -*a* and **waştă**, **arthă**, but (not in Săqă and **Wzpok** before INS) *nt* after -*a*, -*ă* (optionally before INS after -*ră*, -*lă*); `iy, *is*, än, ` , wā ` , äwā after **wal**, **kor**, Wram, -*ā*, **bält/bältäk** , Prār (and optionally **Wcmol**, always before NOM, ACC, ADJ); `äy in ending before NOM not after F; *e* after **qä**; ñ in ending before NOM after V(`)/*y*; Ø after *nt*+F, OBL, non-weak native *e* ` , *o* ` , *s* ` , *t* before ~NOM; before NOM, ACC: *yu* optionally after **pe** and marginally after weak “*p*, *m*, *w* + *e*”, äw marginally after **āñkăr**.

III.10. Add -*n* to ă, *a* of qualitatives/**şomă** before F+PL (then PL drops), ş- to SG+ACT: after PrtEnd to **2**, after PrsEnd to **3**.

III.11. NOM → `yās after **bāt**, **śāl**; OBL → äm after PL, `äy after **1,2**~SG.

III.12. GEN → śśäy after PL (optionally if PL is in stem), än after **1,2** + PL, *i* after 3~ not after F+PL~, *e* after **qä** and DU not after doubles or **p** (optionally after weak+DU), *u* after **ālāk** (which loses -*ăk*).

III.13. “After X” here means “after X(+SG)”: GEN → *y* after ā(`), *u*, *ū* (not middle, weak, double, **kayurşā**, **qlewā**), āp after masculine gender, strong, name (not -*ā* ` , *u*, *ū*, Ñäktā), ñi after **1,2**~ (`i after 1+M~), *i* after Păcăr and non-feminine names (except **metrāk**) in consonant, *es* after **āñcämă** and ă, *a* of name, strong and creature (not **oñkā**), **Wyärk**, **Wpälzäk**, **lävā**, optionally **käntwā**, *e* preferably after **Cpättāñkät** and marginally **kapsăñyā/oppălā**, *s* after name or creature in -*e*, -*i*, -*ī* or strong in -*e* (not ANIM1); Ø, *u*, *o* after **lānt**, **śänā**, **sewā**.

III.14. INS → *o* after *yā*+SG, äkyo optionally between DIST and EMPH. LOC → *ane* in stem and after **3** (optionally *anne*, but before ABL3/ADJ add -ñc instead). COM → śāl optionally after än after *i*, *ī*, *e*, *ā*, ā(`) of strong/name. ABL2, ABL3 → *le*, *aśśi* after indeclinable (not **anăpr**), *iñcā*, *i* after **särka** (*i* also after **ac**), ABL3 → *aşi* after **şurmă**. Add *an-* to word-initial ABL, ALL.

III.15. EMPH → *ak* after **nun/qä**+NOM, *koṭā* optionally after **vä**+ORD+PER.

CHAPTER IV

IV.1. In PL ` → *k* before vowel.

IV.2. -*āk* before gender changes *ǎ* to gender's shape (in case of M, only before PL, optionally before ACC), but in case of **ālāk**+F only before SG+NOM. Then M (and optionally F before SG+NOM) drops.

IV.3. In **läyt** optionally *ā*-ablaut; in **spārtv** marginally *ǎ*° before K+PRT. In **štām**, **skāy**, **pālk** and **bäl/säl/pälzk** `ǎ°, *e*°, *o*° and *a*° before ~INAN4/REL3. In **rāt** *o*° before ~INAN1. *a*° in **rāp**, **wārp** before ~INAN or (not in Bäl, Pās, **lāg**, **pāwtk** and verbs with “ä + liquid + stop”) before V/K + *z* or vowel other than *ä* (not of IpF/Prt). In **kälāw** `ǎ° before V, but `ǎ° before INAN1. `ǎ° in green and red verbs before ~IpF. Before V+IpF: in **zālp**, **zām** `ǎ°, in violet verbs *ā* → *a*, in Mläwsk *a*°, in **zārt** `e°. In Bäl *ā*° before V not before IpF/*ārā*.

