Ārśi-Candrakānta by Sergey Malyshev

CHAPTER I

I.1. Ārśi-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 from **pläwtk** on are roots. 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, ḍ, t, d, p, b, z, q* (stops; the first ten have corresponding aspirated stops, written as "stop + h"), *h, hkh* (up to here obstruents), *r, l, λ* (liquids), *y, w, v* (glides), *ñ, m, ṅ, ṇ, n* (nasals). Vowels (V) are: *ä, ă* (short), *a, ā, i, ī, u, ū, e, o, ṛ, 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 ("Ipf", "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 a root or one of the first seven.

I.12. Switch the sequence from stem to ending: before PL not after weak, numeral (except **ṣomă**) or person(~gender); before DU not after double; before gender after adjective; after tense; before noninitial case.

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

After **1** add gender/PL, after **2** number(+OBL), after **3** (gender+number / DU +) deixis or SG/PL + OBL (but after **ᴾänzaṃ** PER, LOC or gender+MED). <u>After causativity</u> add PPA, PPP, GER1, GER2, INF, PPM or tense+person+number+voice. <u>After gender</u> add number

(after **lānt**/ ᔆ**wāpant** + F also NMZ), but case after **vä**, **täräy**. <u>After number</u> add case (after **2**+SG and Kloz+DU also ADJ; after Ag+DU also BAH1). <u>After verb</u> add causativity. <u>After indeclinable, numberless, deixis and initial case</u> add case except Prattika, after **qä** also PL, after PL+deixis also ADJ. <u>After numeral</u> add TEN (not after **şomă**), PLUS (these two not after **śäka**, TEN, PLUS), ORD; gender after **şomă**/**vä**/**täräy**, after others case (after **şäpta** also PL). <u>After relative</u> add gender, after PPP/**mkältāwr**/**ālăk**/**p** also case, after **p** also DU, after **vä**+ORD PER, after **päqälā**+ADJ ACC, ABL; after **knās**+V+PPM and NMZ+BAH1 also NMZ. <u>After qualitative</u> add gender/NMZ. <u>After nouns</u> add number/ADJ, after weak also PL+ADJ.

I.14. Additionally, you may add NOM after Şomă and -*a*`, F after Lānt, POS after Asurā, ADJ after Ksär, BAH1 after Kñuk (except BAH1+NMZ), BAH2 after Pälzäk, HAB after Ri, NMZ after Rişak. Noninitial **ñäkta** loses compatibility with F and NMZ.

I.15. You've built a word as soon as you've chosen noninitial case or voice; you may exit early if the current morpheme is Prattika/Ywār (such words are called "construct forms" and are used in compounds).

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) + an underscore + the first morpheme's name[1]; its meaning coincides with the first morpheme's meaning (plus " (K)" if K is present), e.g. **rişak**, **läg**, **läg**+K yield lexemes ᔆ**rişak** "sage", ⱽ**läg** "see", ᴷ**läg** "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.

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**. <u>Person</u>: after IMP **1**/**3** are impossible. <u>Case</u>: ADV is only possible after **3**+deixis, OBL only in the declared cases, LOCAL only after Saṅkrām, ABL2 only after

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[1] Here they are written as superscript without an underscore.

Ṣurmă(+SG), ABL3 only after Anăpr(+SG), **3**+DIST and **käλme**+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 **täm**+V also ABL3, after **tärk**/**kärs**+V NOM and ACC, after **läm**, **näzv**, **λāw** INS), after **mkältāwr** only ABL3, otherwise after indeclinable (not Ac) and initial case only NOM is possible, after **antu**, **λutār**, **ś`äw** also ABL, after **ṣolār** LOC, after **menāk** INS, after ˡ**snepal** and **neṣ** PER, after **ywār** PER and LOC. After **qä**+PL only NOM and ACC are possible; after ˣ**ālamwäc** NOM is impossible. <u>Causativity</u>: only the ones listed in the "causativity" characteristic are possible. <u>After</u> V PRT is impossible after **qäm**, Ipf after Kläṅk. <u>Number</u>: DU is only possible after **3**~ in stem, **p**~ , **pracăr** 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, ă* 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 doesn't exist, belongs to EMPH or is a *ṣ, y, n, p, t* of PLUS, ADJ, PL, DU, 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. 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°" for short, is change of verb's last vowel, if it's *ä/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, it (1) is *ṣln, ynty, rmnt, mncs*, or (2) doesn't have *r, l, λ, 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.

