

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 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, t, ḍ, ṭ, 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, ṇ, ṅ, n* (nasals). Vowels (V) are: *ä, ă* (short), *a, ā, i, ī, u, ū, e, o, ɾ, 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 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 **Pānzam** PER, LOC or gender+MED). After causativity add PPA, PPP, GER1, GER2, INF, PPM or tense+person+number+voice. After gender add number

(after **lānt**/**swāpant** + F also NMZ), but case after **vä**, **täräy**. After number add case (after **2**+SG and Klotz+DU also ADJ; after Ag+DU also BAH1). After verb add causativity. After indeclinable, numberless, deixis and initial case add case except Prattika, after **qä** also PL, after PL+deixis also ADJ. After numeral add TEN (not after **šomă**), PLUS (these two not after **śäka**, TEN, PLUS), ORD; gender after **šomă/vä/täräy**, after others case (after **šäpta** also PL). After relative add gender, after PPP/**mkältāwr/älāk/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. After qualitative add gender/NMZ. After nouns add number/ADJ, after weak also PL+ADJ.

I.14. Additionally, you may add NOM after **šomă** and **-a`**, F after **Lānt**, POS after **Asurā**, ADJ after **Ksār**, BAH1 after **Kñuk** (except BAH1+NMZ), BAH2 after **Pälzāk**, HAB after **Ri**, NMZ after **Riṣak**. Noninitial **ñākta** 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 name¹; its meaning coincides with the first morpheme’s meaning (plus “(K)” if k is present), e.g. **riṣak**, **läg**, **läg**+K yield lexemes **Ṡriṣak** “sage”, **Ṽläg** “see”, **Ṡläg** “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. Person: after IMP **1/3** are impossible. Case: ADV is only possible after **3**+deixis, OBL only in the declared cases, LOCAL only after **Saṅkrām**, ABL2 only after

¹ Here they are written as superscript without an underscore.

Şurmă(+SG), ABL3 only after Anăpr(+SG), **3**+DIST and **kälme**+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 NOM and ACC, after **läm**, **näzv**, **lāw** INS), after **mkältāwr** only ABL3, otherwise after indeclinable (not Ac) and initial case only NOM is possible, 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” characteristic are possible. After 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 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. 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/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 *şln, 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.

CHAPTER II

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

II.2. Before V. Vāl before Prs and Tränk before Opt (not weak GER2) are green, Mlänk black not before Imp/Opt/IPF/PRIV, Täs yellow before IpF, **yom/şäy** 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, **pās** 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/şāw** and **tämp** pink before IpF and Prs. Optionally: **kälāw** before IpF is gray, **krop** black before Prs, **vāyn** in verse and **täkw** are blue. Zärt and pink **kälāw** before IpF, **läg** not before IpF 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/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 Şärp 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. Before V. **āy** → *vä* before Imp, *a* before IMP. Before IpF *wās, qāk, läm, vāw, yām, vān, ştam* → *äw, ken, şäm, āk, yp, tränk, käl*. Before Opt/PPP/PRT **y** → *kälk*. Before Imp/Opt **yok, şaw, pär, knās** → *zäwk, tāp, kām, knā* (pink *kñāññ* not before PRIV). **tāk** → *tā* before CON (optionally before **3**+PL), *ştāk* before IMP, *nāz* before PPP, *nas* before Prs (*na* before **3**+PL), INAN4, GER2, *ş* before IPF. **täs** → *tāw* before Opt/IpF, *t* before PPP.

II.7. şomă → *sas* and *sän* before M and F + SG+NOM, *şa* before PLUS, *malto* before ORD/NOM. **vă** → *văştă* when final and before NOM; *ve*, *vun*, *ven* before PLUS, M, F. **tărăy** → *tărăyā`*, *tărey*, *taräy* before PLUS, M, TEN. Before ORD **ştwară**, **păñ** → *ştär*, *p*. Before TEN **şäk**, **ñäw** → *säk*, *nma*.

II.8. älăk → *alam* before **vă**. 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 **tăpär** 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, *căr* 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* 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. **pāśră** → *pārśă* before INAN4, optionally elsewhere. *äl* → *al* before QUAL in **eñkäl** and marginally **wärkşäl**.