IV.4. Add -*n* to **āw**, **lät** before V+PPP, to **säy** before ~IpF/PRIV and optionally before ~Imp. Before V: add -` to **šāw** before PRT, -*s* to **kälāw** before Imp/IpF/Opt, to **āy** before PRT (optionally before **3**+PL+ACT), -*än* to Yäk before Opt, to Päk, Wäl (not in -*n*) and gray **kälāw** before IpF. Add -*ās* to yellow verbs. Before V (with **tām** also K) + IpF add -*n* to gray and blue Rāy and replace the last letter of blue Kät with *n*. In verbs *kn* → *änk* after obstruents, *ln* → *ll* in Rāy, in **pās** *śn* → *n* (but *nś* before V+IPF). Add -*n* to green verbs (not in -*n*) before ~Opt except **trāyk/zārkk**+K+GER2+NMZ. *tn* → *nt* in **lät**.

IV.5. Pink verbs not in -*y*, -*ñ*, -*s* are blue before V+Imp/Opt (**kary** before V+Imp/CON). Before ~PPP violet and long blue verbs are red.

IV.6. Causativity not before INAN/QUAL1/REL1 → *āsā* after red/violet verbs before *ā* except IMP~ACT, `ǎ after green verbs, ǎ after blue verbs before IPF and after pink/yellow verbs, *āsā* after gray verbs, *iññā* after **nāw** before IpF, *äññā* (before which *s* → *s`*) not after verbs (*šäññā* after **säqǎ**, **wañi**), after **yäks** before IpF, after **āks** (optionally before OPT), **oks** (optionally before PPP), **väy** not before IpF; V → *isā* after **āks**, **oks** before IpF, *ā* after **šāw** before PPM.

IV.7. *āsā* drops before Imp after short verbs except Läg, before QUAL2 after **rāt**.

IV.8. Empty causativity (not before `ä, mă or vowel) → ā after blue verbs, `a after violet **spārtv** not before IPF, *a* after violet verbs not before PRT/IPF except after **nāk** before OPT (but *v* → *o* after **tām** before weak GER2), otherwise ä.

IV.9. PRIV → zā after ā, but *z* before M+SG.

IV.10. In short verbs: `ā-ablaut in azure, `a° in red before ~PRT~ACT, a° in violet before ~PRT~MID, in blue/red (except **pälzk**) before *v* (before *k* in Wäl) before IMP~ACT (optionally PL), in red before K+CON, in blue verbs before V~ACT before CON+SG and PRT+PL; `ä° in blue verbs (without “ä + *l, y, k* + consonant”) before V+PRT~SG+ACT.

IV.11. In verbs remove ` after *s(C)*-.

IV.12. *a* + *r/l* switch places between *C(`)* and *s/ş/z* and in **pärk, käln**.

IV.13. In red verbs before *k*: *l* is palatalized before Imp (also in Pälğ before *k* + Imp, INAN3, in **pälzk**+V+INAN4), *tk* before PRT.

IV.14. Initial palatalization: in **tämp** not before ~INAN1, in **tärk** before it; in **läq, läwtk** before ~Imp/Opt; before *v* in **tām, qām** before Opt, in **tāk** before IpF, in **zär** before GER1; before *k* in Kärš (optionally in **läwt** before Opt and **spärk**); before *k* (not äsä) + Imp in *z-*, **štām** and gray **läm**, otherwise optionally in *t-, l-, n-*.

IV.15. Add *pä-* to verb before ~IMP, to **läg** also before *v* not before IpF, ANIM1.

IV.16. Before ~PREF add *o-* to **bärk**, *y-* to **länk, kon, ag, salu**, otherwise before PREF, ~PRIV add *a-* to the root. To verbs not starting with a vowel or “*y, w* + long vowel + nasal”, before ~PPP (unless blue) or K+PRT (unless red or long) add “the verb’s form up to the first vowel with only the first consonant remaining + *a*”-; call the verb “reduplicated”. Add *-n* before vowels after those prefixes and change their *a* to ā if the next vowel is long.

CHAPTER V

V.1. Before nasal, ä of causativity → ä: before CON not after *k*, before PRS after **qāk, tāk**. Optionally ä *k* + *w* PPP drop before PL.

V.2. To morpheme-initial ā- in ending (not MID) add *y-*: after *k, g, d`*, *wāz*, after ä except *mă* (and GER before F) and after *kā* (not to F). Add *-yā* to *e, i, o* before vowel of case or *um, äw, änt*.

V.3. ä, *a* (not strong, **ñäwa, ñäkta**) drop before *un* (which → *on*), *än, äw, y, e*.

V.4. Long vowel (+ *n*) drops before *u* of NMZ.

