SEGMENTAL PHONOLOGY
OF MODERN STANDARD RUSSIAN

by

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B.S., Duke University (1958)

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Segmental Phonology of Modern Standard Russian
Theodore M. Lightner

Submitted to the Department of Modern Languages on May 10, 1965, in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

We give a large part of the phonological component of Modern Standard Russian. In general we have endeavored to avoid repetition of results that are by now well-known; thus, for example, we have not discussed rules of akanye, of on- and off-glide prediction, of consonant truncation in CCC clusters etc.

Superficial examination of Russian reveals that at least three coexistent systems of phonology must be distinguished. Historically, the three systems represent real Russian (+R) forms, Church Slavic (-R) forms, and unassimilated foreign loan (-S) forms. The division is binary:

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+R  -R  -S
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Our primary interest has been with the +S forms, in particular, the +R branch.

Thesis Supervisor: Morris Halle
Title: Professor of Linguistics
<table>
<thead>
<tr>
<th>章</th>
<th>内容</th>
<th>页码</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Index of Rules</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Preface</td>
<td>8</td>
</tr>
<tr>
<td>I</td>
<td>A Preliminary Examination of Four Phonological Alternations</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>1. Velar : palatal</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>2. Non-sharp consonant : sharp consonant</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>3. e : o</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>4. a : N</td>
<td>23</td>
</tr>
<tr>
<td>II</td>
<td>Examination of the Vowel System</td>
<td>25</td>
</tr>
<tr>
<td>III</td>
<td>The Transformational Cycle: introduction</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>1. The form of the phonological component</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>2. Verb structure</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>3. SIDET' and PISAT'</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>4. KOVAT' and LOVIT'</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>5. LOVIJA and TORGOVLIJA</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>6. KLEVAT' and other verbs in -EVAT' : -JUJUT</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>7. A few general considerations</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>APPENDIX I</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>APPENDIX II</td>
<td>46</td>
</tr>
<tr>
<td>IV</td>
<td>The Treatment of Vowels before $N{#, }$</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>1. Neuter nouns in -JA</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>2. ZVENET' : ZVJAKAT', SEST' : SJADU, and LEC' : LJAGU</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>3. The 3 pl. ending -AT/-JAT</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>4. The form of rule (VN)</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>5. The 1 sg. ending -U/-JU and the 3 pl. ending -UT/-JUT</td>
<td>59</td>
</tr>
</tbody>
</table>
6. Specification of the features compact and flat in vowels before \( \text{N}\{\text{#}\} \) 62
7. Indeterminacy in the representation of \([u]\) 64
8. The suffix -NU- 65
APPENDIX I: the origin of \(a\) after \(P\) (alatalized or palatal consonants) 69
APPENDIX II: the verb -NJAT' 76
APPENDIX III: rules governing consonant truncation/mutation 80

V 86
The \{\text{xR}\} Marker
1. The treatment of consonants before \(\text{x}\) 86
2. The phonology of \(\{\text{o}\}\) LC clusters 91
3. More on (e:o) 99

VI 101
The Phonology of -T diffuse Vowels
1. The basic rules 101
2. Verbs like \(\text{ZRA}T'\) and \(\text{ZVA}T'\) 105
3. Prefixes 106
4. The suffix -EC- 117
5. The suffixes -(E)STV- and -(ISK-) 119
6. Glides 120
7. On the phonology of CurC Circ CulC CulC 123
APPENDIX I 128
APPENDIX II 129
APPENDIX III: prothetic glides 129
APPENDIX IV: marginal notes on glides 132

VII 133
The Phonology of +T Diffuse Vowels
1. Before \(\text{i}\) 133
2. After velars 135
3. In word final position 135

VIII 139
The Transformational Cycle: rule (e:o) 139
1. Rule (\(\emptyset\):E) 140
2. Rule (e:o) 144
3. Rule ($\emptyset$:I)
4. On the internal constituent structure of major constituents

IX More on the Vowel System
1. Diphthongs
2. The shift of o to e

X The Phonology of Velars
1. Rule (BdC)
2. Rule (k:c)
3. The rules for velar phonology
4. Rule (k:č)
5. The sharpness of segments which have undergone (BdC)

XI Non-Transitive and Transitive Softening in the Final Consonants of Noun Stems
1. Non-transitive softening
2. Transitive softening
3. Diminutives in -Ok/-Ei
APPENDIX: on the genitive plural

XII On the Specification of the Feature Voicing in Obstruents

XIII Inventory of Rules and the Relative Order of their Application
1. A re-examination of some of the rules
2. Inventory of rules
3. Relative order of application of the rules

XIV The {iS} Marker

Bibliography
INDEX OF RULES. The rules are given in the order in which they occur in the text. See pp. 209–215 for the final form of the rules and pp. 216–217 for the order in which the rules apply.

<table>
<thead>
<tr>
<th>Rule</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>(k:ɔ)</td>
<td>18, 86, 189, 192</td>
</tr>
<tr>
<td>(c:ɔ,)</td>
<td>21, 184, 206</td>
</tr>
<tr>
<td>(e:o)</td>
<td>22, 145</td>
</tr>
<tr>
<td>(s:ø)</td>
<td>24</td>
</tr>
<tr>
<td>(v:ɔ)</td>
<td>26</td>
</tr>
<tr>
<td>(u:o)</td>
<td>28, 101, 105, 117</td>
</tr>
<tr>
<td>(u:ø)</td>
<td>28, 34, 101</td>
</tr>
<tr>
<td>(Vredund)</td>
<td>31, 208</td>
</tr>
<tr>
<td>(v:j)</td>
<td>35</td>
</tr>
<tr>
<td>(v:ø)</td>
<td>35, 204-205</td>
</tr>
<tr>
<td>(u:v)</td>
<td>37</td>
</tr>
<tr>
<td>(u:w)</td>
<td>37, 38, 121</td>
</tr>
<tr>
<td>*(u:w)</td>
<td>39</td>
</tr>
<tr>
<td>*(v:i)</td>
<td>40</td>
</tr>
<tr>
<td>(VN)</td>
<td>49, 53, 63</td>
</tr>
<tr>
<td>(N:ø)</td>
<td>50</td>
</tr>
<tr>
<td>(v:o)</td>
<td>59</td>
</tr>
<tr>
<td>(v:0-exo)</td>
<td>59</td>
</tr>
<tr>
<td>(e:ø)</td>
<td>69</td>
</tr>
<tr>
<td>(d1:l)</td>
<td>82</td>
</tr>
<tr>
<td>(l:ø)</td>
<td>82</td>
</tr>
<tr>
<td>(kt:k)</td>
<td>84, 176</td>
</tr>
<tr>
<td>(c:s)</td>
<td>84, 207-208</td>
</tr>
<tr>
<td>(s:ɔ)</td>
<td>85</td>
</tr>
<tr>
<td>(t:ɛ)</td>
<td>86, 177</td>
</tr>
<tr>
<td>(j:1)</td>
<td>87</td>
</tr>
<tr>
<td>(j:ø)</td>
<td>89</td>
</tr>
<tr>
<td>(v:vv)</td>
<td>92, 98, 124</td>
</tr>
<tr>
<td>(v:vv)</td>
<td>92</td>
</tr>
<tr>
<td>(vl:iv)</td>
<td>92, 124</td>
</tr>
<tr>
<td>(el:ol)</td>
<td>94</td>
</tr>
<tr>
<td>(d:ø)</td>
<td>101</td>
</tr>
<tr>
<td>(o:epenth)</td>
<td>115-116</td>
</tr>
<tr>
<td>*(u:w-exo)</td>
<td>122, 207</td>
</tr>
<tr>
<td>(exo)</td>
<td>122</td>
</tr>
<tr>
<td>(u:o-exo)</td>
<td>125</td>
</tr>
<tr>
<td>(r: r)</td>
<td>125</td>
</tr>
<tr>
<td>(el:ol)</td>
<td>126</td>
</tr>
<tr>
<td>(#1: #1)</td>
<td>130</td>
</tr>
<tr>
<td>(ø:j)</td>
<td>130</td>
</tr>
<tr>
<td>(ø:j/w)</td>
<td>130</td>
</tr>
<tr>
<td>(jo:o)</td>
<td>132</td>
</tr>
<tr>
<td>(u:u)</td>
<td>133</td>
</tr>
<tr>
<td>(u:i)</td>
<td>135</td>
</tr>
<tr>
<td>(i#: i#)</td>
<td>136</td>
</tr>
<tr>
<td>(ø:e)</td>
<td>141</td>
</tr>
<tr>
<td>(φ:E)</td>
<td>142</td>
</tr>
<tr>
<td>(e:o-exo)</td>
<td>145</td>
</tr>
<tr>
<td>(φ:I)</td>
<td>155</td>
</tr>
<tr>
<td>(νν:ν)ₜ</td>
<td>161</td>
</tr>
<tr>
<td>(o1:e)</td>
<td>163</td>
</tr>
<tr>
<td>(o:e)</td>
<td>165, 187</td>
</tr>
<tr>
<td>(βδο)</td>
<td>169, 176, 177</td>
</tr>
<tr>
<td>(š:ũ)</td>
<td>172</td>
</tr>
<tr>
<td>(C:φ)</td>
<td>173</td>
</tr>
<tr>
<td>(k:c)</td>
<td>174</td>
</tr>
</tbody>
</table>

We give an analysis of the phonological component of Modern Standard Russian. Any analysis of this kind will, to a certain degree, be artificial because the grammar of a language is an integrated whole; analysis of one part of the grammar without reference to the other parts will inevitably result in false claims and oversights. On the other hand, an analysis of the type presented here will make certain requirements which the syntactic and semantic components of the grammar must meet. If the syntactic and semantic components can meet these requirements in a natural way, this will give confirmation for the correctness of the phonological component presented here.

We shall not include an analysis of stress or intonation, because of the difficulty of the subject matter and because of its inherent dependence on syntactic analysis. In the derivations of phonetic representations, we mark main word stress with an acute accent and give no discussion of how this stress is to be assigned. A proposed study of this problem is in progress and is to appear under the joint authorship of Wayles Browne, Morris Halle, and myself.

2. On Syntax, Morphology, and Phonology.

Arguments for abandoning the traditional division of grammar into three distinct components (called syntax, morphology, phonology) have been given in a number of publications,
and, to my knowledge, have never successfully been refuted.¹ We shall not, therefore, dwell on this question; we mention here only a single facet of the problem, namely, the much-discussed velar : palatal alternation in Russian.

Trubetzkoy ("Sur la morphonologie") draws a sharp distinction between the \( k \times : k\) alternation in RUKA : RUČNOJ 'arm, hand', UXO : USNOJ 'ear' and the \( k \times : k_{1} \times \) alternation in RUKA : RUKI, UXO : UXE. For the latter he says (p. 184) that "ces deux sons ne sont que deux réalisations phonétiques d'un seul et même phonème, le choix de l'une ou de l'autre dépendant exclusivement de circonstances phonétiques extérieures: devant le phonème \(<a>\), le phonème \(<\kappa>\) se réalise toujours comme postpalatal, devant le phonème \(<i>\), il se réalise toujours comme occlusive sourde palatale; la morphologie n'a rien à voir ici," whereas for the velar : palatal alternation he says "Il en va tout autrement du rapport entre \( k \) et \( ç \) dans le cas рука : ручной. D'abord, \( k \) et \( ç \) sont deux phonèmes qui peuvent figurer dans des positions phonétiques identiques, en créant par leur différence une différence de sens (par ex. кума : чума, кот : чот). L'un et l'autre phonèmes peuvent figurer et devant \(<\alpha>\) (par ex. каша : чаша) et devant \(<\kappa>\) (на кнут : начнут). Aussi

l'alternance de ces deux phonèmes que l'on observe dans le cas 
рука : ручной n'est-elle pas due à un agencement phonétique, 
mais à la structure morphologique du mot, – fait d'un tout 
autre ordre que l'alternance d'explosive postpalatale et d'oc- 
clusive palatale observée dans le cas рука : руки."

Trubetzkoy's approach, typical of the traditional ap-
proach, is to show that Ḟ x are phonemically distinct from Ḗ x 
by giving pairs of words which show Ḟ x and Ḗ x in identical 
phonetic environments but which differ in meaning. In order to 
explain the obvious relation between RUKA and RUČNOJ, UXO and 
USNOJ, Trubetzkoy proposes a phonological representation dis-
tinct from the phonemic representation and requires application 
of a set of rules which derive phonemic representation by taking 
advantage of morphological categories.²

A.N. Gvozdev, using Trubetzkoy's approach, has recently 
proposed the following rule to account for the velar : palatal 
alternation ("Rol' istoričeskix čeredovanij v sovremennom russkom 
jazyke," p. 254):

2 The exact representation of RUKA, RUČNOJ which Trubetz-
koj proposes is not relevant to this discussion. The relevant 
issue is Trubetzkoy's requirement that the Ḟ : Ḗ alternation in 
RUKA : RUČNOJ be described at a level of representation distinct 
from the level of representation in which the Ḟ : Ḗ alternation 
is RUKA : RUKI is described.
Without troubling to note all the environments Gvozdev has failed to list in which velars alternate with palatals, and without troubling to enquire into the reality of Gvozdev’s poss. adj. ɨ (VRAŽIJ [vrážyj] or [vrážej]), we will simply observe that Gvozdev’s (or, one might say, Trubetzkoy’s) rule fails to make explicit the fact that velars alternate with the corresponding strident palatals before front vowels (RUKA : RUČIŠĆA, RUČIŠKA etc.), and that any description formulated within Trubetzkoy’s framework may not take advantage of this fact because it relies on purely phonological phenomena.

3 It is true that velars occur before the front vowel ɨ (GIBNUT’, XITRYJ, KINUT’ etc.), but velars do not occur before ɨ; the phonetic clusters [k,i], [g,i], and [x,i] may, there-
A.A. Reformskij ("O sootnošenii fonetiki i grammatiki") has rejected, in part, the notion of the three distinct levels of representation proposed by Trubetzkoy, but has raised a problem which, to my knowledge, has not previously been discussed: the κхи : খষ alternations in forms like DIKIJ 'wild' : DIČ 'wilderness', GLUXOJ 'out-of-the-way, remote' : GLUS 'remote corner, out-of-the-way place'. Reformatskij requires that the morpheme in such pairs be considered the same, but that the alternation be accounted for in a manner distinct from the way in which the κхи : খষ alternation in RUKA : RUČNOJ, UXO : USNOJ is accounted for. In short, Reformatskij, while rejecting Trubetzkoy's extremely narrow division of grammar into phonology and morphology, has merely widened the scope of phonology; the division still stands.

We can no more accept Reformatskij's proposal than Trubetzkoy's. Although the motivation for the velar : palatal alternation is different in RUKA : RUČNOJ and DIKIJ : DIČ', the alternation itself is the same; were we to relegate the RUKA : RUČNOJ alternation to one part of the grammar and the DIKIJ : DIČ' alternation to a different part of the grammar, we would be obliged to state the same rule twice.

Therefore, be represented as κΫ, κΫ, and κΫ. Velars before front vowels may be replaced by the corresponding strident palatals, and then grave ϒ after a velar shifted front to i.

⁴See Halle, "Phonemics" for discussion of Reformatskij's position.
Let us return to Trubetzkoy's discussion, in which he mentions an (apparently still different) velar: palatal alternation (p. 184): "dans toutes les langues slaves contemporaines, les morphonèmes к : ancock et CharArray not admitted as elements finals of morphèmes: en russe, dans les cas du type рука: ручной ou ухо: ушной, les alternances к : ancock et CharArray n'affectent pas l'unité des morphèmes, alors que dans les cas comme коса: чесать ou ходить: шедший, les mêmes alternances к : ancock et CharArray rendent impossible toute conscience d'une unité des morphèmes (en dépit du fait que, dans des cas analogues, comme везет ou водить: ведший, l'alternance ы : ы' n'empêche nullement la conscience de l'unité des morphèmes)."