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CHAPTER II

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

II.2. <u>**Before V**</u>. Vāl before Prs and Träṅk before Opt (not weak GER2) are green, Mläṅk black not before Imp/Opt/IPF/PRIV, Täs yellow before Ipf, **yom**/**śäy** and **täs** red before Imp and Prt. **enz**, **twās** and red are gray before Ipf. **lät** before Prt and **vān** not before Ipf/IMP are green, **āy** and **y** black before Prt and IMP, **pāś** and Wäl gray before Prs and Ipf. Violet except Wäl, **mäsk**, **met** are blue not before Ipf. Before IPF Zäyp and Pär are red and azure, **yām**/**śāw** and **tämp** pink before Ipf and Prs. Optionally: **käläw** before Ipf is gray, **krop** black before Prs, **väyn** in verse and **täkw** are blue. Zārt and pink **käläw** before Ipf, **läg** not before Ipf and violet verbs before PrsEnd change their voice to M.

II.3. <u>**Before K**</u>. Verbs are gray, but short verbs are yellow before Opt. **läyp** before Imp, **wätk**/**päl** (and optionally short verbs in *-k, -q*) before Prt and **näk** not before Ipf are red, Träyk pink before GER2+NMZ, **läm** yellow before IMP. Verbs are blue before PRIV. Yāt and optionally Ṣärp before Opt are green, as is **spārtv** before Prs.

II.4. Cannot be built: 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/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. <u>**Before V**</u>. **āy** → *vä* before Imp, *a* before IMP. Before Ipf *wās*, **qāk**, **läm**, **vāw**, **yām**, **vān**, **ṣtäm** → *äw, ken, ṣäm, āk, yp, träṅk, käλ*. Before Opt/PPP/PRT **y** → *kälk*. Before Imp/Opt **yok**, **śäw**, **pär**, **knās** → *zäwk, tāp, kām, knā* (pink *kñāññ* not before PRIV). **tāk** → *tā* before CON (optionally before **3**+PL), *ṣtāk* before IMP, *nāz* before PPP, *nas* before Prs (*na* before **3**+PL), INAN4, GER2, *ṣ* before IPF. **täs** → *tāw* before Opt/Ipf, *t* before PPP.

II.7. **ṣomă** → *sas* and *sän* before M and F + SG+NOM, *ṣa* before PLUS, *malto* before ORD/NOM. **vä** → *väṣtă* when final and before NOM; *ve, vun, ven* before PLUS, M, F. **täräy** → *täräyā`*, *tärey, taräy* before PLUS, M, TEN. Before ORD **śtwarā**, **päñ** → *śtär, p.* Before TEN **ṣäk, ñäw** → *säk, nma*.

II.8. **ālăk** → *ālam* before **vä**. To **p** add *ām-* before ~DU and *-äq* before (DU+)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 **neṣ** 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 **ānăndā**/**anăpr**, preferably in **märkampăl**. In **ṣula** *u* → *ä* before INDECL. Optionally *ur* → *ru* in **ṣurmă**, **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 drops not before F. Before number in nouns *-a`* drops. In verse **wmār, penu, namo**, *mahā* → *wumār, pe, nmo, mhā*. In **śrāddhe** optionally *-e* → *ă* before NMZ. **päśră** → *pärśă* before INAN4, optionally elsewhere. *äl* → *al* before QUAL in **eṅkäl** and marginally **wärkṣäl**.