V.5. Not in postfix, ä, ä drop after vowel (+ `) not before *nt*.

V.6. *e, ă* → ` between *l* and *F ā*.

V.7. Long vowel drops before long vowel (and all ` between them), but *ua* → *u*.

V.8. Are palatalized not in weak/middle/numeral: *t, l* before PL (not 3 before ~MID), before M+PL (also *-g* and *t, l* in **ālāk, mättāk**), before M+SG *t* (unless *bhe*) in Šātă not before *ā* or NOM (in **ālāk** optionally), *l* (and *t, l* in **ālāk, mättāk**) before F+SG.

V.9. Marginally PL *äs* → *es* while both after *nt`* and a masculine morpheme.

V.10. Preferably *nt* → *nś* before *bhe`*.

V.11. ` drops after *k, ċ*.

V.12. *Bhi* → *a* in Šănā and optionally Sewā. *Bhi ā, a* drop after “non-first vowel (not *ä*) + consonant (+ `)”. *Bhi* drops in Neş and optionally Kalpă. Add *-a* to *bhi* of Kşur. *ā* in EMPH drops optionally.

V.13. *w* → *y* after *e/y* not before *ā, äs*.

CHAPTER VI

VI.1. Not after “*ā/a/e/o* + any number of Cs and *ä*’s” optionally *ă* → *a* before PPM.

VI.2. *ă* in causativity → `*ă* before PPA/QUAL2 (but *ä* after `); not before nasals `*ä*, but *ä* after glide before consonant and between **tāk** and V+GER, ` before obstruents.

VI.3. *yä* not before *w* → *e* with **kary** (optionally *yă*), drops with **sāry** before *m*.

VI.4. *ä* → *i* and *a/ă/ā* → *e* before PL *nt`*, which drops before ~1+SG and marginally elsewhere.

VI.5. Before PPP *āwä* → *o*.

VI.6. *ä/ă* drop (not in INAN4 or before *y, w, r, t, k, sk, şäy*) after “V + glide (*v* only native; not in **skāy** before *äs*)” and “V + *w*”; *ä* in verbs drops after “vowel + *w*”.

VI.7. *ā, a, ă, e* + bho *y* → *e* not before `.

VI.8. *wā* drops after *ā* if *w* belongs to verb.

VI.9. All non-first *a/ā* → *ä* in a reduplicated verb. If the first vowel is long and the second vowel is *a/ā* in **bāt**, tense, causativity or verb (not pink), the latter → *ă* (but after **enz** only optionally and only in V not before *l*).

VI.10. *ayä, avä* → *e, o* before *t*.

VI.11. Before consonant *äv`, yp`* → *Ø, ya* (also before *äl*).

VI.12. *ăw* and optionally *āw* drop if *w* belongs to **1**.

VI.13. *w* → *u* between obstruent and consonant.

VI.14. *ǎ* → *u* after “*ǎ* + liquid” before *nt* of PL.

VI.15. Stops are geminated before word-final *r* marginally.

VI.16. *Bhu* drops not in verbs (in *Yārśārā* optionally), in **1** only after red/violet verbs~ (optionally after PRT) not before EMPH, in PRT/IPF after green verbs~ and not after *ǎ/äy* (PRT optionally after **käläw**+*v*).

VI.17. *ǎ* drops before roots.

VI.18. Optionally *F ā* drops between **ñākta**+ADJ and SG+ACC.

VI.19. *v äsä* → *äzä* after **yām** and optionally **āl**.

VI.20. After consonant except *y*: *ṣ* → *āṣ* in ADJ after ~PL/DU/LOC not after **ysār**, **kanwe**; *ś* → *ās* in GEN after ~PL not after *s*.

VI.21. Not in the first syllable *ǎ* → *ä* if the next vowel is not *ä*, except **mättāk** before *yāp*. *ǎ* → *ä* before PPA (not after **v`les**+*v*) before vowel other than *ä* after **pās**~ or unless the previous vowel is *ä, i* (but the one before it is not *a*).

VI.22. *ǎ* → *a*.

VI.23. At word-end *ñy* → *n* in verse.

VI.24. *ts* → *z*, *täsäs* → *zz* before vowel.

VI.25. Bho *y, w/v* → *i, u* after *ä* or consonant, but *ä* in **läyp** before K+PPP+gender, *o* in **kāv`älte**. *ā, a, o* + bho *w* → *o*. *äy* → *iy* before vowel of F or case: in INF, after **ñākta**, *w`* and optionally **päqälā**

VI.26. Nativize native morphemes (and preferably **buddha`** before NMZ).