The key word in this sentence is "conscience," for unless we know what is meant by "conscience" it is impossible to know what claim is being made. If "conscience" is to mean "consciousness" or "performance," then Trubetzkoy's claim is undoubtedly true: the alternations к х : ancock in KOSA 'plait, tress, braid', XODIT' 'to go' : CESAT' 'to comb', SEDSTIJI 'having gone' probably do render all consciousness of the unity of the morphemes impossible. With this interpretation of "conscience," however, the sentence loses its interest; it is well known that people are not consciously aware of relationships which exist among forms of their language. If, on the other hand, Trubetzkoy means "innate ability" or "competence," then the claim is false. 6

5For discussion of the notion "competence" as opposed to "performance," see Chomsky, "Formal Discussion."
6Thus, as Trubetzkoy observes, the forms VODIT' and
The bold statement such and such forms are not related in an abstract representation of the linguistic competence of native speakers is insufficient; one must prove whether the forms are or are not related. The problem is that of the black box; "insofar as independent neurophysiological evidence is not available," Chomsky points out ("Review of Verbal Behavior by B.F. Skinner"), "it is obvious that inferences concerning the structure of the organism are [must be] based on observation of behavior and outside events."

VEDSIJ are derived from a single lexical morpheme. An e : o ablaut rule is thus required to account for the determined (D) vs non-determined (ND) aspectual pairs of "motion" verbs: VESTI : VODIT' 'to lead', NESTI : NOSIT' 'to carry', VEZTI : VOZIT' 'to convey, cart'; in order to show the relation between XODIT' and ŠEDSIJ, we require only that the e : o ablaut rule apply earlier than the rule which replaces velars before front vowels by the corresponding strident palatals, rule (k:Č). Thus we will have derivations of the following type:

VESTI: D(ved)D → e:o→ inapplicable

VODIT': ND(ved)ND → e:o→ ND(vod)ND

SEDŠIJ: D(xed)D → e:o→ inapplicable → k:Č→ D(šed)D

XODIT': ND(xed)ND → e:o→ ND(xod)ND → k:Č→ inapplicable

The underlying relationship between KOSA and ČESAT' is less clear.

There is one type of nominalization in Russian which requires the shift of the base vowel to o; thus VYBOR 'choice' (cf. VYBIRAT'/VYBRAT' 'to choose'), RAZDOR 'discord, dissention' (cf. RAZDIRAT'/RAZODRAT' 'to tear, rend, lacerate'), ZAPOJ 'hard drinking' (cf. ZAPIT'/ZAPIVAT' 'to take to drinking'), VYZOV 'call, challenge' (cf. VYZIVAT'/VYZVAT' 'to call, challenge'), NADZOR 'supervision' (cf. NADZIRAT' 'to supervise'), MOROZ 'frost' (cf. MERZNUT' 'to freeze') etc. It can be seen that the rule which accounts for this vowel change, like the e : o ablaut rule for motion verbs, is perfectly general and must be contained within a descriptively adequate grammar of Modern Russian. On the other hand, the u : o alternation found in pairs like GLUXOJ 'deaf' : GLOXNUT' 'to become/grow deaf', SUXOJ 'dry' : SOXNUT' 'to become/grow dry' etc. are analogous to the e : o alternation in KOSA : CESAT'. The exact nature of these ablaut rules is not clear to us. The relationship between the u in SUXOJ, GLUXOJ and the o in the derived verbs SOXNUT', GLOXNUT' is superficially quite clear, but it is not clear whether this u : o alternation is isolated or whether it should be related to other vowel alternations. In the text (pp. 54-56) we shall give several examples like CESAT' : KOSA, so that there can be little doubt that the e : o rule has wider application than to motion verbs. We do not know whether this e : o alternation is restricted to a few isolated roots, or whether some more general statement of the alternations is possible.

In the thesis, then, we shall not treat vowel changes
which are motivated by processes of derivational morphology. Nor shall we discuss isolated consonant alternations like the
\( t : k \) alternation found in PUSTIT' : PUSKAT' 'to let go (pf. : impf.)', ŽEĽTYJ 'yellow' : ŽEĽKNUT' 'to grow yellow' etc.

4. On the Nature of the Description.

Our description is formulated within the framework of generative phonology\(^7\) and is purely synchronic. The underlying forms which we propose bear some resemblance to underlying forms which would be set up for Proto-Slavic, and the rules we require often reflect the historical development from Proto-Slavic to present-day Russian. The question of the relationship of the proposed description to earlier forms of the language is a question of diachronic linguistics and is not relevant to the present investigation.\(^8\) For this reason we make no further reference to the relationship between our description and a description of any earlier stage of Russian.


\(^8\)For discussion of this question, see my "Phonology of Old Church Slavonic Conjugation," "O cikličeskix pravilax v russkom sprjaženii," and Halle and Lightner, "Relative Chronology and the Synchronous Order of Rules."
I am indebted to Noam Chomsky, whose deep insight and understanding of the nature of language forms the basis of whatever insight and understanding I might have. I would like to thank Morris Halle, with whom I have spent many hours discussing Slavic phonology and whose ideas can be found on every page of this thesis. Also I would like to express my thanks to Jerzy Kuryłowicz, who read the entire first draft of the thesis and who made numerous helpful comments and criticisms. Finally, I would like to thank Wayles Browne, Yuki Kuroda, Jim McCawley, Hugh Matthews, and Paul Kiparsky, all of whom have helped me to formulate the analysis of Russian given here.
I. A PRELIMINARY EXAMINATION OF FOUR PHONOLOGICAL ALTERNATIONS.

1. We give below a few examples of velar: palatal alternations in Russian (cf. p. 11):

   (i) Velar in 1 sg.: palatal in 3 sg.: PEKU 'I bake' : PEČET 'bakes', MOGU 'I am able' : MOŽET 'is able'.

   (ii) Velar in inf.: palatal in pres.: PLAKAT' 'to weep' : PLACET 'weeps', DVIGAT' 'to move' : DVIGU 'I move', MA-XAT' 'to wave' : MAŠU 'I wave'.


   (iv) Velar in noun: palatal in verb: DRUG : DRUŽIT' 'to be friends (with)', GREX 'sin' : GRESIT' 'to sin', MUKA 'torment' : MUCIT' 'to torment'.


We will account for velar: palatal alternations by deriving the forms in question from a representation containing an underlying velar. These base forms will undergo application of the following rule:

\[ (k:č) \quad [+\text{obstruent}] \quad \rightarrow \quad [+\text{strident}] \quad / \quad \quad [-\text{cons}] \]
Application of this rule replaces velars before front vowels or ĭ by the corresponding strident palatals. The forms given above, for example, might be derived from the following underlying representations:

<table>
<thead>
<tr>
<th>forms with a phonetic velar</th>
<th>forms with a phonetic palatal</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEKU</td>
<td>PEČET</td>
</tr>
<tr>
<td>MOGU</td>
<td>MOŽET</td>
</tr>
<tr>
<td>PLAKAT'</td>
<td>PLAČU</td>
</tr>
<tr>
<td>DVIGAT'</td>
<td>DVIŽU</td>
</tr>
<tr>
<td>MAXAT'</td>
<td>MAŠU</td>
</tr>
<tr>
<td>DRUG</td>
<td>DRUŽEN</td>
</tr>
<tr>
<td>VEK</td>
<td>VECEN</td>
</tr>
<tr>
<td>USPEX</td>
<td>USPEŠEN</td>
</tr>
<tr>
<td>DRUG</td>
<td>DRUŽIT'</td>
</tr>
<tr>
<td>GREX</td>
<td>GRESIT'</td>
</tr>
<tr>
<td>MUKA</td>
<td>MUČIT'</td>
</tr>
<tr>
<td>BOG</td>
<td>BOŽIJ</td>
</tr>
<tr>
<td>VOLK</td>
<td>VOLČIJ</td>
</tr>
<tr>
<td>ČEREPAXA</td>
<td>ČEREPASIJ</td>
</tr>
</tbody>
</table>

The velar in each form in the right hand column lies before a front vowel or ĭ and is consequently replaced on application of rule (k:č) by the corresponding strident palatal (k → č; ĝ → ž; x → ĺ). We will require application of a later rule (given on p. 178) to make ž continuant.
2. We consider next a few examples of non-sharp consonant : sharp consonant alternation:

(i) Non-sharp C in nom. sg.: sharp C in loc. sg.: STOL: STOLE 'table', VODA: VODE 'water', MESTO: MESTE 'place'.

(ii) Non-sharp C in 1 sg.: sharp C in 3 sg.: NESU 'I carry': NESET 'carries', VEDU 'I lead': VEDET 'leads', PRYGGNU 'I jump': PRYGNET 'jumps'.

(iii) Non-sharp C in noun: sharp C in adjective (masc. short form): VKUS 'taste': VKUSEN 'tasty', UM 'mind, intellect': UMEN 'wise', SILA 'strength': SILEN 'strong', GOLOD 'hunger': GOLODEN 'hungry'.

(iv) Non-sharp C in noun: sharp C in verb: BOMBA 'bomb': BOMBIT 'to bomb', OTVET 'answer': OTVETIT 'to answer', DAR 'gift': DARIT 'to give'.

(v) Non-sharp l in masc. past: sharp l, in pl. past: OTVETIL 'he answered': OTVETILI 'they answered', NAPISAL 'he wrote': NAPISALI 'they wrote', KURIL 'he was smoking': KURILI 'they were smoking'.

Sharpening of consonants will be accounted for by requiring that all consonants in underlying representations be (redundantly) specified non-sharp, and that each consonant in a consonant cluster be marked sharp if that cluster lies before a front vowel or j:
(C:C,) \( C_1 \rightarrow [+\text{sharp}] / [-cons \text{-grave}] \)

where \( C_1 \) represents one or more consonants

Thus we might posit the following representations for the forms given above: STOL - stol; STOLE - stol+e; MESTO - mest+o; MESTE - mest+e; SILA - sil+a; SILEN - sil+en; KURIL - kur+i+1; KURILI - kur+i+1+1 etc.

Application of \((C:C,)\) will correctly predict sharpening of all consonants in the representations given immediately above and also of all consonants in the representations given on page 19, except for the palatals \( ĺ \) ĺ. Thus, mest+e \(-\rightarrow\) C:C, m,es,t,+e; pek+e+t \(-\rightarrow\) peč+e+t \(-\rightarrow\) C:C, p,ec,+e+t; but, grex+ı+t, \(-\rightarrow\) greš+ı+t, \(-\rightarrow\) C:C, *(g,r,es)+ı+t. We will account for the non-sharp quality of the palatals \( ĺ \) ĺ (\( ĺ \)) by application of a later rule given on page 178. On pages 93-96 we will show that \( (k:\check{c}) \) must apply before \((C:C,)\).

3. The following forms show an e : o alternation:

ČERTI : ČORT 'devils : devil'
PER'JA : PERYŠKO 'plumes : plumelet'
VESEL'E : VESELYJ 'merriment : merry'
PROČEST' : PROČEL 'to read : he read'
GREZIT' : GREZA 'to (day-)dream : (day-)dream'
ZEMLJU : ČERNOZEM 'earth (acc. sg.) : black earth'
BEREZNIK : BEREZA 'dense birch forest : birch'
PESIJ : PES 'of dog : dog'
PETJA : PETR 'Pete : Peter'
SESTRIN : SESTRY 'of sister : sisters (nom. pl.)'
DEŠEVLE : DEŠEVIJ 'cheaper : cheap'
SEL'SKIJ : SELA 'rural : villages (nom. pl.)'
ČERN' : ČERNYJ 'niello : black'
DVOEZENEC : DVOEŽENSTVO 'bigamist : bigamy'
PLET' :PLETKA 'whip : small, short whip'
KOLESNIK : KOLESÁ 'wheel-wright : wheels (nom. pl.)'
DALEČE : DALEK 'farther : far (masc. short)'

In all the above forms, ţ occurs before a non-sharp consonant, whereas ď occurs before a sharp consonant. We account for this alternation by application of the following rule, which must apply after rule (C:C),:

\[(e:o) \quad e \rightarrow o \quad / \quad \underline{---} \quad [-\text{sharp}]\]

Thus, for example, PES: pěs \(\rightarrow\) C:C, \(\rightarrow\) p,ěs \(-e:o-\) p,ćs;
SESTRY: sěstr+y \(\rightarrow\) C:C, \(\rightarrow\) s,ěstr+y \(-e:o-\) s,ŏstr+y; but PESIJK:
pěš+i:j \(\rightarrow\) C:C, \(\rightarrow\) p,ěs+i:j; SESTRIN: sěstr+in \(\rightarrow\) C:C, \(\rightarrow\) s,ěs,t,r,+in.
Rule \((e:o)\) is inapplicable to the representations of the last two forms (PESIJK and SESTRIN) because the segment following the ď is sharp. Note that some segments of the forms given on pages 19-21 also undergo application of rule \((e:o)\):

PECET: pek+ě:t \(\rightarrow\) k:č \(\rightarrow\) peč+ě:t \(\rightarrow\) C:C, \(\rightarrow\) p,ěč,+ě:t
\(-e:o-\) p,ěč,+č+t
4. The following forms show an a : N alternation:

NAČAT' : NAČNET 'to begin : begins'
ŽAT' : ŽMET 'to squeeze : squeezes'
ŽAT' : ŽNET 'to reap : reaps'
MJAT' : MNET 'to crumble : crumples'
RASPJAT' : RASPNET 'to crucify : crucifies'
PAMJAT' : POMNIT' 'memory : to remember'

In considering these forms, we observe that the consonant preceding the a which alternates with N is either palatal ([Žát,] 'to squeeze; to reap') or sharp ([mžát,] 'to crumble'). Furthermore, we note that the derived imperfectives (henceforth abbreviated DI) of these verbs show the cluster iN: NAČINAT' 'to begin'; RAZŽIMAT' 'to unclench'; DOŽİNAT' 'to finish reaping'; OBMINAT' 'to trample down'; RASPINAT' 'to crucify'; POMNINAT' 'to remember'. These observations suggest that the underlying forms of these roots contain the cluster XN, where X represents a front vowel which drops in pres. tense forms, and which appears as a in past tense forms, i in DI's. We note also that the distinguishing phonological difference between past and present tense suffixes is that the former begin with consonants, the latter with vowels. We can postulate, therefore, the following three rules, leaving the exact nature of the front vowel X unspecified for the moment:
(1) \[
\begin{array}{c}
1 \\
\hline
\text{N}_\text{DI}
\end{array}
\]

(2) \[
\begin{array}{c}
a \\
\hline
\text{NC}
\end{array}
\]

(3) \[
\phi \text{ elsewhere} \quad [\phi \text{ represents "zero"}]
\]

A few derivations:

\text{NAČINAT}: \quad \begin{align*}
\text{na#kXn+āj+t,} & \quad \rightarrow_{c,\text{-}} \quad \text{na#kXn+āj+t,} \\
-\text{C}:\text{C}, & \rightarrow \quad (\text{na#kXn+āj+t,})_{\text{DI}} \\
-\text{1} & \rightarrow \quad (\text{na#kXn+āj+t,})_{\text{DI}}
\end{align*}

\text{NAČAT}: \quad \begin{align*}
\text{na#kXn+t,} & \quad \rightarrow_{c,\text{-}} \quad \text{na#kXn+t,} \\
\text{na#kXn+t,} & \quad \rightarrow_{c,\text{-}} \quad \text{na#kXn+t,}
\end{align*}

\text{NAČNET}: \quad \begin{align*}
\text{na#kXn+ē+t} & \quad \rightarrow_{c,\text{-}} \quad \text{na#kXn+ē+t} \\
\text{na#kXn,} & \quad \rightarrow_{c,\text{-}} \quad \text{na#kXn,}
\end{align*}

\text{In the derivations of NAČINAT'} and NAČAT' we shall drop the ē and n respectively by application of a rule which drops non-vocalic sonorants (S) before consonants:}^1

\[
(S:\phi) \quad \begin{array}{c}
-\text{obstruent} \\
-\text{vocalic}
\end{array} \rightarrow \quad \phi \quad \begin{array}{c}
+\text{cons}
\end{array}
\]

\text{NAČINAT':} \quad \begin{align*}
\text{na#kXn+āj+t,} & \quad \rightarrow_{c,\text{-}} \quad \text{na#kXn+āj+t,}
\end{align*}

\text{NAČAT':} \quad \begin{align*}
\text{na#k,} & \quad \rightarrow_{c,\text{-}} \quad \text{na#k,}
\end{align*}

---

1This rule was first suggested by Roman Jakobson, "Russian Conjugation," section 2.221, p. 159.
II. EXAMINATION OF THE VOWEL SYSTEM.