II.10. Optionally **yăwka**, **păsqă**, **eşe**, **şreşthi**, **şlokă**, **şolākă**, **aṅgirate** → *yăqa*, *păssākă*, *işe*, *şrişthi*, *şlokă*, *şolākă*, *aṅkirase*. Preferably **asaṃkhye** → *asaṃkhe*. Before ADJ optionally **şoşăy** → *şoş*. **ag**, **älăk** → *eş*, *ălek* before PREF.

II.11. kăsăwă → *krant* before gender not before SG+NOM, *krănt* before F+SG, optionally *kăsăwe* before M. **sasăk**, **kāv`älte**, **mokă**, **nătg** → *snākă*, *krănzăy*, *măke*, *năşy* before F. **zopăz**, **arkănz** → *şāv`ă*, *arkant* before gender+PL. Before SG+NOM/ACC **kow** → *ki*. Before (M+)SG+NOM **lev`ă**, **qlewă**, **koṇ**, **lănt** → *li*, *qli*, *ku*, *v`ăl*. **lănt**, **śri**, **buddha`** → *v`ălă*, *śri*, *păttă* (optionally plus *ñ*) before **ñăkta**. When final, add *-ă* and *-s* to **kon** and **kunti**. Before roots, **mă** → *a*, but *ă* before **śrāddhe**.

II.12. PREF → *ac*, *an*, *ă*, *ñy* after **tănk~**, **lănk~**, **bărk~/kon**, **wşe**. INDECL → *ărc*, *ăr*, *ălă`*, *men* after DU, **lăytk~**, **yăw~**, **şpăl**. PPP drops before POS, → *we* when weak after **yăt~**; 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 **vă**, **tărăy**, **ştwară**, *ăşd* after **şăk**; 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 (1) after **ălăk**~ and (2) before M+SG not before NOM/GEN. After **vă**, **şăk**, *a* TEN → *iki*, *săk*, *uk*. Add *-i* to TEN before ORD.

II.14. ADJ → `äy after **Ńăkta**, which lose their *-kă*, *-a*, *-ă*, and optionally after LOC; *nt`äy* after **şme**, **qlewă**, **atră**, which change *wă*, *ă* to *Ø*, *o*.

II.15. After causativity INAN1 → *i*, *äy*, *ă*, *ke*, *me*, *m*, *mă*, *ă*, *ăowă*, `e after **părsk**, **wărp/yăr**, **kălăw/lăg**, **v`ras**, **y**, **şăwr/săry**, **Pălăk**, **Kăln**, **Krăs**, **Păs**; INAN3 → *tăr*, *măşşăw*, *z* after **y**, **sey**, **kălăw**; INAN4 → *Ø*, *oññe*, *mă*, *ă*, *ntă*, *şină*, *enă*, *onă*, *ănă*, *ără*, *ănză* after **krop**, **ştăm**, **tăk**, **kăry**, **wărk**, **kărk**, **Vărs**, **băl**, **văl**, **păyk**, **pălk**; ANIM1 → *om* after **vărs** (*ă* before PL, ~GEN), *ă* 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, *äy* 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 → `äy, *ikă* after **kaşt**, **krităn**; REL2 → *äy* 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 **păs+V+PPP**, *işparn* after **ărăntă**, **buddha`**. In verse *ă* → *ă* in *ăşănăw*. “BAH1 (and optionally BAH2) +NMZ” drop. NMZ optionally drops after **Kăsăwă** (before PL only after **kărme**) and between **ortă** and BAH1. *m* + BAH2 → *Ø* + *m*.

CHAPTER III

III.1. IMP → *ä* before ~PL+ACT, after black~ drops and becomes PrsEnd before ~PL, PrtEnd before ~SG. IPF → PrsEnd *e* after **y/täk**+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, *nt* 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 *āk* before F+PL; *-ant* to **ärkäy** 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 **mokā** 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, → *ǎ* after **3** before SG not before ~NOM. M and F → *äša* and *äqa* after **1** not before PL, ~GEN/OBL. F → *o`* and *e* after **3** before PL and SG+GEN; *eññā`* after **ñäkta**; *ǎ* optionally between **lānt** and PL; *ā`* after *e*; *y* after *ś*, *z*, GER before SG+NOM; *ñcā* after *ā* not in adjectives (optionally after **mäskitā**); *olāñcā* after **kārta**; *ikā* marginally after PPA.