CHAPTER VII

VII.1. *ǎ* drops before “` + vowel”.

VII.2. Bha *y* (after *e, i*) and *w* drop in **Mske** and not in verb.

VII.3. *C* → *C`* before *p, w, r* + ` in native morphemes; *tk`* → *t`k*; *ṣ`t* → *ṣt`*. Before ` in native morphemes (except *Atäl*) and *Brāhmāṇā*: *k/q/z/ṣ* → *ś, l* → *λ, n/ṇ/ṇ* → *ñ, t* → *c, s* → *ṣ*. Delete `.

VII.4. *ṣ* → *ś* before *ś, c*.

VII.5. Add *ä-* to bha *C₂* after *C₁*: (1) to *c* of 2 not after *ṣ*; (2) to *-s* not after *r, s*; (3) if both are obstruents except “sibilant + *p/t/ṭ*” and optionally *kṣ* after *V*; (4) if they are

$m/\tilde{n}/\lambda + t/\varsigma$; (5) C_2 is n or liquid and C_1 is different (in NMZ preferably); (6) to $-m$ not after m, r, \tilde{n} ; (7) to ς after ς of **käläw**.

VII.6. $\varsigma \rightarrow s$ in PROX if there is s in the word.

VII.7. $\tilde{a}n$ drops after POS.

VII.8. \tilde{a} drops unless what's after it after deletion of all ` starts with “consonant not before vowel”.

VII.9. $\tilde{a}n$ and $\bar{a}n$ drop after n, η (which then becomes n) which does not belong to qualitative root and is not in the second syllable, but only optionally: (1) not after $-in$, (2) in case of $\bar{a}n$ (and then only after in ADJ) and (3) if n is bha only in verse. Optionally n, η drops before n of SG.

VII.10. Bha $h, j, v \rightarrow k, c, p$.

VII.11. $v \rightarrow w$ after vowel before another morpheme's vowel.

VII.12. y not in case in native morphemes takes the shape of the previous letter: c (optionally after **bāt, lokecyē**), y optionally after \acute{s} of **Ñākta**, preferably ς .

VII.13. Optionally $itk \rightarrow \tilde{a}tk$ in verbs except **yātk**.

VII.14. In **vān** $w\bar{a} \rightarrow we, pw \rightarrow p$.

VII.15. $zk \rightarrow sk$ after vowel in **pälzk**.

VII.16. In **lāt** $lal\tilde{a}nt \rightarrow lalnt \rightarrow$ preferably $lant$ or at least $lalt$. Optionally in PL $\tilde{a}nt \rightarrow nt$ between “long vowel + l, r, y, w (not $\bar{a}w$) preceded by at least one syllable” and “vowel or w ”.

VII.17. Not in verb, bha w drops, as optionally does y after e/i before PL.

VII.18. Bhe nasal drops in **vān, vā**, DU after ve, vu, we, wu not after n .

VII.19. Sibilant + z of INF $\rightarrow ss$.

VII.20. Add $-ä$ after consonant before “ r, l before consonant” (except rrC), after k before $l\tilde{n}l$ optionally. Marginally $wašt \rightarrow wašt\tilde{a}$ before **läm**.

VII.21. $l\tilde{n}l \rightarrow \lambda\lambda$. \tilde{n} drops between CC and C and changes to $\tilde{a}\tilde{n}$ between “V + C_1 except \tilde{n} ” and C_2 (except if C_1 is stop and C_2 is l or m).

VII.22. $y \rightarrow i$ after consonant not before vowel.

CHAPTER VIII

VIII.1. *ä* drops not before “consonant not before vowel”, preferably in **buddha`** and optionally in **ñākta** after it, marginally between “initial *w, t, p*” and “*s, p, k + r + vowel*” (except *päpr-*).

VIII.2. Optionally *št* → *kc* in **kätk**

VIII.3. $C_1C_2 \rightarrow C_2C_2$: *tc; ln* in **wäl**; *s* before *ş* not of ADJ; after *m*, nasals and *p* before sibilant and *c*; *tp, pk* → *pp, kk* in **śäw, bāk** before ~PPP; preferably *ñy, kş* in **wärkşäl, p** after *m* before *ş, w, z, t*; optionally *tq, ns* in **ansuk**, *z* and *r* before **şar** and **śkan**; marginally *pş* in **ᵂpāpşune**, *hm* in **brāhmāñā**.