Acceptance of the proposals made in Chapter I raises several problems related to the correct underlying representation of vowels. In the first place, we note that the representations of forms like VEK, GREX, MESTO, OTVET etc. must not undergo application of (e:о):

VEK: věk → o;о,→ v,ěk → e:о→ *v,čk

In the second place, we note that the root vowel of PES 'dog', but not of, say, TES 'boards, thin planks', drops in oblique cases: PES, PSA, PSU etc., but TES, TESA, TESU etc.

In the third place, we must specify precisely the nature of the vowel X, posited in I.4 (pp. 23-24).

Let us consider first the vowel X. If we observe other derived imperfectives, we can see that a vowel shift is the general rule, at least with certain imperfectivizing suffixes:

\[ \emptyset \rightarrow \varepsilon \]

ZAMOROZIT' : ZAMORAŽIVAT' 'to freeze'
ZAKONČIT' : ZAKANČIVAT' 'to complete'
OPOROŽNIT' : OPORAŽNIVAT' 'to empty'

\[ \emptyset \rightarrow 1 \]

UBRAT' : UBIRAT' 'to take away'
ZADRAT' : ZADIRAT' 'to pull up; break, split'
VYŽDAT' : VYŽIDAT' 'to wait for'

\[ \emptyset \rightarrow \varepsilon \]

NAZVAT' : NAZYVAT' 'to call'
OBOLGAT' : OBLYGAT' 'to slander'
ZAMKNUT' : ZAMYKAT' 'to lock'
On fn. 1, p. 26: possibly o → a in DI's if
the verb is a denominal: обезбожить < божа; озабочить < забоja; проречить < спор о "этом слово" is then structurally ambiguous: either a primary verb or a denominal from слово
In some, but not all, of the verbs of the last two groups, the perfective future shows a vowel: UBRAT': UBERU; ZADRAT': ZADERU; NAZVAT': NAZOVIU; but VYUDAT': VYDU; OBO-
LGAT': OBOLOGU.

We suggest that these facts be accounted for by requiring a distinctive opposition +T vs -T in the basic vowel system, where T represents an abstract feature which does not appear in phonetic representations. Vowels will be specified +T in DI's, and -T vowels will drop out under certain conditions, will lower to o o under other conditions. Rule (1) of page 24 may now be revised as follows:

(V: \bar{V}) \quad V \rightarrow [ +T ] \quad \text{in certain DI's}^1

The base vowels o and a are thus non-diffuse and grave, o -T and a +T. The redundant features of flatness and compactness will be specified by application of rules which apply after

---

^1We will not consider in detail the process of imperfectivization; we note here that o / a in a fairly large group of DI's: OBEZVODIT': OBEZVOZIVAT' 'to dehydrate'; OZABOTIT': OZABOCIVAT' 'to cause anxiety'; PROSROČIT': PROSROČIVAT' 'to exceed the time limit' etc. A few DI's have doublets: OBUSLOVIT': OBUSLAVLIVAT' and OBUSLOVLIVAT' 'to stipulate'. DI's in stressed -JÁT' do not show orthographic o - a, but this is irrelevant to the formulation of rule (V: \bar{V}) because pretonic o is pronounced [a]: OZIOBIT': OZIOBLJÁT' [azlabl,ájt] 'to embitter'.
(V: V) (see p. 31). In the abbreviations for the distinctive feature matrices which represent basic vowels we use a macron to indicate the specification +T; thus the +T vowel underlying a is abbreviated ă, whereas the abbreviation for the -T vowel o is ă.

For the pair ZAMOROZIT': ZAMORAŽIVAT', then, we have (ză#morăž+z+ı+t,)PF : (ză#morăž+z+ıv+ı+j+t,)DI. Only the last form undergoes application of (V: V) to give (ză#morăž+z+ıv+ı+j+t,)DI. On page 70 we will show how the final root consonant of these DI's undergoes transitive softening; in the case of ZAMORAŽIVAT' transitive softening of ă results in ă. Rule (S: φ) will drop ı from the verb suffix to give (ză#morăž+z+ıv+ı+j+t,)DI (ultimately [zemarăžyvet,]).

The underlying root in forms like UBRAT', UBERU, UBITAT' will contain the -T vowel ı. This vowel will shift to +T ı in the DI (by application of (V: V)), will be lowered to e in perceptive future forms, and dropped out in perceptive past forms.

The root vowel X in NAČAT', ĆAT', MJAT' etc. may be considered -T ı, rule (2) of page 24 replaced by

\[(2') \; ı \rightarrow ă / \text{N C}\]

and rule (3) by the (as yet unformulated) rule which drops +T ı's in certain positions.

In the forms NAŽVAT', NAZOVET, NAŽYVAT', we can postulate a -T root vowel u, and the derivations of these forms will then
parallel the derivations of UBRAT', UBERET, UBIRAT'. We will specify $u \acute{a}$ as -T diffuse vowels, $u$ grave, $\acute{a}$ acute. The +T diffuse vowels $\ddot{u} \ddot{a}$ will underlie the phones $\acute{u}$ and $\ddot{a}$ respectively.\footnote{It will be seen that the phone $[u]$ must be derived from an underlying representation different from either $u$ or $\ddot{u}$. We shall show later (in III and IV) which segments underlie this phone.}

If we return now to the problem of PES, PSA vs TES, TE-SA, we can see that if pis is postulated as the root of PES, we can generalize the rules which drop and lower -T $\acute{a}$. These generalized rules will have to lower $\acute{a}$ in the nom. sg. and drop $\acute{a}$ in all other case forms; that is, $\acute{a}$ will be lowered before the (phonetically) zero ending of the nom. sg., dropped before the non-zero endings of the other cases. Parallel to PES, PSA and TES, TESA are nouns with back vowels like ROT, RTA 'mouth' and POT, POTA 'sweat'. In IV.4.1 we shall give evidence to show that the phonetic zero ending should be considered not $\emptyset$, but -T $u$. The requirement that the root vowel $u \acute{a}$ be lowered in nom. sg. and dropped elsewhere may thus be stated as follows:

\[(u:o) \quad [u,\acute{a}] \rightarrow [-\text{diffuse}] \quad / \quad C_1 [u,\acute{a}] \]

\[(u:o) \quad [u,\acute{a}] \rightarrow \emptyset \]

If these rules apply before (e:o), we will have the following derivations:
- 29 -

PES: pis+u →C:C,→ p,is+u →u:o→ p,es+u →u:∅→ p,es →e:o→ p,os
PSA: pis+∅ →C:C,→ p,is+∅ →u:∅→ p,s+∅

ROT: rut+u →u:o→ rot+u →u:∅→ rot
RTA: rut+∅ →u:∅→ rt+∅

TES(A): tes(+∅) →C:C,→ t,es(+∅) →e:o→ t,os(+∅)
POT(A): pot(+∅) [no rules apply]

The adjectives mentioned on page 20 (VKUSEN, UMEN, SI-LEN, GOLODEN) are formed with the help of the suffix in:

masc. SILEN: sîl+in+u →C:C,→ s,îl,+in+u →u:o→ s,îl,+en+u →u:∅→ s,îl,+en →e:o→ s,îl,+en

fem. SÎL'NA: sîl+in+∅ →C:C,→ s,îl,+in+∅ →u:o→ inapplic-able →u:∅→ s,îl,+n+∅

If a velar precedes this suffix, it shifts to the corresponding strident palatal by application of (k:∅): MRAČEN, MRAČNA 'gloomy' (cf. MRAK 'gloom', where the velar remains intact).

MRAČEN: mrokr+in+u →k:∅→ mroč+in+u →C:C,→ mroč,+in+u →u:o→ mroč,+en+u →u:∅→ mroč,+en →e:o→ mroč,+on

Rule (u:∅) can be seen to be the formalization of rule (3) on page 24, and the derivations given on page 24 are now as follows:
NAČINAT': \((nō\#k1n+ōj+t)_D1\) \(\rightarrow k:ę\) \((nō\#čš1n+ōj+t)_D1\)
\(\rightarrow C:C,\rightarrow\) \((nō\#č,Š1n+ōj+t)_D1\) \(\rightarrow V:V\rightarrow\) \((nō\#č,Š1n+ōj+t)\)
\(\rightarrow 2', (u:o), (u:ø)\rightarrow inapplicable\) \(\rightarrow S:ø\rightarrow\)
\((nō\#č,Š1n+ō+t)\)

NAČAT': \(nō\#k1n+t\), \(\rightarrow k:ę\rightarrow nō\#čš1n+t, \rightarrow C:C,\rightarrow\)
\(nō\#č,Š1n+t, \rightarrow 2'\rightarrow nō\#č,Š1n+t, \rightarrow (u:o), (u:ø)\rightarrow in-
 applicable\) \(\rightarrow S:ø\rightarrow nō\#č,Š1+t,\)

NAČET: \(nō\#k1n+e+t\) \(\rightarrow k:ę\rightarrow nō\#čš1n+e+t \rightarrow C:C,\rightarrow\)
\(nō\#č,Š1n+e+t \rightarrow u:o\rightarrow inapplicable\) \(\rightarrow u:ø\rightarrow nō\#č,Š1n+e+t\)
\(\rightarrow e:o\rightarrow nō\#č,Š1n,+e+t\)

The feature T distinguishes the root vowel in forms like VEK, GREX etc. vs TES, MED (gen. sg. MEDA) 'honey' etc.:

VEK: \(vēk \rightarrow C:C,\rightarrow \ v,ēk \rightarrow e:o\rightarrow inapplicable\)

The +T vowel ę also underlies the prep. sg. ending of nouns (GREXE, PSE etc., and not *GREXE, *PSE etc.). Rule (k:ę) does not apply in prep. sg. of velar stems (RUKE, GREXE etc., and not *RUČE, *GREŠE etc.), and in IX.1 we shall show that the non-application of (k:ę) in these forms may be explained by postulating a deeper representation of this ending at the time of application of rule (k:ę).

The following table shows the vowel system we have suggested in this chapter:
symbol: u ı o e

diffuse:  +  +  -  -  
grave:  +  -  +  -  

TABLE I. Basic Vowel Segments of Russian (each vowel in two variants, one specified +T, and one -T).

Application of the following rules will assign values to the as yet unspecified, redundant features of compactness and flatness for the vowel segments shown in TABLE I:

(Vredund-a)   \(X \rightarrow [-\text{flat}]\)

(Vredund-b) \([+\text{grave}_{-T}] \rightarrow [+\text{flat}]\) / \[[+\text{vocal}][-\text{cons}]\]

(Vredund-c) \([\text{diff}] \rightarrow [-\text{comp}]\)

Application of (Vredund) to the matrices shown in TABLE I produces the matrices shown in TABLE II below:

segment: \(\ddot{u} \; \dddot{I} \; \dddot{o} \; \ddot{e} \; u \; i \; o \; e\)
tense: \(+ \; + \; + \; + \; - \; - \; - \; -\)
diffuse: \(+ \; + \; - \; - \; + \; + \; - \; -\)
grave: \(+ \; - \; + \; - \; + \; - \; + \; -\)
compact: \(- \; - \; + \; + \; - \; - \; + \; +\)
flat: \(- \; - \; - \; - \; + \; - \; + \; -\)

TABLE II. More Fully Specified Vowel Segments of Russian.
After the application of (Vredund) we shall use a different set of abbreviations for the vowel segments: \( \ddot{V} \) for \( \ddot{u} \), \( \ddot{I} \) for \( \ddot{i} \), \( \ddot{A} \) for \( \ddot{o} \), \( \ddot{E} \) for \( \ddot{e} \), \( U \) for \( u \), \( i \) for \( \ddot{i} \), \( o \) for \( \ddot{o} \), \( e \) for \( \ddot{e} \).
III. THE TRANSFORMATIONAL CYCLE: introduction.

1. The Form of the Phonological Component.

The phonological component consists of a set of partially ordered rules which apply within the framework of a transformational cycle.\(^1\) For purposes of explication we reconsider the derivations of ROT, RTA given on page 29 above. Simplex nouns have the following structure (NS for noun stem):

\[
#_N(\text{NS ROOT + NOUN SUFFIX})_{NS + ENDING})_N #
\]

In what follows, we shall omit real word boundaries, and shall not label constituents (except, of course, where some ambiguity might arise). The derivation of gen. sg. RTA, from \((\text{rut}+\text{a})\), is as follows:

FIRST CYCLE: \((\text{rut}) \rightarrow \text{u:a} \rightarrow \text{rt})
SECOND CYCLE: \((\text{rt}+\text{a}) \rightarrow \text{[no rules apply]})

From the derivation of RTA it can be seen that \((\text{u:a})\) must be restricted to apply only at the level of word boundary; without this restriction, from nom. sg. \(((\text{rut})+\text{u})\), application of \((\text{u:a})\) would delete the root vowel on the first cycle and the desinential vowel on the second cycle, producing the incorrect form \(*\text{rt}.*\)

---

\(^1\)Details, see Chomsky and Halle, Sound Pattern of English.
(u:∅) [u,1] → ∅ / ______ x ##
where x represents any string not containing ##

nom. sg. ROT: ((rut)+u)
FIRST CYCLE: (rut) [no rules apply]
SECOND CYCLE: (rut+u) → u:∅ → (rot+u) → u:∅ → (rot)

gen. sg. RTA: (rut+∅)
FIRST CYCLE: as above
SECOND CYCLE: (rut+∅) → u:∅ → (rt+∅)

2. Verb Structure.

Present tense forms have the following structure (PS for present stem):

\[
\mathcal{V}(\text{PS(root + verb suffix + present)}_{PS} + \text{person-number ending})_{V}
\]

Infinitive forms have no internal structure:

\[
\mathcal{V}(\text{root + verb suffix + infinitive})_{V}
\]

Examples:

inf. SDET': (sid+∅+t,)

---

2The contents of this chapter rely heavily on Halle, "0 pravilax russkogo sprjaženija"; see also my "0 cikličeskix pravilax."
1 sg. SIZU: \((s\ddot{I}d+\ddot{e}+\ddot{I})+U\)^3

3 sg. SIDIT: \((s\ddot{I}d+\ddot{e}+\ddot{I})+t\)

inf. PISAT': \((p\ddot{I}s+\ddot{e}+t,\)

1 sg. PIŠU: \((p\ddot{I}s+\ddot{e}+e)+U\)

3 sg. PIŠET: \((p\ddot{I}s+\ddot{e}+e)+t\)

The first and third rules of the transformational cycle (TC) are as follows:

\[(\ddot{V}:j) \quad \ddot{V} \rightarrow \ddot{J} \quad / \quad \quad + \quad [+\text{voc}] \quad [-\text{cons}] \quad [-T] \]

\[(\ddot{V}:\emptyset) \quad \ddot{V} \rightarrow \emptyset \quad / \quad \quad + \quad \quad \quad + \ddot{V} \]

3. SIDET' and PISAT'.

Rules \((\dddot{V}:j)\) and \((\dddot{V}:\emptyset)\) apply to the representations given in section 2 above in the following manner:

SIDET': \(s\ddot{I}d+\ddot{e}+t,\) [neither rule applies]

SIZU: \((s\ddot{I}d+\ddot{e}+\ddot{I})+U\)

**FIRST CYCLE:** \((s\ddot{I}d+\ddot{e}+\ddot{I}) \rightarrow \dddot{V}:\emptyset \rightarrow (s\ddot{I}d+\ddot{I})\)

**SECOND CYCLE:** \((s\ddot{I}d+\ddot{I}+U) \rightarrow \dddot{V}:j \rightarrow (s\ddot{I}d+j+U)\)

---

^3For the present we use the symbol \(U\) to represent a \(-T\) vowel which underlies the 1 sg. phone \([u]\) (see IV.5).
SIDIT: ((sīd+ē+ī)+t)

FIRST CYCLE: (sīd+ē+ī) \rightarrow V:Ω \rightarrow (sīd+ī)
SECOND CYCLE: (sīd+ī+t) [neither rule applies]

PISAT*: (pīs+ō+t, ) [neither rule applies]

PIŠU: ((pīs+ō+e)+U)

FIRST CYCLE: (pīs+ō+e) \rightarrow V:j \rightarrow (pīs+j+e)
SECOND CYCLE: (pīs+j+e+U) \rightarrow V:Ω \rightarrow (pīs+j+U)

PIŠET: ((pīs+ō+e)+t)

FIRST CYCLE: (pīs+ō+e) \rightarrow V:j \rightarrow (pīs+j+e)
SECOND CYCLE: (pīs+j+e+t) [neither rule applies]

Later rules, which we give in V.1, will account for transitive softening, i.e., the shift of ē to ū, s to ū etc. before j.