III.7. SG → *än* in ending not before NOM/GEN: after gender/name/strong (not *t*, **şomă**, ORD+M after **vă** and optionally **ştwară**), **p**+M, **mäskitā** 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 *ǎ*, **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 **päśśä** 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 **waṣṭă**, **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-*, **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 qualitative/**ṣomă**/**sasăk** before F+PL (then PL drops), *ṣ-* 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, **kayurṣā**, **qlewā**), *āp* after masculine gender/strong/name (not *-ā`*, *u*, *ū*, *Ñākta*), *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 **oñkā**), **Wyärk**, **Wpälzäk**, **āñcămă**, *lävā*, optionally **käntwā**, *e* preferably after **ᶑpättāñkāt** and marginally **kapsăñyā**/**oppălā**, *s* after name/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*(*`*) of strong/name. ABL2, ABL3 → *le*, *aśśi* after indeclinable (not **anăpr**), *iñcā`*, *i* after **särka** (*i* also after **ac**), ABL3 → *aṣi* after **ṣurmă**. Add *an-* to word-initial ABL, ALL.

III.15. EMPH → *ak* after **nun/qä**+NOM, *kotā* optionally after ORD+PER not after **ālăk**~.

CHAPTER IV

IV.1. In PL ` → *k* before vowel.

IV.2. -*ǎk* before gender changes *ǎ* to gender's shape (in case of M, only before PL, optionally before ACC), but in case of **ālǎk**+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*^o before K+PRT. In **štām**, **skāy**, **pāl̄k** and **bāl̄/sāl̄/pāl̄zk** `ä^o, e^o, o^o and a^o before ~INAN4/REL3. In **rāt** o^o before ~INAN1. a^o in **rāp**, **wārp** before ~INAN or (not in Bäl, Pās, **lāg**, **tānk**, **pāwtk** and verbs with “ä + liquid + stop”) before V/K + z or vowel other than ä (not of IpF/Prt). In **kälāw** `ā^o before V, but `ä^o before INAN1. `a^o in green/red before ~IpF. Before V+IpF: in **zālp**, **zām** `a^o, in violet *ā* → *a*, in Mläwsk a^o, in **zārt** `e^o. In Bäl *ā*^o before V not before IpF/*ārā*.

IV.4. Add -*n* to **āw**/**lāt** before V+PPP, to **sāy** before ~IpF/PRIV and optionally ~Imp. Before V: add -` to **śāw** before PRT, -*s* to **kälāw** 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 **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 Kāt 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**/**zārk**+K+GER2+NMZ. *tn* → *nt* in **lāt**.

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, `ä after green, *ǎ* after blue before IPF and pink/yellow, *äsä* after gray, *iññä* after **nāw** before IpF, *äññä* (before which *s* → *s`*) not after verbs (*šäññä* after **säqä**, **wañi**), after **yāks** before IpF, after **āks** (optionally before OPT), **oks** (optionally before PPP), **vāy** not before IpF; V → *isä* after **āks**, **oks** before IpF, *ā* after **śāw** before PPM.

IV.7. *äsä* 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, `a after violet **spārtv** not before IPF, *a* after violet 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 (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/ş/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** before it; in **läq, läwtk** before ~Imp/Opt; before v in **täm/qām** before Opt, in **täk** before IpF, in **zär** before GER1; before k in KärS (optionally in **läwt** before Opt and **spärk**); before k (not äsä) + Imp in z-, **štäm** 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 → ǣ: 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 ǣ except mǣ (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. ǣ, 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, ǣ drop after vowel (+ `) not before nt.

V.6. e, ǣ → ` 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 Šātā not before *ā* or NOM (in **ālāk** optionally), *l* (and *t, l* in **ālāk, mättāk**) before F+SG.

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

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

V.11. *`* drops after *k/d*.

V.12. *Bhi* → *a* in Šānā and optionally Sewā. *Bhi ā, a* drop after “non-first vowel (not *ä*) + consonant (+ *`*)”. *Bhi* drops in Neş and optionally Kalpā. Add *-a* to Kşur before *ş* 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 *ǎ* → *a* before PPM.

VI.2. *ǎ* in causativity → *`ǎ* 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 *yǎ*), drops with **sāry** before *m*.

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

VI.5. Before PPP *āwä* → *o*.

VI.6. *ä/ǎ* 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 “C + *w*”; *ä* in verbs drops after “V + *w*”.

VI.7. *ā, a, ǎ, 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 → *ǎ* (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. *ǎw* and optionally *āw* drop if *w* belongs to 1.