II.10. Optionally **yäwka, päsqā, eśe, śreṣṭhi, ślokă, śoλākā, aṅgirathe** → *yäqa, pässākā, iśe, śriṣṭhi, ṣλokă, ṣoλākā, aṅkirase*. Preferably **asaṃkhye** → *asaṃkhe*. Before ADJ optionally **śoṣäy** → *śoṣ.* **ag, ālăk** → *eś, ālek* before PREF.

II.11. **kāsäwă** → *krant* before gender not before SG+NOM, *kränt* before F+SG, optionally *kāsäwe* before M. **sasăk, kāv`älte, mokă, nātg** → *snākă, kränzäy, māke, nāśy* before F. **zopăz, arkänz** → *śāv`ă, arkant* before gender+PL. Before SG+NOM/ACC **kow** → *ki*. Before (M+)SG+NOM **lev`ă, qlewā, koṇ, länt** → *λi, qli, ku, v`äl*. **länt, śri, buddha`** → *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 → *ac, an, ā, ñy* after **täṅk~, läṅk~, bärk~/kon, wṣe**. INDECL → *ārc, ār, älā`, men* after DU, **läytk~, yäw~, śpāl**. PPP drops before POS, → *we* when weak after **yäṭ~**; it loses its *r* before gender, NMZ, DU, PL, K+(SG+)NOM/ACC and when strong. GER lose *ă* before NMZ/ADJ/PL (not in **ʷrkäl, ʷel, ʷśwāl**).

II.13. ORD → *winäw* after **şomă**, *d* after **vä**, **täräy**, **śtwarā**, *äşd* after **şäk**; its *d* is palatalized after **ālăk~** or before gender except M+SG+NOM; add -*an* to it after **vä** before (M+SG+)INS/LOC, otherwise optionally (1) after **ālăk~** and (2) before M+SG not before NOM/GEN. After **vä**, **şäk**, *a* TEN → *iki*, *säk*, *uk*. Add -*i* to TEN before ORD.

II.14. ADJ → `*äy* after Ñăkta, which lose their -*kā*, -*a*, -*ā*, and optionally after LOC; *nt* `*äy* after **şme**, **qlewā**, **atră**, which change *wā*, *ă* to Ø, *o*.

II.15. After causativity INAN1 → *i*, *äy*, *ä*, *ke*, *me*, *m*, *mă*, *ă*, *äowä*, `*e* after **pärsk**, **wärp/yär**, **käläw/läg**, **v`ras**, **y**, **śäwr/sāry**, Pälāk, Käln, Krās, Pāś; INAN3 → *tār*, *mäśśäw*, *z* after **y**, **sey**, **käläw**; INAN4 → Ø, `*oññe*, *mă*, *ā*, *ntā*, *şinā*, *enā*, *onā*, *ānā*, *ārā*, *ānzā* after **krop**, **ştäm**, **tāk**, **käry**, **wärk**, **kärk**, Värs, **bäl**, **vāl**, **päyk**, **pälk**; ANIM1 → *om* after **värs** (*ă* before PL, ~GEN), *ā* after **läg** (which becomes azure) and **zäyg**; ANIM2 → *ñe* after **kāp**; QUAL1 → *äśănäw* after **läq** (*äśă* before NMZ), QUAL2 → *arşke*, *ez*, *ālz*, *äră* after **pot**, **pälk**, **wätk,** Täp; QUAL3 → *ră* after **ās**; REL1 → *azum* after **käry**, REL2 → *matäw*, `*e*, *äy* after **y**, **pās/kän**, **māsk**; REL3 → *äam*, *tā* after **tämp/käwλp**, **säl**.

II.16. Not after causativity INAN1, INAN4, ANIM1, QUAL1, QUAL2, QUAL3, REL1, REL2, REL3 → `*i* (before it *äw* drops), *ari*, *ikā*, *assäw* (before it *ime* → *yme*), *z*, *wāz*, *om* (not after **şäpna**), *äw*, *änäw*.