4. KOVAT' and LOVIT'.

Forms like inf. KOVAT', 3 sg. KUET 'forge' show an ov:u alternation. If we postulate that the phone u in these forms is derived from the representation ou, then the derivation of 3 sg. KUET will be as follows:

KUET: (kou+ō+e)+t)

FIRST CYCLE: (kou+ō+e) \rightarrow V:j \rightarrow (kou+j+e)
SECOND CYCLE: (kou+j+e+t) [neither rule applies]

The inf. and past forms, which show v, are derived from
the same root *kou* by requiring application of the following rule between (*v*:j) and (*v*:∅):

\[(u:v) \ u \rightarrow v \ / \ \_v\]

Introduction of (*u:v*) does not affect any of the derivations given above; incorporation of this rule within the grammar will, however, permit us to derive many occurrences of *v* from the underlying vowel *u*: *VODA* 'water' from *uod+5*, *NOVYJ* 'new' from *nou+0j* etc.

Consideration of the peculiar constraints on the voicing assimilation of *v* (*VTOROJ* 'second' [f'tarj], but *TVOJ* 'your' [tvɔj]) leads us to revise (*u:v*) in the following manner:

\[(u:w) \ u \rightarrow w \ / \ \_v\]

Later rules (given in XII) will derive *v* from all *w*'s.\(^4\)

\(^4\)In that chapter we will account for voicing assimilation in the manner suggested by Roman Jakobson, "Die Verteilung der stimmahaftenen und stimmblosen Geräusche im Russischen." It will be shown immediately below, however, that introduction of an intermediary glide *w* is motivated by other considerations than the desire to account properly for voicing assimilation. We note in passing (details in VI.6) that the final segment of the root in *ZIT* 'to live' must be *w* (not *v*) in order for rule (*S*:∅) to apply properly: *Zi-wt*, →*S*:∅→ *Zi+t*.
The three TC rules given thus far account not only for the \text{ov} : \text{uj} alternation in \text{KOVAT}' : \text{KUET}, but also for the \text{v} : \text{vl} alternation in 3 sg. \text{LOVIT}, inf. \text{LOVIT}' : 1 sg. \text{LOVLJU} 'hunt':

\text{LOVIT}': (\text{lou}+\text{i}+\text{t},) \quad -u:w\rightarrow (\text{low}+\text{i}+\text{t},)

\text{LOVIT}: ((\text{lou}+\text{i}+\text{i})+\text{t})

\text{FIRST CYCLE:} (\text{lou}+\text{i}+\text{i}) \quad -\overline{V}:j\rightarrow \text{inapplicable} \quad -u:w\rightarrow \\
(\text{low}+\text{i}+\text{i}) \quad -\overline{V}:\emptyset\rightarrow (\text{low}+\text{i})

\text{SECOND CYCLE:} (\text{low}+\text{i}+\text{t}) \quad \text{[no rules apply]}

\text{LOVLJU}: ((\text{lou}+\text{i}+\text{i})+\text{U})

\text{FIRST CYCLE:} (\text{lou}+\text{i}+\text{i}) \quad -u:w\rightarrow (\text{low}+\text{i}+\text{i}) \quad -\overline{V}:\emptyset\rightarrow \\
(\text{low}+\text{i})

\text{SECOND CYCLE:} (\text{low}+\text{i}+\text{U}) \quad -\overline{V}:j\rightarrow (\text{low}+\text{j}+\text{U})

5. \text{LOVLJA} and \text{TORGOLJJA}.

Consideration of the \text{v} : \text{vl} alternation in deverbal substantives like \text{LOVLJA} 'hunting', \text{TORGOLJJA} 'trading' etc. will permit us to generalize the above formulation of \text{(u:w)} as follows:

\[
\begin{align*}
\text{(u:w)} & \quad \left[ \begin{array}{c}
\text{-cons} \\
\text{-T} \\
\text{+diff}
\end{array} \right] \quad \rightarrow \quad \left[ \begin{array}{c}
\text{-vocalic} \\
\text{+vocalic} \\
\text{-cons}
\end{array} \right] \\
\end{align*}
\]

Thus \text{LOVLJA} is derived from \text{((lou+i)+\ddot{o})}, where \text{i} represents the noun suffix (cf. p. 33). In \text{TORGOLJJA}, from \text{((torg+ou+i)+\ddot{o})}, a special pre-verb suffix \text{ou} occurs (cf. \text{TORG} 'bargaining',
which shows the bare root morpheme. The derivation of these forms is as follows:

LOVLJA: (lou+1)+ Meditation
FIRST CYCLE: (lou+1) -u:w- (low+1)  
SECOND CYCLE: (low+1+5) -u:w- (low+j+5)

TORGOLJA: ((torg+ou+1)+6)  
FIRST CYCLE: (torg+ou+1) -u:w- (torg+ow+1)  
SECOND CYCLE: (torg+ow+1+5) -u:w- (torg+ow+j+5)

It is necessary to point out that the analysis of the forms LOVIT', LOVIT, LOVLJU, LOVLJA, TORGOVAT', TORGUBT, TORGOL-
VLJA cannot be simplified in any obvious way. Thus, for example, we cannot revise (u:w) to read

\[ *(u:w) \quad [\text{-cons}] \quad \to \quad [\text{-vocalic}] \quad / \quad \quad [\text{-cons}] \]

because this rule would give an incorrect derivation of present tense forms like TORGUBT:

FIRST CYCLE: (torg+ou+5+e) -\( \tilde{v} \):j- (torg+ou+j+e)  
-*(u:w) \to \quad *(torg+ow+j+e)

Further, we cannot use an archiphoneme \([\text{i},\text{j}] = \text{i}\) for the substantive suffix because this would lead to incorrect derivations of the substantives:
LOVLJA: ((lou+I)+5)

FIRST CYCLE: (lou+I) \(-u:w->\) inapplicable \(-\nu:0->\) ?

For the same reason, we cannot use the noun suffix \(\dot{I}\).  
Because \((u:w)\) derives \(\dot{I}\) from \(-T\), we might consider revising \((\nu:j)\) to read

\[ *(\nu:i) \quad \nu \rightarrow \dot{I} \quad / \quad + \quad [\begin{array}{c}
+\text{voc} \\
-\text{cons} \\
-\text{T}
\end{array}] \]

Although this formulation applies properly in forms like 1 sg. SIZU and 3 sg. PILSET, it fails in the pres. tense of verbs in -OVAT' :  

3 sg. KUET: (kou+5+e)+t)

FIRST CYCLE: (kou+5+e) \(\rightarrow^* (\nu:i) \rightarrow\) (kou+i+e) \(-u:w[\text{twice}] \rightarrow\) *(kow+j+e)

6. KLEVAT' and other verbs in -EVAT' : -JUJUT.

Consideration of forms like KLEVAT' : KLIJUET 'peck, bite' shows that the phone [u] may be derived from eu as well as ou:

KLEVAT': (kleu+5+t,) \(-u:w->\) (klew+5+t,)

---

5This fact will cause a problem in the derivation of the two forms ZEMEL'NYJ, KORABEL'NYJ; cf. VIII.3.
KLJUET: ((kleu+5+e)+t)

FIRST CYCLE: (kleu+5+e) \rightarrow (kleu+j+e)
SECOND CYCLE: (kleu+j+e+t) [no rules apply]

Nom. sg. KLEV 'biting' may be derived from the same root kleu, either by permitting (u:w) to apply before word boundary, or else by postulating a vowel for nom. sg. ending. As we have already stated (p. 28), we will assume the ending u for the nom. sg. Rule (u:w) may thus remain as formulated on page 38. The derivation of KLEV:

KLEV: ((kleu)+u)

FIRST CYCLE: [no rules apply]
SECOND CYCLE: (kleu+u) \rightarrow (klew+u)

The following roots which end in eu take the verb suffix 5 and are therefore conjugated like KLEVAT': geu (ZEVAT' 'to chew, masticate'), gleu (BLEVAT' 'to vomit'), pleu (PLEVAT' 'to spit').

The remaining verbs in -EVAT' with present in -UJUT/-UJUT present a minor problem in analysis. We could, of course, assume that verbs like GOREVAT' 'to grieve', BLOEVAT' 'to flagellate' etc. were derived with the help of the suffix eu. For these two verbs, the roots would then be gor and bik, respectively. The derivations would be similar to the derivations of

---

6See IX.1 for the derivations of 3 sg. ZUET and pl. past ZEVALLI.
the verbs KLEVAT', ŽEVAT', except that in those verbs eu is part of the root, in GOREVAT', BIČEVAT' a separate suffix.

There are two objections against this straightforward analysis. In the first place, we would be obliged to mark each root in question as to whether it took the front vowel suffix eu or the back vowel suffix ou. In the second place, we will clearly want to relate the verbs in -EVAT' with the corresponding nouns (GOREVAT' 'to grieve' - GORE 'grief', BIČEVAT' 'to flagellate' - BIČ 'whip', MEŽEVAT' 'to survey, set boundaries' - MEŽA 'boundary' etc.). In VI.1 and XI.2, we shall show that the root of MEŽA is mēd; if we were to derive MEŽEVAT' from this root, however, we would have to make a special rule for transitive softening before the eu suffix (i.e., mēd+eu → mēž+eu).

An alternative analysis, the one we shall use here, is to derive verbs in -EVAT' from noun stems. In Chapter XI we shall explain how the final consonant of noun stems is sharpened (gor, from gor in GORE) and how palatals in stem final position are predicted (bič from bič+k in BIČ, mēž from mēd in MEŽA). Here we shall simply use the noun stem without explaining how the stem final consonant is analyzed. Given stems like gor, bič, mēž etc., we can use a single suffix, ou, for all suffixed verbs in -OVAT'/-EVAT'. Inf. GOREVAT' will be derived from \( V(\text{NS}(\text{gor}),_{\text{NS}} + \text{ou} + ó + t,)_V; 3\text{ sg. GORJUET from } V(\text{PS}(\text{NS}(\text{gor}),_{\text{NS}} + \text{ou} + ó + e)_{\text{PS}} + t)_V; \text{ inf. MEŻEVAT' from } (\text{mēž})\text{+ou}+ó+t,); 3\text{ sg. MEŽUET from } (((\text{mēž})\text{+ou}+ó+e)+t)\text{ etc.}

APPENDIX I to this chapter lists the verbs in -EVAT' a-
7. **A Few General Considerations.**

In this chapter we have shown the need for requiring at least three rules to apply within the domain of a constituent. The fact that reference to constituent structure has permitted us to account for several related, but superficially disparate phenomena in a simple, revealing way justifies the analysis presented here.

The introduction of the TC into the phonological component raises an important question which we have not yet considered: the reality of the IC structure which we have imposed on underlying representations; in order for the proposed analysis to be descriptively adequate, we must not assign *ad hoc* structure to the underlying forms. We are not yet in a position to discuss long with the nouns from which these verbs are derived. Note that there are some verbs which do not seem to have underlying nouns; in these cases we posit the nouns in order to derive the verbs. This operation is the same as Bloomfield's postulation of an underlying, theoretical verb *preceive in order to account for the existence of the noun précept (Language, p. 220)—except, of course, that Bloomfield has to postulate a verb to account for a noun and we have to postulate a noun to account for a verb. We are both motivated by the desire to account for the facts in the simplest, most general manner.

In APPENDIX II we give evidence to show that all occurrences of the suffix spelled -OV-/-EV- may be derived from the single underlying representation _ou_.

this question but will return to it in Chapter VIII.

Another question which we shall postpone is the order of application of the rules. In the following chapters we will be primarily concerned with formulating and justifying the rules of the grammar; in Chapter XIII we will impose a tentative partial ordering on the rules proposed in earlier chapters.

In order to lessen the reader's task we occasionally simplify derivations. Thus, for example, in IV.1 we give the derivation of gen. pl. VREMEN from vre+mén+u. The underlying representation, of course, has the deeper structure $N(\text{NFS}(\text{vre+men})_N + u)_N$, and the derivation must go through two cycles.

In IV.1, however, our major concern is to formulate a rule which applies to vowels before $N\{C\}$; whether the derivation goes through a single cycle or through two cycles is not a pertinent consideration in this chapter, and we therefore give an oversimplified presentation. The correct derivation of all forms mentioned in the text can be obtained by proper application of the rules as they are given in Chapter XIII.

APPENDIX I. List of verbs with inf. in -EVAT' formed with the help of the suffix ou (verbs in -CEVAT' are discussed separately in Chapter X).

BICEVAT', -UJUT 'flagellate' - BIC 'whip'
VOEVAT', -JUJUT 'wage war' [cf. VOJNA 'war' and VOJSKO 'army'
from the root uo]
VRAČEVAT', -UJUT 'doctor' - VRAČ 'doctor'
GOREVAT', -UJUT 'grieve' - GORE 'grief'
DNEVAT', DNUJUT 'spend time/the day' - DEN 'day'
LINČEVAT', -UJUT 'lynch' - LINČ 'lynch'
MALEVAT', -UJUT 'paint' [cf. MALJAR 'painter' from ((mal,) +ar)]
MEŽEVAT', -UJUT 'survey' - MEŽA 'boundary'
NOČEVAT', -UJUT 'spend the night' - NOČ 'night'
SVEŽEVAT', -UJUT 'skin, dress' - SVEŽIJD 'fresh'
TUŠEVAT', -UJUT 1. 'shade (a drawing, picture)' - TUŠ 'India ink';
    2. 'touch a ball accidentally [billiards]' - TUŠ 'accidental
touching of a ball'
ČAEVAT', -UJUT 'sit long over one's tea' - ČAJ 'tea'
ŠTEMELEVAT', -UJUT 'stamp' - ŠTEMPEL 'stamp'
ŠTILEVAT', -UJUT 'be becalmed [nautical]' - ŠTIL 'calm'
BUŠEVAT', -UJUT
KALEVAT', -UJUT
KORČEVAT', -UJUT
KOČEVAT', -UJUT
LINEVAT', -UJUT : LINOVAT', -UJUT
PEKLEVAT', -UJUT
POLEVAT', -UJUT 'hunt, shoot' [prob. from the root in POLE
    'field']
POTČEVAT', -UJUT
TRELEVAT', -UJUT
FRIŠEVAT', -UJUT
ŠALEVAT', -JUJUT
ŠPAKLEVAT', -JUJUT

APPENDIX II. Other occurrences of the suffix -OV-/EV- are similar to those given in APPENDIX I. We give a small sample below; the full lists are obtainable from an a tergo dictionary.