VI.13. *w* between obstruent and C and *ǎ* 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 Yārśārā 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. *ä* drops before roots.

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

VI.18. *väsä* → *üzä* after **yām** and optionally **āl**.

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

VI.20. *ä* → *ä*: not in the first syllable if the next vowel is not *ä*, except **mättāk** before *yāp*; 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*). *ä* → *a*.

VI.21. *-ñy* → *-n* in verse.

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

VI.23. 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 **ñākta**, *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 **Mske** and not in verb.

VII.3. C is palatalized before *p*, *w*, *r* + ` in native morphemes; *tk`* → *t`k*; *ş`t* → *št`*. Before ` in native morphemes (except **Ātāl** and optionally **şula**) and Brāhmāṇā: *k/q/z/ş* → *ś*, *l* → *λ*, *n/ñ/ṇ* → *ñ*, *t* → *c*, *s* → *ş*. Delete `.

VII.4. *ş* → *ś* before *ś/c*.

VII.5. Add *ä-* to bha C₂ after C₁: (1) to *c* **2** not after *ş*; (2) to *-s* not after *r/s*; (3) if both are obstruents except “sibilant + *p/t/t`*” and optionally *kş* after V; (4) if they are *m/ñ/λ* + *t/ş*; (5) if C₂ is *n* or liquid and C₁ is different (in NMZ preferably); (6) to *-m* not after *m/ñ/r*; (7) to *ş* after *ş* of **käläw**.

VII.6. *ş* → *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 **Ñākta**, 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 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 PL.

VII.17. Bhe nasal drops in **vān/vä**/DU after “*v/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 *wašt* before **läm** marginally.

VII.20. *lñl* → *λλ*. *ñ* drops between CC and C and changes to *äñ* between “V + C₁ except *ñ*” and C₂ (except if C₁ is stop and C₂ 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 **ñākta** after it, marginally between “initial *w, t, p*” and “*s, p, k + r + V*” (except *päpr-*).

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

VIII.3. C₁C₂ → C₂C₂: *tc*; *s* before *ṣ* not of ADJ; after *m*, nasals before sibilant and *c*; *tp, pk* in **sāw**, **bäk** before ~PPP; preferably *ñy, kṣ* in **wärkṣäl**, *p* after *m* before *ṣ, w, z, t*; optionally *tq, ṇś* in **añśuk**, *z* and *r* before **ṣar** and **śkan**; marginally *pṣ* in **ᵂpāṣune**, *hm* in **brāhmāṇā**.

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 **kapśāñyā**, **cāñcārā**.

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

VIII.9. *äu*, *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 → *äš* (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 **āñcāmā** *ñcm* → *ñm* → optionally *ym* or *λm*. *ntss* → *nss*. Optionally *nt-* → *t-* before PER. Preferably **Q** *n* → *än*. *nc* → *ñc*. *n/n̄* → *ñ* before *ñ*, *ś* after vowel not in **kronše**, **añśuk**. *ñtr* → *ntr*. *s* → *z* after **Q**. Optionally *rchn*, *rsr* → *rken*, *rzt*, marginally *rck* → *ršk*. Optionally *ntw* → *nw* in **pintwāt**. *ln* → *ll* in **wäl**.

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

VIII.16. Degeminate consonants not before vowel.

VIII.17. *n*, *ṇ* → *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 (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: *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: $u \rightarrow _u i$ (before CV) $\rightarrow _i$ not in the last syllable if their deletion would make for a permissible cluster (\ddot{a} is written a after $_i C$; $_i$ is not written before Ci).

IX.3. $\ddot{a}r/\ddot{a}l \rightarrow r\ddot{a}(r)/l\ddot{a}$ (not next to r/l) before consonant.

IX.4. $lyi, \tilde{n}i, ni, \tilde{n}y, ny \rightarrow li, ni, \tilde{n}i, ny, \tilde{n}y$.

IX.5. Nativize non-native morphemes. Denativize a letter (especially $\$t \rightarrow \t).

IX.6. $a-, o- \rightarrow _a, _o$ before CV. Change η to n .

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

IX.8. $_u, \eta$ drop. $p \rightarrow w$ and vice versa. $z \rightarrow s$. $hm \rightarrow mm$.

IX.9. Degeminate consonants.

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

IX.11. $\ddot{a} \rightarrow i$ next to $\acute{s}, \tilde{n}, y, c$ (especially on both sides).