II.17. INAN4 → *ññe*, *nā*, *inā* after **wşe**, **poke**, **prär**; ANIM1 → *tā*, *itā*, *aşşe*, *āw*, *enäw* after **kuryar**, **lokă**, **şäñäy**, **wacă**, **sāntäkă/yokmă**; QUAL1 → *āw*, *essäw*, *säw* after **parn**, **āk**, **kip/eṅkäl**; QUAL3 → *āz* after **ᵂklyu**; REL1 → `*äy*, *ikā* after **kaşt**, **kritān**; REL2 → *äy* after **wäsā** (which loses -*ā*). In QUAL2 *ss* → *s* after Klop~.

II.18. QUAL2 *z* → *ză* after *mă* INAN1 before F+PL. ANIM1 drops before NMZ; its -*ā* drops before F. Optionally add -*āw* to REL3 in -*m* before M+SG+NOM. Add *āt*- to ANIM1 after **säqă**. To NMZ, BAH1, REL3, QUAL3 add *z*- after Omălă, *az*- after Ekără and optionally **āk**. BAH2 drops after long vowels. NMZ → *ñe* after **purccamāw** (which loses -*āw*), *rñe* after *w*, *re* after **ᵠparno**, *ne* after **pās**+V+PPP, *iśparn* after **ārāntā**, **buddha`**. In verse *ă* → *ä* in *äśănäw*. "BAH1 (and optionally BAH2) +NMZ" drop. NMZ optionally drops after Kāsäwă (before PL only after **kärme**) and between **ortā** and BAH1. *m* + BAH2 → Ø + *m*.

III.1. IMP → *ä* before ~PL+ACT , after black~ drops and becomes PrsEnd before ~PL, PrtEnd before ~SG. IPF → PrsEnd *e* 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* between PrtEnd and SG. **2** → *s* before PL+ACT not after PrsEnd, drops between IMP and SG. **3** → *s* before ~SG~NOM, *ṇt* before PL, *r* between PL+ACT and PrtEnd, drops before SG+ACT. Person X drops before Y+OBL, if X = **3** or Y = PL (but becomes *nä* in stem).

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

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

III.5. Not before ~SG+NOM: add -*āw* to *ăk* before F+PL; -*ant* to **ārkäy** 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 **ñäkta**; -*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: -*äs`* before (M+)PL+NOM, -*änt* 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 → *äṣa* and *`äqa* after **1** not before PL, ~GEN/OBL. F → *o`* and *e* after **3** before PL and SG+GEN; *eññā`* after **ñäkta**; *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 **mäśkitā**); *olāñcā* after **kärta**; *ikā* marginally after PPA.

III.7. SG → *än* in ending not before NOM/GEN: after gender/name/strong (not *t*, **ṣomă**, ORD+M after **vä** and optionally **śtwarā**), **p**+M, **mäśkitā** before ACC, optionally **lānt**+F and *t* in **kāsäwă**+M; after **2** in stem not before GEN/OBL → *`äwa* (*äw* before NOM).

III.8. DU 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; drops between **päśśă** and ADJ and after **p** not before gender.

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, -o*); before NOM, ACC, INS: *ntäw* optionally after *-a* and **waştă**, **arthă**, but (not in Säqă and ^w**zpok** before INS) *nt* after *-a, -ă* (optionally before INS after *-ră, -lă*); `*iy, is, än,* `*, wā* `*, äwā* after **wal**, **kor**, Wram, *-ā, bält-*, Prār (and optionally <sup>w</sup>**cmol**, 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, v + e*", *äw* marginally after **āṅkăr**.

III.10. Add *-n* to *ă, a* of qualitative/**şomă**/**sasăk** 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 **ālăk** (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*, Ñäkta), *ñi* after **1,2**~ (`*i* after 1+M~), *i* after Pācăr and non-feminine names (except **metrăk**) in consonant, *es* after *ă, a* of name/strong/creature (not **oṅkă**), ^w**yärk**, ^w**pälzäk**, **āñcämă**, **lävā**, optionally **käntwā**, *e* preferably after ^c**pättāñkät** and marginally **kapśăñyā**/**oppălā**, *s* after name/creature in *-e/-i/-ī* or strong in *-e* (not ANIM1); Ø, *u, o* after **länt**, **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 → *śäl* optionally after *än* after *i, ī, e, 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, *kotā* optionally after ORD+PER not after **ālăk**~.