1. Adjectives in -OVYJ/-EVOJ, -OVOJ/-EVOJ.

BOBOVYJ 'bean' - BOB 'bean'
IVOVYJ 'willow' - IVA 'willow'
FIGOVYJ 'fig' - FIG 'fig'
SADOVYJ 'garden' - SAD 'garden'
ROZOVYJ 'rose-coloured' - ROZA 'rose'
LAKOVYJ 'varnish' - LAK 'varnish'
STOLOVYJ 'table' - STOL 'table'
XROMOVYJ 'chrome' - XROM 'chromium, chrome'
KLENOVYJ 'maple' - KLEN 'maple'
LAMPOVYJ 'lamp' - LAMPA 'lamp'
TIGROVYJ 'tiger' - TIGR 'tiger'
TESOVYJ 'board, plank' - TES 'boards (collect.)'
KETOVYJ 'Siberian salmon' - KET 'Siberian salmon'
etc.

GORNOSTAEVYJ 'ermine, stoat' - GORNOSTAJ 'ermine, stoat'
ŽELUDÉVYJ 'acorn' - ŽELUD 'acorn'
GRYŽEVYJ 'hermial' - GRYŽA 'rupture'
KALIEVYJ 'potassium' - KALIJ 'potassium'
DVADCATIRUBLÉVYJ 'of twenty roubles' - RUBL 'rouble'
KREMНÉVYJ 'made of flint' - KREMEN 'flint'
SITCEVYJ 'cotton' - SITEC 'cotton'
GRУСЕVYJ 'pear' - GRУSA 'pear'
e tc.

LOBOVOJ 'frontal' - LOB 'forehead'
PRAVOVOJ 'legal' - PRAVO 'law'
SNEGGOVOJ 'of snow' - SNEG 'snow'
GODOVOJ 'annual' - GOD 'year'
GRUZGOVOJ 'cargo' - GRUZ 'freight, cargo'
POLKOVOJ 'regimental' - POLK 'regiment'
MELOVOJ 'chalky' - MEL 'chalk'
GROMOVOJ 'thunder(ous)' - GROM 'thunder'
GRUPPOVOJ 'group' - GRUPPA 'group'
XOROVOJ 'choral' - XOR 'chorus'
NOSOVOJ 'nasal' - NOS 'nose'
VINTOVOJ 'screw' - VINT 'screw'
PAXOVOJ 'inguinal' - PAX 'groin'
e tc.

KRAEVOJ 'regional' - KRAJ 'land, territory'
DOŽDEVOJ 'pluvian' - DOŽD 'rain'
KLEEEVOJ 'glue' - KLEJ 'glue'
MEŽEVOJ 'boundary' - MEŽA 'boundary'
GRJAŽEVOJ 'mud' - GRJAŽ 'mud'
POLEVOJ 'field' - POLE 'field'
OGNEVOJ 'fire' - OGON 'fire'
BOEVOJ 'battle, fighting' - BOJ 'battle, fight'
VIXREVOJ 'vortical' - VIXR 'whirlwind'
LOKTEVOJ 'elbow' - LOKOT 'elbow'
LICEVOJ 'facial' - LICO 'face'
RECCEOVOJ 'speech' - RECČ 'speech'
DUSEVOJ 'soul' - DUSĂ 'soul'
PISCEVOJ 'food' - PISČĂ 'food'
BEL'EVOJ 'linen' - BEL'E 'linen'
ZVEN'EVOJ 'team, group' - ZVENO (nom. pl. ZVEN'JA) 'team, group'
e tc.

2. Nouns in -OVIK/-EVIK.

POLOVIK 'doormat, floor-cloth' - POL 'floor'
STURMOVIK 'low-flying attack-plane' - STURM 'assault, storm'
PLANOVIK 'planner' - PLAN 'plan'
FRONTOVIK 'front-line soldier' - FRONT 'front'
GRUZOVIK 'truck' - GRUZ 'load, freight, cargo'
PUXOVIK 'feather bed' - PUX 'down'
e tc.

DOŽDEVIK 'raincoat' - DOŽĐ 'rain'
BRONEVIK 'armoured car' - BRONJA 'armour'
GIREVIK 'weight-lifter' - GIRJA 'weight'
PISČEVIK 'food-industry worker' - PISČĂ 'food'
e tc.

3. Nouns in which the suffix -EV- is stressed (DUSEVNYJ, CARE-VNA etc.) will be discussed in IX.2.
IV. THE TREATMENT OF VOWELS BEFORE \( N\{C\} \).

1. Neuter Nouns in -JA.

Neuter nouns in -JA have an \( a : VN \) alternation; thus VREMJA 'time; season; tense [gramm.]', for example, has gen. sg. VREMENI, gen. pl. VREMEN. We will derive these nouns with the help of the suffix men and generalize rule (2') of page 27 to account for these alternations:

\[
(VN) \quad \begin{align*}
\text{[+vocal]} & \quad \rightarrow \quad \ddot{o} \quad / \quad \text{[CONS]} \\
\text{[-cons]} & \quad \text{[grave]} \\
\end{align*}
\]

The underlying representations of the forms of VREMJA mentioned above are nom. sg. vre+men\(^1\), gen. sg. vre+men+i, gen. pl. vre+men+u, with nom. sg. ending zero, gen. pl. ending u\(^2\). The derivations of these forms are as follows (note that (VN) must apply before (e:o)):

\(^1\)At this point in our discussion we cannot decide whether the root vowel should be +T or -T because the consonant following the root is always sharp (n.s. [vr, ćm, a], g.s. [vr, ćm, in, i] etc.). Here we make the arbitrary decision of using -T e; in V.2, however, we shall examine this question more closely.

\(^2\)Cf. the ending postulated for NES, ROT etc. (p. 28) and for KLEV (p. 41). See also IV.4.1 below.
VREMJA: vreymen →C:C, v,r,é+m,én →VN→ v,r,é+m,ó

VREMENI: vreymen+t →C:C, v,r,é+m,én,+t →VN→ inapplicable →e:o→ inapplicable

VREMEN: vre+mén+u →C:C, v,r,e+m,én+u →VN→ inapplicable →u:∅→ v,r,e+m,én →e:o→ v,r,e+m,ó

Application of the following rule will drop the final nasal in representations like v,r,é+m,ón:

(N:∅) N → ∅ / #

The derivation of nom. sg. VREMJA thus continues as follows:

v,r,é+m,ón →N:∅→ v,r,é+m,ô

In order not to drop the final nasal of gen. pl. VREMEN, rule (N:∅) must apply before (u:∅):

v,r,e+m,én+u →N:∅→ inapplicable →u:∅→ v,r,e+m,én
→e:o→ v,r,e+m,ó

With the reverse order, however:

v,r,e+m,én+u →u:∅→ v,r,e+m,én →N:∅→ *v,r,e+m,é

2. ZVENET’: ZVJAKAT’, SEST’: SJADU, LEČ’: LJAGU.

We consider now a few cases of related words whose derivations undergo or fail to undergo application of (VN).
The forms ZVENET' 'to ring' and ZVJAKAT' 'to tinkle' are both derived from the same root zuen:

ZVENET': zuen+ē+t,  -u:w→ zwen+ē+t,  -C:C,→
     z,w,ēn,+ē+t,  -VN→  inapplicable

ZVJAKAT': zuen+k+ōj+t,  -u:w→ zwen+k+ōj+t,  -C:C,→
     z,w,k+ōj+t,  -VN→  z,w,ōn+k+ōj+t,  -S:Ø[twice]→
     z,w,ō+k+ō+t,

The verbs SEST' 'to sit down' and LEC' 'to lie down' show peculiar vowel alternations: ē : ō in SEST' (past SEL : pres. SJADU) and e : ō in LEC' (past LEG : pres. LJAGU). We account for these alternations by assuming that a nasal consonant N is infixed in these two roots when used in pres. tense forms:

SEL: sē+d+l  -C:C,→  s,ē+d+l  -dl:l³→  s,ē+l

SJADET: ((sēnd+e)+t)

FIRST CYCLE: (sēnd+e)  -C:C,→  (s,ēn,d,+e)  -VN→
     (s,ōn,d,+e)  -S:Ø→  (s,ōd,+e)

SECOND CYCLE: (s,ōd,+e+t)  →e:o→  (s,ōd,+o+t)

LEG: leg+l  -C:C,→  l,eg+l  →e:o→  l,og+l  →l:Ø⁴→  l,og

³This well-known rule is discussed in APPENDIX III to Chapter IV.

⁴This well-known rule is discussed in APPENDIX III to Chapter IV.
LJAÅŽET: ((leng+e)+t)

FIRST CYCLE: (leng+e) → k:ø → (leng+e) → C:C, →
(1, en, ʒ, +e) → VN → (1, õn, ʒ, +e) → S:Ø → (1, õʒ, +e)
SECOND CYCLE: (1, õʒ, +e+t) → e:o → (1, õʒ, +o+t)

3. The 3 Plural Ending -AT/-JAT.

The proper specification of the 3 pl. ending -AT/-JAT presents a serious problem because stem final consonants are always either palatal (SPESÅT [s,p,išat] 'they hurry') or sharp (GOVORJAT [gəvar,iät] 'they talk') before this phonetic back vowel ending. We cannot assume that the roots of these forms terminate in an underlying palatal or sharp consonant, for then we could not explain the phonetic velar or non-sharp consonant in clearly related forms like SPEX 'hurry', GOVOR 'sound of talking'. This problem can be most easily solved if we postulate the 3 pl. ending n+t.5 The derivations are as follows:

GOVORJAT: ((gouor+i+t)+n+t)

FIRST CYCLE: (gouor+i+t) → u:w → (gouor+i+t) → V:Ø →
(gouor+i) → C:C, → (gouor,+i)
SECOND CYCLE: (gouor,+i+n+t) → VN → (gouor,+o+n+t)
→ S:Ø → (gouor,+o+t)

5The ending must be bimorphemic to show the relation between 3 sg. and 3 pl.; the segment t represents the third person morpheme.
SPESAT: ((spēx+1+1)+n+t)

FIRST CYCLE: (spēx+1+1) →V:∅→ (spēx+1) →k:∅→
(spēx+1) →C:∅,→ (s,p,ēx,+1)

SECOND CYCLE: (s,p,ēx,+1+n+t) →VN→ (s,p,ēx,+5+n+t)
→S:∅→ (s,p,ēx,+5+t)

4. The Form of Rule (VN).

We consider now examples which will permit us to gener-
alize rule (VN) to apply to both front and back vowels; front vows-
els before N{C} will result in [ā], back vowels in [ũ]:

(VN) [+vocal] → [+grave]
[<cons] → [⟨diff ]
[<grave] → [+T ]

N{C}

4.1 Inclusion of (VN) within the grammar permits us to de-
rive the forms ZVON 'peal, chime' and of ZVUK 'sound' from the
same lexical morpheme, zuon, provided only that we postulate the
nominate singular ending u:

ZVUK: zuon+k+u →u:w→ zwon+k+u →VN→ zwūn+k+u →u:∅→
zwūn+k →S:∅→ zwū+k

ZVON: zuon+u →u:w→ zwon+u →VN→ inapplicable →u:∅→
zwon

cf. ZVON: zuon →u:w→ zwon →VN→ *zwūn
4.2 Comparison of ZVON : ZVUK with ZVENET' : ZVJAKAT' (page 51) shows that if the grammar includes an e : o ablaut rule, all four forms may be derived from the same root zuen.6 We give below a short list of morphemes which show e : o before NC:

( 1 ) toNg    TUGOJ     'tight, taut'
      NATUGA    'effort, strain'
      TUZIT'SJA 'exert oneself'
     teNg     TJAŽELYJ 'heavy'
      TJANUT'    'pull, haul, drag'
      TJAGOST'    'burden'

6Alternatively, we could derive all forms from the root zuon and require an o : e ablaut rule; in what follows we make the (unjustified) assumption that the base forms contain e. Although it is not clear to me how this ablaut rule should be formulated, there can be no doubt that such a rule is required in the grammar. The forms which most clearly show the need for this rule are probably the "motion" verbs NOSIT' : NESTI, VOZIT' : VEZTI etc. (cf. p. 13 fn. 6, and pp. 15-16). Many of the e : o alternations given immediately below and throughout the rest of the thesis seem equally convincing to me. The difficulty, of course, is finding a principled reason for deciding whether forms like LUKA 'pommel (of a saddle); bend (of a road, river)' and LJAKA 'ljaka (a kind of dog with a saddle-shaped, curved back)' should be derived from the same lexical root (lenk) or not.
(ii)  treNs  TRJASTI  'to shake'
        trons  TRUSIT'  'to shake'

(iii) sken7  ŠCADIT'  'to spare, have mercy (up)on'
        skonD  SKUDNYJ  'scanty, poor, meagre'
        SKUDOST'  'scarcity, poverty'

(iv)  meNt  SMJATENIE  'confusion, perturbation'
        MJATEŽ  'mutiny, revolt'
        monto  SMUTIT'  'to confuse, disturb, trouble'
        SMUT'JAN  'trouble-maker, seditious'

(v)  preNg  SPRJAGAT'  'to conjugate'
        NAPRJAČ'  'to strain, exert'
        ZAPRJAČ'  'to harness'
        PRJAŽKA  'buckle, clasp'
        prong  SUPRUG  'spouse'
        PRUŽINA  'spring'
        UPRUGIJ  'elastic, resilient'

---

7In this morpheme, (k:č) will apply to derive ščend; a rule discussed in APPENDIX III of this chapter will derive š from š before č. The derivation of ŠCADIT', then, will be as follows:

`skend+I+t, -k:č- ščend+I+t, -C:C-, s,č,en,d,+I+t,
 -VN- s,č,ŏn,d,+I+t, -S:š- s,č,ŏd,+I+t, -s:š-
 š,č,ŏd,+I+t,`
4.3 Forms of the verb BYT' 'to be' show a nasal infix in the pres. BUDU, BUDEŠ etc.; the inf. and past tense forms are thus derived from the root būd, pres. tense forms from the same root with infixed N, būnd. The BYT' : BUDET alternation is thus parallel to the SEST' : SJADET, LŠO' : LJAJET alternations mentioned on pages 51-52. For derivations see IV.6.2.

8 We will not attempt to explain the u : ţ alternation in the initial segment of this word. In APPENDIX IV to Chapter VI we explain the absence of initial ţ in UZY, UZKIJ, and in VI.3 we explain the full form of the prefix SO- in SOJUZ, the reduced form S- in SVJAZ'.

9 Four (there may be more) other verbs which show an unexpected nasal in pres. tense forms are STYT' (past STYL) : STYNET 'get cold', STAT' (past STAL) : STANET 'begin; become', KLJAST' (past KĻJAL) : KĻJANET 'to curse, swear', and DET' (past DĒL) : DENET 'put, place'. None of these verbs shows the nasal infix under discussion, and since they are all somewhat irregu-
lar, we will treat them parenthetically in this footnote.

(i) STYT' : STYNET. The inf. and past forms have doublets STYNUT', STYNUL, derived from the root stūd followed by the suffix -NU- (discussed in IV.8). We derive the exceptional forms STYT', STYL etc. from the bare root stūd. The pres. tense forms are regular, derived from the verb stem STYNU-. The root stūd is of further interest because it, like the roots in SLYSAT' 'to hear': SLUSAT' 'to listen', GIBNUT' 'to perish': GUBIT' 'to destroy, ruin' etc. shows an ū : ou ablaut (cf. forms like STUDENJY 'very cold', STUDIT' 'to cool' etc.). These forms (and also the [o,e]LC forms discussed in V.2) suggest that there might be a level of representation deeper than the one considered here at which the vowels we consider +T are clusters of two identical -T vowels. The representations of the roots in STYT' and STUDIT' would then be stuud and stoud, related by an ū : o ablaut rule.