VIII.4. Degeminate consonants not before vowel or *r*.

VIII.5. Sibilant + *c* → *śś* in native morphemes.

VIII.6. In verse: *-räs* → *-rs*; *ä* (and *e* before “*y + vowel* except *ä*”) drops not in the last syllable if its deletion makes for a permissible cluster; *i-* → *y-* in **ime, eše**.

VIII.7. *äñ* → *iñ* in *v* and preferably in **kapsāñyā, cāñcārā**.

VIII.8. Degeminate consonants (except *pp*) word-initially.

VIII.9. *äw, iy* → *u, i* before consonant.

VIII.10. *är* → *rä* (not after *r*) optionally at word-end.

VIII.11. *ä* → *u* after *q* of **säqä**.

VIII.12. *o* → *ā* in PER. ABL → *äş* (optionally after SG+F+deixis).

VIII.13. *woC* → *waC* before *u* of PPP, also in **wätg**+K (optionally if PPP isn’t weak).

VIII.14. In **āñcāmă** *ñcm* → *ñm* → optionally *ym* or *λm*. *ntss* → *nss*. Optionally *nt-* → *t-* before PER. Preferably **Q** *n* → *än*. *nc* → *ñc*. *n/ñ* → *ñ* before *ñ, ś* after vowel not in **kronşe**. *ñtr* → *ntr*. *s* → *z* after **Q**. Optionally *rchn, rsr* → *rcn, rzt*, marginally *rck* → *rśk*. Optionally *ntw* → *nw* in **pintwāt**.

VIII.15. Optionally *iy* → *y* in Şiyak and marginally elsewhere.

VIII.16. Degeminate consonants not before vowel.

VIII.17. *n, ñ* → *ṇ* after *V* before sibilant and word-finally, preferably before *z, p, tk*. Optionally: *ñ* → *ṇ* before *ś* (preferably before vowel), *n* → *ṇ* before ADV, nasal → *ṇ* before consonant if both belong to Arämpāt.

VIII.18. Degeminate consonants after a consonant except *tt* after *n*, but after *r* only stops/*w* (preferably) and sibilants (marginally).

VIII.19. *lñk* → *lk*, preferably *lzk* → *lsk*, marginally *knz* → *kz*.

VIII.20. *ä* → *u* before “any number of consonants + *q*” and optionally after *q*.
Cq- → *C_uk-*. *qC-* → *k_uC-*. *qä-* → *qu-*. *q* → *k*.

VIII.21. Optionally: in ***pyāpyā*** *āpy* → *āppy*, in ***upādhyā`*** *u* → *u*.

VIII.22. In ***brāhmāṇā*** preferably (in ***hā*** marginally) *h* drops, *ṇ* → *n*.

VIII.23. Marginally: *n* of PL drops after *y*, *l* before *t*; stops are geminated after vowel before “*r* + vowel”, *t* after “vowel + *r*” before vowel.

VIII.24. *-ay* → *-ai* optionally in non-native morphemes.

VIII.25. *ä* drops after vowel.

VIII.26. *ly*, *λλ*, *λ* are written as *ly*.

CHAPTER IX

IX.1. Rules in this chapter are marginal and not applied by the Candrayantra.

IX.2. In verse: *u* → *u*, *i* (before CV) → *i* not in the last syllable if their deletion would make for a permissible cluster (*ä* is written *a* after “*i* + consonant”; *i* is not written before “consonant + *i*”).

IX.3. *är/äl* → *rä(r)/lä* (not next to *r/l*) optionally before consonant.

IX.4. *ly*, *ñ* → *l*, *n* before *i*, *y*, before which also *n* → *ñ*.

IX.5. Nativize non-native letters morpheme (especially *ṣt* → *ṣṭ*). Denativize a letter.

IX.6. *a-*, *o-* → *a*, *o* before CV. Change *ṁ* to *n*.

IX.7. Change nasals to *ṁ* not before vowels. Add *ṁ-* between vowel and nasal.

IX.8. *u*, *ṁ* drop. *p* → *w* and vice versa. *z* → *s*. *hm* → *mm*.

IX.9. Degeminate consonants.

IX.10. *t* is geminated before *w*, *y* after vowels.

IX.11. *ä* → *i* next to *ś*, *ñ*, *y*, *c* (especially on both sides).