IV.1. In PL ` → *k* before vowel.

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

IV.3. In **läyt** optionally *ā*-ablaut; in **spārtv** marginally *ä*° before K+PRT. In **ştäm**, **skāy**, **pälk** and **bäl**/**säl**/**pälzk** `*ä*°, *e*°, *o*° and *a*° before ~INAN4/REL3. In **rät** *o*° before ~INAN1. *a*° in **räp**, **wärp** before ~INAN or (not in Bäl, Pāś, **läg**, **täṅk**, **päwtk** and verbs with "ä + liquid + stop") before V/K + *z* or vowel other than *ä* (not of Ipf/Prt). In **käläw** `*ā*° before V, but `*ä*° before INAN1. `*a*° in green/red before ~Ipf. Before V+Ipf: in **zälp**, **zäm** `*a*°, in violet *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 ~Imp. Before V: add -` to **śāw** before PRT, -*s* to **käläw** before Imp/Ipf/Opt, to **āy** before PRT (optionally before 3+PL), -*än* to Yäk before Opt, to Päk, Wäl (not in -*n*) and gray **käläw** before Ipf. Add -*ās* to yellow verbs. Before V (with **täm** also K) + Ipf add -*n* to gray and blue Räy and replace the last letter of blue Kät with *n*. In verbs *kn* → *äṅk* after obstruents, *ln* → *ll* in Räy, in **pāś** *śn* → *n* (but *nś* before V+IPF). Add -*n* to green verbs (not in -*n*) before ~Opt except **träyk**/**zärk**+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 → *äsä* after red/violet before *ā* except IMP~ACT, `*ă* after green, *ă* after blue before IPF and pink/yellow, *äsă* after gray, *iññă* after **ṇäw** before Ipf, *äññă* (before which *s* → *s*`) not after verbs (*şäññă* after **säqă**, **wañi**), after **yäks** before Ipf, after **āks** (optionally before OPT), **oks** (optionally before PPP), **väy** not before Ipf; V → *isă* after **āks**, **oks** before Ipf, *ā* after **śāw** before PPM.

IV.7. *äsă* drops before Imp after short verbs except Läg, before QUAL2 after **rät**.

IV.8. Empty causativity (not before `*ä*, *mă* or vowel) → *ā* after blue, `*a* after violet **spārtv** not before IPF, *a* after violet not before PRT/IPF except after **näk** before OPT (but V → *o* after **täm** 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 (K in Wäl) before IMP~ACT (optionally PL), in red before K+CON, in blue before V + CON~SG/PRT~PL + ACT; `ä° in blue (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*/*ṣ*/*z* and in **pärk**, **käln**.

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

IV.14. Initial palatalization: in **tämp** not before ~INAN1, in **tärk**, **spārtv** before it; in **läq**, **läwtk** before ~Imp/Opt; before V in **täm**/**qäm** before Opt, in **täk** before Ipf, in **zär** before GER1; before K in Kärs (optionally in **läwt** before Opt and **spärk**); before K (not *äsǎ*) + Imp in *z*-, **ṣtäm** 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 Kon, otherwise before PREF/~PRIV add *a*- to the root. To verbs not starting with vowel or "y/w + long vowel + nasal", before ~PPP (unless blue) or K+PRT (unless red/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 → *ǎ*: before CON not after *k*, before PRS after **qāk**, **täk**. 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 *ǎ* except *mǎ* (and GER before F) and after *kā* (not to F). Add -*yä* to *e*/*i*/*o* before vowel of case or *um*, *äw*, *änt*.