(ii) STAT' : STANET. We will treat this verb like STYT' : STYNET and assume that the pres. tense forms are derived from the stem STANU-, the past tense forms from the bare root. If this root is related to the root in STOJAT' 'to stand' (cf. VSTAT' 'to stand up'), then the root will be stōd.

(iii) DET' : DENUET is also treated like STYT' : STYNET; the root here is ded, and in the forms of the verb DET', this root is specially marked so that it does not undergo (e:o) (cf. past DĖL and not *DĒL). We discuss this marking in Chapter V. For now, note that in OĎŽDA 'clothes', from o#dēd+1+ō, not only does (e:o) not apply, but the transitive softening of d results in ḏd rather than ḏ; in colloq. OĎŽA 'clothes', also from o#dēd+1+ō, e → o and d → ď in the usual manner.

(iv) KLJAST' : KLJANET (cf. DI PROKLINAT'). These forms are de-
rived from the root klin, which is exceptional in that (S:Ø) does not apply in the inf. and that the root vowel is lowered in pres. tense forms. These facts will be marked in the lexicon as two of the idiosyncratic properties of the root klin. The derivations of a few relevant forms:

KLJANET: klin+ēt → C:C, k,l,in,+ē+t → VN inapplicable → u:o→ k,l,en,+ē+t → e:o→ k,l,en,+ē+t [the application of later rules will derive kl, in, ūt]

PROKLINAT': (pro#klin+ōj+t,)DI → V:V → (pro#klin+ōj+t,)DI
[the derivation continues as in that of NAGINAT' on p. 30]

KLJAL: klin+1+u → C:C, k,l, in+1+u → VN k,l,ōn+1+u
→ u:Ø→ k,l,ōn+1 → S:Ø→ k,l,ō+1

KLJAST': klin+t, → C:C, k,l, īn+t, → VN→
(S:Ø) → (S:Ø) inapplicable → C:s→ k,l,ās+t,
(S:Ø) [rule (C:S), discussed in APPENDIX III, is the rule which derived VESTI 'to lead' from the root ued]
5. The 1 Sg. Ending -U/-JU and the 3 Pl. Ending -UT/-JUT.

Both these endings present problems in analysis: we would like to show the relation between athematic m (DAM 'I shall give', EM 'I eat') and thematic u (PEKU 'I bake', PLA-ÇU 'I pay' etc.), and we would like to posit the same 3 pl. (n+t) for both first and second conjugation verbs (cf. pp. 52-53). The problem, of course, is that the pres. tense theme is a front vowel in both conjugations, and that application of (VN) to a front vowel before $N[C,N]$ will derive $o$, not the desired $u$. For 1 sg. PEKU and 3 pl. PEKUT we need the representations pek+0+m and pek+0+n+t, where 0 represents a grave vowel; for 1 sg. PLAÇU we need the representation plôt+j+0+m. From the last form, we can see that 0 must be -T in order for rule (V:j) to apply properly. We require, therefore, application of the following ad hoc rule:

$$(V:0) \ V \rightarrow [+\text{grave}] / \underbrace{-T} + N +$$

In order to prevent (V:0) from applying to the theme $u$ before n+t, we require that the following rule apply immediately before (V:0):

$$(V:0\text{-exc}) \ [ -T \ ] \rightarrow [-\text{next rule}] / \underbrace{} \ [ -\text{grave}]$$

Given rule (V:0), we can posit 3 pl. n+t for both conjugations, 1 sg. mu for athematic verbs, and 1 sg. m for the-
matic verbs. If we consider the order of application of \((V:0)\) with respect to the other rules of the grammar, we see that it must apply before \((V:\emptyset)\):

**PLAÇU**: \((\langle pl\tilde{\alpha}t+i+i\rangle+m)\)

**FIRST CYCLE**: \((\langle pl\tilde{\alpha}t+i+i\rangle) \quad -V:j \rightarrow \text{inapplicable} \quad -V:\emptyset\rightarrow \)

\[ (pl\tilde{\alpha}t+i) \quad -C:C, \rightarrow \quad (pl\tilde{\alpha}t,+i) \]

**SECOND CYCLE**: \((\langle pl\tilde{\alpha}t,+i+m\rangle) \quad -V:0 \rightarrow \quad (pl\tilde{\alpha}t+u+m) \rightarrow VN\rightarrow \)

\[(pl\tilde{\alpha}t+u+m) \quad -N:\emptyset \rightarrow * (pl\tilde{\alpha}t,+\ddot{u}) \]

In order for rule \((\overline{V}:j)\) to apply to the representation of 1 sg. PLAÇU, rule \((\overline{V}:0)\) must not only apply before \((V:\emptyset)\), but must apply without reference to the intervening constituent boundary. Rule \((V:0)\) is thus a pre-cycle rule. The proper derivations of PLAÇU, PEKUT, PEKU are as follows:

**PLAÇU**: \((\langle pl\tilde{\alpha}t+i+i\rangle+m)\)

**PRE-CYCLE**: \((\langle pl\tilde{\alpha}t+i+i\rangle+m) \quad -V:0 \rightarrow \quad (pl\tilde{\alpha}t+i+u+m) \]

**FIRST CYCLE**: \((pl\tilde{\alpha}t+i+u) \quad -\overline{V}:j \rightarrow \quad (pl\tilde{\alpha}t+j+u) \rightarrow C:C, \rightarrow \)

\[ (pl\tilde{\alpha}t,+j+u) \]

**SECOND CYCLE**: \((pl\tilde{\alpha}t,+j+u+m) \quad -VN\rightarrow \quad (pl\tilde{\alpha}t,+j+\ddot{u}+m) \]

\[ -N:\emptyset \rightarrow \quad (pl\tilde{\alpha}t,+j+\ddot{u}) \]

**PEKU**: \((\langle pek+e\rangle+m)\)

**PRE-CYCLE**: \((\langle pek+e\rangle+m) \quad -V:0 \rightarrow \quad (pek+o)+m) \]

**FIRST CYCLE**: \((pek+o) \rightarrow C:C, \rightarrow \quad (p,ek+o) \]

**SECOND CYCLE**: \((p,ek+o+m) \quad -VN\rightarrow \quad (p,ek+\ddot{u}+m) \rightarrow N:\emptyset \rightarrow \)

\[ (p,ek+\ddot{u}) \]
PEKUT: ((pek+e)+n+t)

PRE-CYCLE: ((pek+e)+n+t) →V:O→ ((pek+o)+n+t)
FIRST CYCLE: (pek+o) →C:C,→ (p,ek+o)
SECOND CYCLE: (p,ek+o+n+t) →VN→ (p,ek+u+n+t)
→S:∅→ (p,ek+u+t)

Although we do not give detailed consideration to the order of application of phonological rules until Chapter XIII, we shall discuss here, briefly, the nature of rule (V:O). This rule is the only pre-cycle rule which we shall propose, and for this reason, the correctness of the rule might be subject to doubt. Actually, however, the rule is no different from a rule which specifies, say, nom. sg. as o for a neuter noun, o for a feminine noun; this rule also must be a pre-cycle rule and must apply across a constituent boundary. Rule (V:O) applies only in 1 sg. and 3 pl. and hence should be considered a supplementary device for specifying the present tense theme. We can say that the present theme is I after verb stems in a front vowel, e elsewhere. Rule (V:O) will then derive a -T, grave present theme before 1 sg. and first conjugation 3 pl.

Further evidence for the correctness of this solution may be derived from the fact that no other solution seems reasonable. Thus, consider the 1 sg. and 3 pl. of velar stems; in these forms the velar always remains intact (PEKU, PEKUT), although elsewhere the strident palatal appears (PEOES, PEOET etc.). If we posit a straightforward representation such as 1 sg. ou or om, 3 pl. ou+t or on+t, then we would be forced to
impose a complicated restriction on the application of \((k: \xi)\) to prevent its first cycle application to the pres. stem \((pek+e)\) in 1 sg. and 3 pl.

6. We now consider the problem of specifying the redundant features of compactness and flatness of vowels which undergo \((VN)\).

6.1 Compactness. It will be seen that if \((VN)\) applies after \((V\text{reund-c})\) of page 31, the compactness of some vowels undergoing \((VN)\) will be incorrectly specified:

\[
\begin{align*}
\text{iNC} & \rightarrow \text{Vreund-a,b,c} & \text{i NC} & \rightarrow \text{VN} & \overline{\text{\textbullet}} & \text{NC} & \text{[-comp]} \\
\text{oNC} & \rightarrow \text{Vreund-a,b,c} & \text{\textbullet} & \text{NC} & \rightarrow \text{VN} & \overline{\text{\textbullet}} & \text{NC} & \text{[+comp]}
\end{align*}
\]

Application of \((VN)\) before \((V\text{reund-c})\), however, permits us to avoid formulating an extra rule to specify compactness in these vowels:

\[
\begin{align*}
\text{iNC} & \rightarrow \text{VN} & \text{\overline{\text{NC}}} \rightarrow \text{Vreund-c} & \overline{\text{\textbullet}} & \text{NC} & \text{[+comp]} \\
\text{oNC} & \rightarrow \text{VN} & \text{\overline{\text{\textbullet}}} \rightarrow \text{Vreund-c} & \overline{\text{\textbullet}} & \text{NC} & \text{[-comp]}
\end{align*}
\]

6.2 Flatness. It is necessary that \(\overline{\text{\textbullet}}\) resulting from a back before \(N\{C, \#\}\) be specified \text{+flat} in order not to derive the phonetically incorrect vowel \(\text{*[\text{	extgamma}]}.\) For this reason we will modify our earlier formulation of \((VN)\) in the following manner:
(VN) \[
\begin{array}{c}
\text{+[vocal]} \\
\text{-[cons]} \\
\text{[<grave]} \\
\text{[-flat]} \\
\text{[<diff]} \\
\text{[-T]}
\end{array}
\] / N \{C\} #

If we now consider the relative order of (Vredund-a) with respect to (VN), we see that (VN) must follow (Vredund-a):

\[\delta\text{NC} \rightarrow \text{Vredund-a} \rightarrow \text{\(\ddot{\text{n}}\text{c}\)} \rightarrow \text{Vredund-b} \rightarrow \text{inapplicable}\]

\[-\text{VN} \rightarrow \text{\(\ddot{\text{u}}\) NC} \rightarrow \text{Vredund-a} \rightarrow \text{[+flat]} \rightarrow \text{[+T]} \rightarrow \text{[<diff]} \rightarrow \text{[-flat]} \rightarrow \text{[C]} \rightarrow \text{#} \]

With the reverse order of application, we would derive

\[\delta\text{NC} \rightarrow \text{VN} \rightarrow \text{\(\ddot{\text{u}}\) NC} \rightarrow \text{Vredund-a} \rightarrow \text{* \(\ddot{\text{y}}\) NC} \rightarrow \text{[+flat]} \rightarrow \text{[<diff]} \rightarrow \text{[-flat]} \rightarrow \text{[C]} \rightarrow \text{#} \]

In the derivations of the inf. and past tense forms of BYT', the root vowel \(\ddot{\text{u}}\) does not lie before NC and results in phonetic [\(\ddot{\text{y}}\)]; in pres. tense forms, however, the root vowel \(\ddot{\text{u}}\) does lie before NC (cf. p. 56) and hence results in the phonetic rounded vowel [\(\ddot{\text{u}}\)]. The derivations of femm. past and 3 sg. pres. are as follows:

BYLA: b\(\ddot{\text{u}}\)d+1+\(\ddot{\text{a}}\) \rightarrow \text{Vredund-a} \rightarrow b\(\ddot{\text{y}}\)d+1+\(\dd\text{a}\) \rightarrow \text{Vredund-b} \rightarrow \text{[<flat]} \rightarrow \text{[<diff]} \rightarrow \text{[-flat]} \rightarrow \text{[<comp]} \rightarrow \text{[C]} \rightarrow \text{#} \rightarrow \text{d1:1}\text{0} \rightarrow b\(\dd\text{y}\)+1+\(\dd\text{a}\)

\[\text{10Cf. APPENDIX III.}\]
BUDET: bÜNd+e+t →C:C, bÜN,d,+e+t →Vredund-a,b
   b ü Ñ, d, +e+t →VN- b Õ N, d, +e+t →Vredund-c
   [+flat]       [+flat]

b ü N, d, +e+t →e:o→ bÜN,d,+o+t →S:θ→ bûd,+o+t
   [+flat]       [-comp]

7. The introduction of (VN) into the grammar presents a problem of indeterminacy in the analysis of a large number of forms. Phonetic [â] after a sharp non-palatal consonant is derived from a front vowel followed by a nasal;¹¹ phonetic [u] after a non-sharp, non-palatal consonant, on the other hand, may be derived either from an underlying back vowel followed by a nasal or from the cluster ou.¹² In the forms already presented (ZVUK, TRUSIT' etc. and KUJU, TORJUET etc.) no indeterminacy could arise because the underlying morphemes either showed an u : on alternation (ZVUK : ZVON) or an a : u alternation (TRJASTI : TRUSIT') or an ov : u alternation (KOVAT' : KUJU). The morphemes underlying forms like DRUG 'friend', DUB 'oak tree', LUG 'meadow' etc., however, always show phonetic [u], and we have no means of deciding whether this [u] should be derived from ou or from a back vowel followed by a nasal. Thus the forms of DRUG could be derived from an underlying root morpheme droug or drUNG. Throughout the remainder of the thesis we make the arbitrary decision

¹¹Other sources treated in APPENDIX I.

¹²After a sharp consonant or a palatal, phonetic [u] may be derived only from an underlying eu, as in KLJUET, ŽUET.
of deriving phonetic [u] from ou in all cases except those where one must clearly postulate a back vowel followed by nasal.

8. The Suffix -NU-.

For this suffix we may postulate either an underlying nou or an underlying non. There are difficulties inherent in both solutions. Consider the forms MOKNUT', MOKNET 'become wet', for example. If we postulate either nou or non, the inf. form is immediately derivable. With neither formulation, however, can we derive the pres. forms; from the representation ((mok+nou+e)+t), rule (u:w) will apply on the first cycle to give *(mok+nou+e). From the representation ((mok+non+e)+t), we would ultimately derive the incorrect phonetic representation *[mok-nən, it].

The solution to this problem was suggested to me by Morris Halle. If we consider the underlying representation of the suffix -NU- to be bimorphemic, we can then postulate that the second morpheme never appears in pres. tense forms; 3 sg. MOKNET is thus derived from ((mok+n+e)+t). The question as to the segmental constitution of the second morpheme of this suffix still remains, however. Thus we could derive inf. MOKNUT' either from (mok+n+on+t,) or from (mok+n+ou+t,). In conformity with our ad hoc decision to derive all instances of [u] from ou when there is no clear motivation for postulating a nasal, we shall assume that n+ou is the underlying representation of the suffix -NU-.

B.C. Hall, in an unpublished paper, has suggested that one might find a motivation for postulating ou (rather than on) for this morpheme
by considering deverbals like ISCEZNovenIE 'disappearance' to be derived from the corresponding -NUT' verbs, in this case from the verb ISCEZNUT' 'to disappear'.