V.3. *ǎ*, *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*, *ǎ* drop after vowel (+ `) not before *nt*.

V.6. *e*, *ǎ* → ` 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 **ālăk, mättăk**), before M+SG *t* (unless bhe) in Śātă not before *ā* or NOM (in **ālăk** optionally), *l* (and *t, l* in **ālăk, mättăk**) 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/ḍ*.

V.12. Bhi → *a* in Śänā and optionally Sewā. Bhi *ā, a* drop after "non-first vowel (not *ä*) + consonant (+ `)". Bhi drops in Neṣ and optionally Kalpă. Add -*a* to Kṣur before ṣ optionally. *ā* in EMPH drops optionally.

V.13. *w → y* after *e/y* not before *ā* or *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 *ṇt* `, 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/ṭ/k/sk/ṣäy*) after "V + glide (*v* only native; not in **skāy** before *äs*)" and "C + *w*"; *ä* in verbs drops after "V + *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. Non-first *a/ā → ä* in reduplicated verb. If the first vowel is long and the second vowel is *a/ā* in **bāt**/tense/causativity/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 *ṭ*.

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* between obstruent and C and *ă* between "*ä* + liquid" and *nt* of PL → *u*.

VI.14. Stops are geminated before word-final *r* marginally.

VI.15. Bhu drops not in verbs (in Yärśarā optionally), in **1** only after red/violet~ (optionally after PRT) not before EMPH, in PRT/IPF after green verbs~ and not after `ä/äy (PRT optionally after **käläw**+V).

VI.16. ă drops before roots.

VI.17. Optionally F ā drops between **ñäkta**+ADJ and SG+ACC.

VI.18. V *äsä → äzä* after **yām** and optionally **āl**.

VI.19. After consonant except *y*: *ṣ → āṣ* in ADJ after ~PL/DU/LOC not after **ysār**, **kanwe**; *ś → āś* in GEN after ~PL not after *s*.

<u>**VI.20**</u>. *ă → ä*: not in the first syllable if the next vowel is not *ä*, except **mättăk** before *yāp*; before PPA (not after **v`les**+V) before vowel other than *ä* after **pāś**~ or unless the previous vowel is *ä/i* (but the one before it is not *a*). *ă → a*.

VI.21. *-ñy → -n* in verse.

VI.22. *ts → z, täsäs → zz* before vowel.

<u>**VI.23**</u>. Bho *y, w/v → i, u* after *ä*/C, but *ä* in **läyp** before K+PPP+gender, *o* in **kāv`älte**. *ā/a/o* + bho *w → o. äy → iy* before V of F/case: in INF, after **ñäkta**, *w*` and optionally **päqälā**.

VI.24. Nativize native morphemes (and preferably **buddha**` before NMZ).

CHAPTER VII

VII.1. *ä* drops before "` + vowel".

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

VII.3. C is palatalized before *p, w, r* + ` in native morphemes; *tk`* → *t`k*; *ṣ`t →* *ṣt*`. Before ` in native morphemes (except Ātäl and optionally **ṣula**) and Brāhmăṇā: *k/q/z/ṣ → ś, l → λ, n/ṅ/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* **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/ñ/λ* + *t/ṣ*; (5) if C₂ is *n* or liquid and C₁ is different (in NMZ preferably); (6) to *-m* not after *m/ñ/r*; (7) to *ṣ* after *ṣ* of **käläw**.

VII.6. *ṣ → s* in PROX if there is *s* in the word.

VII.7. *än* drops after POS.

VII.8. *ä* drops not before "C not before V".

VII.9. *än* and *ān* drop after *n, ṇ* (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 *ān* and (3) if *n* is bha only in verse. Optionally *n* drops before *n* of SG.

VII.10. Bha *h, j, v → k, c, p*.

VII.11. Preferably *v → 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 of **bāt**), optionally *ś* of Ñäkta, preferably *ṣ*.

VII.13. Optionally *itk → ätk* in verbs except **yätk**.

VII.14. In **vān** *wā → we, pw → p*. In **pälzk** *zk → sk* after vowel.

VII.15. *lalänt → lalnt →* preferably *lant* (at least *lalt*). Optionally in DU/PL *änt → nt* between "long V + *l, r, y, w* (not *āw*) preceded by at least one syllable" and "V/*w*".

VII.16. Not in verb, bha *w* drops, as optionally does *y* after *e/i* before DU/PL.

VII.17. Bhe nasal drops in **vān**/**vä**/DU after "*w + e/u*" not after *n*.

VII.18. Sibilant + *z* of INF → *ss*.

VII.19. Add *-ä* to C before "*r, l* + C" (except *rrC*), to *k* before *lñl* optionally, to *waṣt* before **läm** marginally.

VII.20. *lñl → λλ*. *ñ* drops between CC and C and changes to *äñ* between "V + C_1 except *ñ*" and C_2 (except if C_1 is stop and C_2 is *l* or *m*).

VII.21. *y → i* after consonant not before vowel.

CHAPTER VIII

VIII.1. *ä* drops not before "C not before V", preferably in **buddha`** and optionally in **ñäkta** after it, marginally between "initial *w, t, p*" and "*s, p, k + r* + V" (except *päpr-*).

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

VIII.3. $C_1C_2 → C_2C_2$: *tc*; *s* before *ṣ* not of ADJ; after *m*, nasals before sibilant and *c*; *tp, pk* in **śäw**, **bäk** before ~PPP; preferably *ñy, kṣ* in **wärkṣäl**, *p* after *m* before *ṣ, w, z, t*; optionally *tq, ṅś* in **aṅśuk**, *z* and *r* before **ṣar** and **śkan**; marginally *pṣ* in **ʷpāpṣune**, *hm* in **brāhmǎṇā**.

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**, **eśe**.

VIII.7. *äñ → iñ* in V and preferably in **kapśăñyā**, **cäñcără**; optionally *äl → il* in **bältäk**.

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 if the resulting cluster is permissible.

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

VIII.12. *o → ā* in PER. ABL → *äṣ* (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 **āñcämă** *ñcm → ñm →* optionally *ym* or *λm*. *ntss → nss*. Optionally *nt- → t-* before PER. Preferably Q *n → än*. *nc → ñc*. *n/ṅ → ñ* before *ñ*, *ś* after vowel not in **kroṅśe**, **aṅśuk**. *ñtr → ntr*. *s → z* after Q. Optionally *rchn, rsr → rkcn, rzr*, marginally *rck → rśk*. Optionally *ntw → nw* in **pintwāt**. *ln → ll* in **wäl**.

VIII.15. Optionally *iy → y* in Ṣiyak, marginally elsewhere.

VIII.16. Degeminate consonants not before vowel.

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

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

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

VIII.20. *ä → u* before "any number of consonants + *q*" and optionally after *q*. *Cq- → C$_u$k-*. *qC- → k$_u$C-*. *qä- → qu-*. *q → k*.

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

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

VIII.23. Marginally: *n* of PL drops between *y/l* and *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. *λy, 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: $u \to {}_u$, *i* (before CV) $\to {}_i$ not in the last syllable if their deletion would make for a permissible cluster (*ä* is written *a* after ${}_iC$; ${}_i$ is not written before *Ci*).

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

IX.4. *lyi, ñi, ni, ñy, ny* $\to$ *li, ni, ñi, ny, ñy*.

IX.5. Nativize non-native morphemes. Denativize a letter (especially *ṣt* $\to$ *ṣṭ*).

IX.6. *a-, o-* $\to {}_a$, ${}_o$ before CV. Change *ṃ* to *n*.

IX.7. Change nasal to *ṃ* after V not before V. Insert *ṃ* between vowel and nasal.

IX.8. ${}_u$, *ṃ* drop. *p* $\to$ *w* and vice versa. *z* $\to$ *s*. *hm* $\to$ *mm*.

IX.9. Degeminate consonants.

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

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