We give below the list of nouns in -OVENIE, and beside them the corresponding verb in -NUT', if one exists:

VDOXNOVENIE 'inspiration' - VDOXNUT' 'to inspire'
VOZNIKNOVENIE 'origin' - VOZNIKNUT' 'to arise, spring up'
DERZNOVENIE 'daring' - DERZNUT' 'to dare'
DUNOVENIE 'wiff, puff' - DUNUT' 'to blow'
ISCEZNovenIE 'habit' - ISCEZNUT' 'to disappear'
OBYKNOVENIE 'habit' (no verb)
OTDOXNOVENIE 'repose' - OTDOXNUT' 'to rest'
POMINOVENIE 'mention' - POMJANUT' 'to mention'
POPOLZNOVENIE 'feeble impulse' (no verb)
PRETKNOVENIE 'stumbling' - PRETKNUT'SJA 'to stumble'
PRIKOSNOVENIE 'touch' - PRIKOSNUT'SJA 'to touch'
SOPRIKOSNOVENIE 'contact, contiguity' - SOPRIKOSNUT'SJA 'to be contiguous to, adjoin'
STOLKNOVENIE 'collision' - STOLKNUT'SJA 'to collide'
UPOMINOVENIE 'reference, mention' - UPOMJANUT' 'to refer to, mention'
USEKNOVENIE 'cutting off, severance' - USEKNUT' 'to cut off, sever'

It can be seen that for the majority of nouns in -OVENIE there do exist corresponding verbs in -NUT', and that in most of the pairs the noun in -OVENIE is semantically the deverbal from the corresponding -NUT' verb. Deverbal substantives in -IE, however, are generally built from the past passive participle (henceforth ppp) stem: PODPISAT' -
PODPISAN - PODPISANIE; VZJAT' - VZJAT - VZJATIE; PRIGOTOVIT' - PRIGOTOVLENI
- PRIGOTOVLENI; RASSMOTRET' - RASSMOTREN - RASSMOTRENIE;
RAZLIT' - RAZLIT - RAZLITIE etc. Verbs in -NUT' (STOLKNUT' - STOLKNUT; OBRMANUT' - OBRMANUT etc.), and
the deverbals in -NOVENIE are obviously not built on these ppp stems;
On the other hand, there are no nouns in -NUTIE, so that no verbs in
-NUT' form substantives from their ppp stems; the forms in -NOVENIE,
therefore, might well be considered a deverbal formation peculiar to
these verbs. The underlying representation of PRIKOSNOVENIE, e.g.,
would then be
\[ M(\text{NS}(\text{en}) + \text{PPP} S + \text{Ij})_{\text{NS}} + \text{O})_{\text{N}} \]
where en represents the ppp morpheme (the same morpheme found in PRI-
GOTOVLEN, PEREVEDEN etc.), Ij represents the substantive suffix, and o
the nom. sg. ending. The substantives POMINOVENIE, UPOMINOVENIE, how-
ever, are clearly derived from a root which has undergone application
of rule (V:V) (i.e., from the DI root m\(\text{m}n\)), and not from the root min
which is found in the verbs (U)POMJANUT'. Although a deeper morpho-
logical analysis of the substantives in -NOVENIE is required before any
final decision can be reached, the postulation of n+ou seems preferable
to the postulation of n+on. If the analysis of the -NOVENIE substan-
tives tentatively proposed here is correct, then the suffix must be con-
sidered n+ou; if the -NOVENIE analysis is wrong, then further evidence
might lead one to consider the suffix n+on, but it might also lead one to
consider the suffix n+ou.

On page 65 we mentioned that the second morpheme of the
suffix n+ou does not appear in pres. tense forms of -NUT' verbs.
We mention here a class of verbs which show a similar behavior in
their pres. tense forms, even though these verbs are not related to the major topic of discussion, rule (VN).

Verbs with the suffix ð whose roots contain a lax, diffuse vowel fail to undergo (v; j): BRAT' - 1 sg. BERU (for the expected *BERJU); DRAT' - 1 sg. DERU; ŽDAT' - 1 sg. ŽDU; ŽRAT' - 1 sg. ŽRU; SRAT' - 1 sg. SERU; ZVAT' - 1 sg. ZOVU etc.\(^\text{13}\) These verbs will be marked as dropping the verb suffix in pres. Thus the pres. of DRAT', say, will be derived from ((dir+e+X), and not from *((dir+ê+e)+X), where X represents the person-number endings. The verb STLJAT' (1 sg. STELJU) is an exception: it retains the verb suffix ð in pres: ((stlj+ê+e)+X).\(^\text{14}\)

\(^{13}\) Also the verbs SOSAT' (1 sg. SOSU) 'to suck', STONAT' (1 sg. STONU) 'to groan', and (optionally) ORAT' (1 sg. ORU : ORJU) 'to shout' (cf. V.2 fn. 5).

\(^{14}\) The verbs SPAT' 'to sleep' and GNAT' 'to drive, turn out' do not belong here. These verbs use the verb suffix ð in inf. and past tense, [ê, i] in pres. tense (1 sg. SPLJU, GONJU, 3 sg. SPIT, GONIT). Verbs like MOAT' 'to rush, whirl along' use the verb suffix ê (cf. APPENDIX I).
APPENDIX I. The Origin of a after P(alatalized or palatal consonant.

1. Verbs with Infinitive in -Pat.
1.1 We have already discussed (pp. 23-24 et passim) verbs like MJAT', ŽAT'. In these verbs a is derived from a front vowel followed by N+C.

1.2 Second conjugation verbs with inf. in -at, are preceded only by palatals: VIZŽAT' (3 sg. VIZŽIT) 'to squeal', KRIČAT' (3 sg. KRIČIT) 'to shout', SLYŠAT' (3 sg. SLYŠIT) 'to hear', STOJAT' (3 sg. STOIT) 'to stand' etc. These verbs are derived with the help of the verb suffix e, which undergoes application of the following rule:

\[(\varepsilon:\varepsilon) \overset{\varepsilon}{\longrightarrow} \overset{-\text{grave}}{\varepsilon} \quad / \quad \overset{\text{+compact}}{\varepsilon}\]

The derivation of inf. KRIČAT':

krīk+ē+t, \overset{\varepsilon}{\longrightarrow} krīč+ē+t, \overset{-\text{C}:\text{C}}{\longrightarrow} k,r,ǐč,+e+t,
\overset{\varepsilon:\varepsilon}{\longrightarrow} k,r,ǐč,+ biased+t,

We shall not discuss rule (e:ö) in greater detail, except to point out that Pa in forms like ŽAR 'heat', ĈAS 'hour', ŠAG 'step' etc. may be derived from velar-ē clusters:

\[1\text{For further discussion of (e:ö), see Halle, "O pravilax," and Lightner, "O cikličeskix pravilax."} \]
ŽAR: gēr →(k:č) and (C:C,)-> žër →ēːo→ ž,ōr
ČAS: kēs →(k:č) and (C:C,)-> čēs →ēːo→ č,ōs
ŠAG: xēg →(k:č) and (C:C,)-> šēg →ēːo→ š,ōg

1.3 Imperfectives in -PAT'.

1.3.1 DI's like UTVERŽDAT' (pf. UTVERDIT') 'to affirm', VO-
OBRAŽAT' (pf. VOOBRAZIT') 'to imagine', OTVEČAT' (pf. OTVETI-
T') 'to answer', UKRAŠAT' (pf. UKRASIT') 'to adorn', POXVALJA-
T'SJA (pf. POXVALIT'SJA) 'to boast, brag', UPODOBLJAT' (pf.
UPODOBIT') 'to liken to; assimilate to [ling.], PRIBAVLJAT'
(pf. PRIBAVIT') 'to add', OKAJMLJAT' (pf. OKAJMIT') 'to border,
edge, fringe (with)', ZAKREPLJAT' (pf. ZAKREPIT') 'to fasten,
secure', RAZGRAFLJAT' (pf. RAZGRAFIT') 'to rule (in squares,
columns etc.)', OTSTRANJAT' (pf. OTSTRANIT') 'to push aside',
UMUDRJAT' (pf. UMUDRIT') 'to make wise(r)', UGOŠČAT' (pf. U-
GOSTIT') 'to entertain, treat' etc. are all derived with the
help of the suffix ơ preceded by the imperfectivizing suf-
fix ĭ; consonants preceding the suffix ĭ undergo both trans-
itive and non-transitive softening: UGOŠČAT' from (ou#gost+i+
Ơj+t,)DI, for example.

1.3.2 Primary imperfectives with inf. in -PAT' can be divid-
ed into two groups: those in which P is a palatal, and those
in which P is a sharp, non-palatal.

1.3.2.1 We give below a list of verbs with inf. in -PAT', where
P is a palatal; these verbs are all first conjugation verbs and
are not of the type discussed in 1.2 above. For convenience in the discussion given below we have given in parentheses some related forms beside a few of these verbs; comments in square brackets are taken from Ušakov's dictionary.

SAŽAT' 'to give/offer smb. a seat' (pf. POSADIT')

DOLŽAT' 'to borrow' (cf. DOILG 'debt')

ROŽAT' [PROSTOREČ.] 'to give birth, bear' (= RODIT' 'to give birth/raise to')

DOROŽAT' 'to rise in price' (cf. DOROGOJ 'expensive')

MUŽAT' 'to reach manhood' (cf. MUŽ 'husband; man')

PUŽAT' [OBL.] = PUGAT' 'to frighten, intimidate'

KAŽAT' 'to rock, swing, roll'

LEGČAT' 'to become milder, abate' (cf. LEGKIJ 'easy, light')

TAČAT' 'to stitch'

DIČAT' 'to run/become/grow wild' (cf. DIKIJ 'wild')

VENČAT' 'to crown' (cf. VENEC 'crown')

KONČAT' 'to finish' (cf. KONEC 'end')

TONČAT' 'to become thin(ner)' (cf. TONKIJ 'thin')

VOROČAT' 'to move, shift, turn; have control of, be boss of, be in command of' (cf. VOROTIT' 'to turn; have control of, be boss of, be in command of')

KREPČAT' 'to grow stronger' (cf. KREPKIJ 'strong')

SERČAT' [PROSTOREČ.] 'to be angry'

MUČAT' = MUČIT' 'to torment' (cf. MUKA 'torment')

VEŠAT' 'to hang' (pf. POVESIT')

TIŠAT' 'to become quieter' (cf. TIXIJ 'quiet')

MELČAT' 'to become/grow small(er)'
MEŠAT' 'to prevent, hinder; to stir, agitate'
RESAT' 'to decide'
LIŠAT' 'to rob, deprive of'
PLOŠAT' 'to make a mistake; to become worse' (cf. PLOXOJ 'bad')
VETŠAT' 'to fall into decay, become dilapidated' (cf. VETXIJ
'decrepit, dilapidated')
KUŠAT' 'to eat'
SLUŠAT' 'to listen' (cf. SLUX 'hearing')
VNUŠAT' 'to suggest, inspire with' (cf. UXO 'ear')
PUSŠAT' [OBL.] = PUSKAT' 'to let (go)'
STRASŠAT' 'to frighten, scare'
VRAŠCOT' 'to revolve, rotate, turn'
VESČAT' 'to prophesy'
NIŠČAT' 'to grow poor'
PROŠCAT' 'to forgive' (pf. PROSTIT')

The de-adjectivals like VETŠAT', LEGČAT', DIČAT', DO-
ROŠAT' etc. are derived with the help of the verb suffix ĕ́: ắ:

DIČAT': dīk+ēj+t, →k:č→ dīč+ēj+t, →c:č→ d,īč,+ēj+t,
→ē:ō→ d,īč,+ōj+t, →S:ō→ d,īč,+ō+t,

When non-velars precede the de-adjectival verb suffix ĕ́, rule
(ē:ō) is inapplicable; thus GRUBET' 'to become coarse' (cf. GRU-
BYJ 'coarse'), TREZVET' 'to become sober' (cf. TREZYJJ 'sober'),
MOLODET' 'to look younger, grow young again' (cf. MOLODOJ 'young'),
SIZET' 'to become grey' (cf. SIZYJJ 'grey'), TEPLET' 'to grow
warm' (cf. TEPLYJJ 'warm'), NEMET' 'to become dumb, mute' (cf.
NEMOJ 'dumb, mute'), KRASNET' 'to grow red; blush' (cf. KRASNYJJ
'red'), GLUPET' 'to become/grow foolish' (cf. GLUPYJ 'foolish'), DOBRET' 'to become kinder' (cf. DOBRYJ 'kind'), LYSET' 'to grow bald' (cf. LYSYJ 'bald'), BOGATET' 'to grow rich' (cf. BOGATYJ 'rich') etc.

The remaining imperfectives, like the DI's discussed in 1.3.1, will be derived with the help of the suffixes 1-öJ. Thus PROŠČAT' from (prost+1-öj+t,), KONČAT' from (kon+1k+1-öj +t,) etc.

In addition to verbs like those given above, there are a large number of verbs in -NIČAT' (3 pl. in -NIČAJUT):

BABNIČAT' 'to be a ladies' man' (cf. BABNIK 'ladies' man')
ŽADNIČAT' 'to be stingy'
DARMOEDNIČAT' 'to idle, loaf'
EXIDNIČAT' 'to speak maliciously'
VAŽNIČAT' 'to put on airs'
BRAŽNIČAT' 'to carouse, revel' (cf. BRAŽNIK 'reveller')
BRODJAZNIČAT' 'to be on the tramp' (cf. BRODJAGA 'tramp')
OZORNİČAT' 'to be naughty' (cf. OZORNIK 'mischievous child')
BEZDELNIČAT' 'to idle, loaf' (cf. BEZDELNIK 'idler, loafer')
KRAMOLNIČAT' 'to rise in revolt/revolution' (cf. KRAMOLNIK 'seditionary')
BOGOXULNIČAT' 'to blaspheme' (cf. BOGOXULNIK 'blasphemer')
SAPOŽNIČAT' 'to be a shoemaker' (cf. SAPOZNIK 'shoemaker')
MODNIČAT' 'to follow the fashion, dress in the latest fashion' (cf. MODNIK 'dandy, man of fashion')

etc.
From the above list (which may be completed by referring to an a tergo dictionary), one can see (1) that nouns in -NIK frequently (but not always) occur alongside verbs in -NIČAT', (2) that ŭ before -NIČAT' is always sharp, and (3) that underlying velars before -NIČAT' are always replaced by the corresponding strident palatals. We will account for these facts by deriving the verbs in -NIČAT' from noun stems underlying nouns in -NIK. The suffix -NIK is represented by the morphemes in+iš, and the verb suffix in -NIČAT' is ĕj. Thus the derivation of BEZDEL'NIČAT', for example, will be as follows:

bēz#dĕj+l+in+iš+ĕj+t,  -k:ĕ¬  bēz#dĕj+l+in+ič+ĕj+t,
                -c:c¬  b,ĕz,#d,ĕj+l,+in,+ič,+ĕj+t,  -ĕ:ĕ¬
                         b,ĕz,#d,ĕj+l,+in,+ič,+ĕj+t,  -u:ĕ¬
                           bēz,#d,ĕj+l,+n+ič,+ĕj+t,
                                  -s:ĕ¬  b,ĕz,#d,ĕj+l,+n,+ič,+ĕj+t,

1.3.2.2 The following is a list of primary imperfectives in -PAT', where P is a sharp, non-palatal. Note that for P only the sonorants m, n, r, l are permitted (never the obstruents t, d, g, z, p, b, f, v, k, s, x):

VALJAT' 'to drag along'
PUDELJAT' 'to shoot past, miss [hunting]'
ŠEPELJAT' [OBL.] 'to lisp'
STRELJAT' 'to shoot, fire (at)'
VILJAT' 'to wag'
ŠČEGOLJAT' 'to be a dandy' (cf. ŠČEGOL' 'dandy')
GULJAT' 'to go for/take a walk'
PETLJAT' 'to stray, go in circles [PETLJAMI]' (cf. PETLJA 'loop')
PULJAT' [PROSTORČ., OBL.] 'to throw (smth. at smb.)'
VIXLJAT' 'to reel'
KAŠLJAT' 'to cough' (cf. KAŠEL' 'cough')
KOVYLJAT' 'to hobble'
KOSTYŁJAT' 'to beat, strike'
RAVNJAT' 'to make even, equalize'
ROVNJAT' 'to even'
PENJAT' 'to reproach, blame'
LINJAT' 'to fade'
VONJAT' 'to stink (of)' (cf. VON' 'stink, stench')
RONJAT' 'to drop, let fall'
ŠČUNJAT' [PROSTORČ., OBL.] 'to reprimand, rebuke'
ŠPYNJAT' 'to nag'
MERJAT' 'to measure'
TERJAT' 'to lose'
VEČERJAT' 'to have supper' (cf. VEČER 'evening')
ŠIRJAT' [KNIŽ. USTAR.] 'to flap [of wings outstretched]'
FIGURJAT' 'to flaunt, parade, show off'
KOVRJRJAT' 'to peck'
ŠVYRJAT' 'to fling, hurl, toss'
KOZJRJAT' 'to trump' (cf. KOZJR' 'trump')
NYRJAT' 'to dive'
ŠNYRJAT' 'to poke about'

Some of these verbs (KOZJRJAT', PETLJAT', ŠČEĐOLJAT', e.g.) may be derived from underlying noun stems with a final sharp consonant (cf. XI.1), but the majority are primary verbs.
These imperfectives, like the DI's discussed in 1.3.1, use the suffixes ı+5ı; thus LİNJAT', e.g., from (lın+i+5ı+t,).

2. Present Gerund.

The pres. gerund is represented by NC added to the pres. stem: ZNAJA 'knowing' from ((znı5ı+e)+NC), PLATJA 'paying' from ((plı5ı+t+ı)+NC), PLAČA 'crying' from ((plı3ı+ı+e)+NC), XLEŠĆA 'lashing' from ((xlest+ı+5ı+e)+NC), STRAXUJA 'insuring' from ((strı5ı+ou+ı+5ı+e)+NC), TERPJAJA 'enduring' from ((tirp+ı+ı+ı)+NC) (cf. VI.7), NESJA 'carrying' from ((nes+ı+ı+ı)+NC), KRIĆA 'shouting' from ((kric+ı+ı+ı)+NC) etc. Many verbs do not form present gerunds: verbs with velar stems (PEČ', MOČ'), most verbs from roots with a lax, diffuse vowel (SlAT', ZDAT', ŽAT' etc.); for details see Isachenko, Grammatičeskij stroj russkogo jazyka, pp. 523-525. See p. 179 for the derivation of LĖŽA 'lying'.


Forms like SLOVARJA 'dictionary (gen. sg.)', ZARJA 'dawn; sunset (nom. sg.)', MORJA 'sea (nom. pl.)' etc. add ȍ to a noun stem whose final consonant is sharp (cf. XI.1): ((slou+ır,)+ȍ), ((zōr,)+ȍ), ((mor,)+ȍ) etc.

APPENDIX II. The Verb -NJAT'.

This verb occurs only with a prefix (PONJAT', SNJAT' etc.) and is irregular. We give a representative list of the perf. inf., 3 sg. perf. fut., and DI forms of this verb:
(i) DONJAT'  DOJMET  DONIMAT'
    ZANJAT'  ZAJMET  ZANIMAT'
    NANJAT'  NAJMET  NANIMAT'
    PONJAT'  POJMET  PONIMAT'
    PRONJAT'  PROJMET  PRONIMAT'
    UNJAT'  UJMET  UNIMAT'

(ii) OBNJAT'  OBNIMET  OBNIMAT'
       OTNJAT'  OTNIMET  OTNIMAT'
       PODNJAT'  PODNIMET  PODNIMAT'
       RAZNJAT'  RAZNIMET  RAZNIMAT'
       SNJAT'  SNIMET  SNIMAT'

The verbs of type (ii) all have alternate forms which we list below:

(iii) OB"JAT'  OBYMET  OBYMAT'
     OT"JAT'  OTYMET  OTYMAT'
     POD"JAT'  PODYMET  PODYMAT'
     RAZ"JAT'  RAZYMET  RAZYMAT'
     S"JAT'  SYMET  SYMAT'

Ušakov marks the perf. inf. and past of these forms [KNIŽN. RITOR. USTAR.] and the perf. fut. and DI's [PROSTOREČ.]

(iv) In addition to the regular 3 sg. pres. in -AET, some of the DI's given in (i)-(iii) have alternate forms in -EMLET; Ušakov marks the alternate forms [KNIŽN. USTAR.].

    OBNIMAT'  OB"EMLET
    OTNIMAT'  OT"EMLET
PODNIMAT'  POD"EMLET
PRINIMAT'  PRIEMLET
RAZYMAT'  RAZ"EMLET

The major difficulty in describing these forms is to account for the presence/absence of н. The verbs given in (i) and (ii)—the "regular" forms—always show н in DI and in perf. forms when the prefix ends in у or the endings begin with a consonant: DI PONIMAT'; perf. inf. PONJAT'; perf. fut. OTNIMET (prefix from оту), but POJMET (prefix по). For lack of a more revealing explanation, we shall assume that н is inserted in these environments by application of a special rule.2 We posit jîm as the root (njîm with the epenthetic н).3 The derivation of a typical set of forms is thus as follows:

PONJAT': po#njîm+t, →C:C,→ po#n,jîm+t, →VN→ po#n,jî+t,

2If the verb VNUŠAT'/VNUŠIT' 'to suggest, inspire' is derived from the root which occurs in UXO 'ear', н must be inserted here as well. This insertion of н is restricted to certain morphemes (cf. insertion of N in pres. tense forms of BYT', LEČ', SEST', but not of other verbs). An н insertion also occurs when a third person pronoun is object of a preposition: OT NEGO/NEE/NIX 'from him (it)/her (it)/them' (cf. OT EGO/EE/IX DRUGA 'from his/her/their friend' and JA VIDEL EGO/EE/NX 'I saw him (it)/her (it)/them', where no insertion occurs).

3In APPENDIX III to Chapter VI we shall show that the 1 is
POJMET: \((po\#jim+e)+t\)

**FIRST CYCLE:** \((po\#jim+e)\) \(-u:o\rightarrow (po\#jim,+e)\)

**SECOND CYCLE:** \((po\#jim,+e+t)\) \(-u:o\rightarrow (po\#jim,+e+t)\)

**PONIMAT':** \((po\#njim+o,j+t,)\) \(-v:V\rightarrow (po\#njim+o,j+t,)\)

\(-c:c\rightarrow (po\#n,jim+o,j+t,)
\(-s:o\rightarrow (po\#n,jim+o+t,\)

Another peculiarity of these verbs is the presence of \(i\) in perf. fut. forms like SNIMET. Apparently these forms are exceptional in undergoing application of \((V:V)\); the derivation of SNIMET is thus as follows:

SNIMET: \((su\#njim+e)+t\)

**FIRST CYCLE:** \((su\#njim+e)\) \(-v:V\rightarrow (su\#njim+e)\)

**SECOND CYCLE:** \((su\#n,jim,+e+t)\) \(-u:o\rightarrow (su\#n,jim,+e+t)\)

\(-e:o\rightarrow (su\#n,jim+o+t)\)

In the derivations of PONJAT', PONIMAT', and SNIMET, a rule which we given in V.1 will drop the \(i\):

predictable and that the root is simply \(im\).

Although the stress pattern is different in type (ii) and type (i) verbs, this fact does not seem to be related to the tensing of the root vowel in type (ii) verbs; the 1 sg. of these verbs all stress the ending: OBNIMÚ, OTNIMÚ, PODNIMÚ, RAZNIMÚ, SNIMÚ etc.
PONJAT': po#n, jō+t, → j:∅→ po#n, ń+t,

PONIMAT': po#n, jīm+ń+t, → j:∅→ po#n, ĕm+ń+t,

SNIMET: s#n, jīm,+o+t → j:∅→ s#n, ĕm,+o+t

The forms of this verb with the prefix VZ- show a further exception in not taking the epenthetic n. Inf. VZJAT', 3 sg. VOZ'MET are thus derived as follows:

VZJAT': vuz+jim+t, → C:C,→ vuz,#jim+t, → VN→

vuz,#jōm+t, → j:∅→ vuz,#ōm+t, → u:∅→ vz,#ōm+t,
→ S:∅→ vz,#ō+t,

VOZ'MET: ((vuz#jim+e)+t)

FIRST CYCLE: (vuz#jim+e) → u:∅→ (voz#jim+e) → C:C,→

(voz,#jim,+e) → j:∅→ (voz,#im,+e)

SECOND CYCLE: (voz,#im,+e+t) → u:∅→ (voz,#m,+e+t)
→ e:o→ (voz,#m,+o+t)

The perf. fut. forms PRIMU, PRIMES' etc. drop the root j (cf. NAJMU, NAJMEŠ' etc.). The dropping of j is also found in the verb PRIJTI, 3 sg. PRIDET.

APPENDIX III. Rules governing consonant truncation/mutation.

We give below some representative forms which show consonant truncation/mutation in past tense and/or infinitive:

5 Pronounced [pr,ıt,t,i] in spite of the spelling; see Avanesov, Russkoe literaturnoe proiznoшение i udarenie, p. 446.
<table>
<thead>
<tr>
<th>inf.</th>
<th>past</th>
<th>3 pl.</th>
<th>root</th>
<th>final</th>
<th>consonant</th>
</tr>
</thead>
<tbody>
<tr>
<td>VESTÍ</td>
<td>VĚL, VELÁ</td>
<td>VEDÚT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KLÁST'</td>
<td>KLÁL, KLÁLA</td>
<td>Kladút</td>
<td>d</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRJÁST'</td>
<td>PRJÁL, PRJALÁ</td>
<td>PRJADÚT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MESTÍ</td>
<td>MĚL, MELÁ</td>
<td>METÚT</td>
<td>t</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLESTÍ</td>
<td>PLĚL, PLELÁ</td>
<td>PLETÚT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NESTÍ</td>
<td>NĚS, NESLÁ</td>
<td>NESÚT</td>
<td>s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PASTÍ</td>
<td>PÁS, PASLÁ</td>
<td>PASÚT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VEZTÍ</td>
<td>VĚZ, VEZLÁ</td>
<td>VEZÚT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LÉZT'</td>
<td>LÉZ, LÉZLA</td>
<td>LÉZÚT</td>
<td>z</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISCÉZNUT'</td>
<td>ISCÉZ, ISCÉZLA</td>
<td>ISCÉZNUT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SKRESTÍ</td>
<td>SKŘĚB, SKREBLÁ</td>
<td>SKREBÚT</td>
<td>b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POGÍBNUT'</td>
<td>POGÍB, POGÍBLÁ</td>
<td>POGÍBNUT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSLÉPNUT'</td>
<td>OSLÉP, OSLÉPLA</td>
<td>OSLÉPNUT</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PÉČ'</td>
<td>PĚK, PEKLÁ</td>
<td>PEKÚT</td>
<td>k</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MÓKNUT'</td>
<td>MÓK, MÓKLA</td>
<td>MÓKNÚT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OGLÓXNUT'</td>
<td>OGLÓX, OGLÓXLA</td>
<td>OGLÓXNUT</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TERÉT'</td>
<td>TĚR, TĚRLA</td>
<td>TRÚT</td>
<td>r</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Consider first the past tense forms. As can be seen from the above table, dental stops drop before 1, and then 1 drops in word final position after a consonant. Comparison of these past tense forms with the adjective forms given below
shows that these constraints on the occurrence of \( c+1 \) clusters are restricted to past tense forms (note that the \( l \) in the adjectives is suffixal and does not belong to the root):

<table>
<thead>
<tr>
<th>adjective</th>
<th>masc. short</th>
<th>gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRJABLYJ</td>
<td>DRJABL</td>
<td>'withered' (cf. DRJABNUT 'to wither')</td>
</tr>
<tr>
<td>KRUGLYJ</td>
<td>KRUGL</td>
<td>'round' (cf. KRUG 'circle')</td>
</tr>
<tr>
<td>PODLYJ</td>
<td>PODL</td>
<td>'mean, vile'</td>
</tr>
<tr>
<td>ZAKORUZLYJ</td>
<td>ZAKORUZL</td>
<td>'shrivelled'</td>
</tr>
<tr>
<td>BLEKLYJ</td>
<td>BLEKL</td>
<td>'faded' (cf. BLEKNUT 'to fade')</td>
</tr>
<tr>
<td>XRIPLYJ</td>
<td>XRIPL</td>
<td>'hoarse' (cf. XRIPOTA 'hoarseness')</td>
</tr>
<tr>
<td>ODUTLYJ</td>
<td>ODUTL</td>
<td>'puffy, swollen, bloated'</td>
</tr>
<tr>
<td>PUXLYJ</td>
<td>PUXL</td>
<td>'swollen' (cf. PUXNUT 'to swell')</td>
</tr>
</tbody>
</table>

Past tense forms are derived from past tense stems (PS), PISALA from \( V( p_S(p_S(p_S+p_S+1)_S+5)_V \), LJUBIL from \( V( p_S(l_S(u_S+1)_S+u)_V \) etc.; the following two rules account for consonant truncation in past tense forms on the basis of their constituent structure:

\[
(dl: l) \left[ +\text{obstr} \atop \text{-grave} \atop \text{-contin} \right] \rightarrow \emptyset / \_{l} p_S
\]

\[
(l: \emptyset) \ \_{l} \rightarrow \emptyset / c \_{V}
\]

The derivations of VEL 'he led', MOG 'he could', MOGLA 'she could', and BLEKL 'faded', for example, are as follows (note
that \((l:\emptyset)\) must apply after \((u:\emptyset)):\n
\[
\text{VEL: } V(ps(ued+1)ps + u)_V
\]

**FIRST CYCLE:**
\[
ps(ued+1)ps \quad -u:w \rightarrow \quad ps(wed+1)ps
\]
\[
-c:o, -dl:1 \rightarrow \quad ps(w,ed+1)ps \quad -e:o \rightarrow \quad ps(w,od+1)ps
\]

**SECOND CYCLE:**
\[
V(w,o+1+u)_V \quad -u:\emptyset \rightarrow \quad V(w,o+1)_V
\]
\[
-l:\emptyset \rightarrow \quad \text{inapplicable}
\]

\[
\text{MOG: } V(ps(mog+1)ps + u)_V
\]

**FIRST CYCLE:**
\[
ps(mog+1)ps \quad -dl:1 \rightarrow \quad \text{inapplicable}
\]

**SECOND CYCLE:**
\[
V(mog+1+u)_V \quad -u:\emptyset \rightarrow \quad V(mog+1)_V
\]
\[
-l:\emptyset \rightarrow \quad V(mog)_V
\]

\[
\text{MOGLA: } V(ps(mog+1)ps + 5)_V
\]

**FIRST CYCLE:**
as above

**SECOND CYCLE:**
\[
V(mog+1+5)_V \quad \text{[no rules apply]}
\]

\[
\text{BLEKL: } A(AS(blek+1)AS + u)_A
\]

**FIRST CYCLE:**
\[
AS(blek+1)AS \quad -c:o \rightarrow \quad AS(b,l,ek+1)AS
\]
\[
-e:o \rightarrow \quad AS(b,l,ok+1)AS \quad -dl:1 \rightarrow \quad \text{inapplicable}
\]

**SECOND CYCLE:**
\[
A(b,l,ok+1+u)_A \quad -u:\emptyset \rightarrow \quad A(b,l,ok+1)_A
\]
\[
-l:\emptyset \rightarrow \quad \text{inapplicable}
\]
If we turn now to the inf. forms, we see that the inf. morpheme shows an $\bar{1} : \emptyset$ alternation (VEST, but KLÆST'). In addition to this alternation, we note that velar+t$\bar{1}$ results in phonetic [ç,] and that C+t$\bar{1}$ results in phonetic [s,t,š] or [s,t,š] if C is not a velar. The following two rules account for these consonant mutations:

$$(kt:k) \quad t \to \emptyset \quad / \quad [k,g,x] + \_$$
$$(c:s) \quad c \to s \quad / \quad \_ + t$$

**EXAMPLES:**

MOČ: $møg+t\bar{1} \to kt:k \to møg+ï \to k:ç \to møç+ï$

$-c:c, \to møç+ï$ \quad [truncation of final unstressed $\bar{1}$ gives $mø\check{ç}$, and devoicing of final obstruents gives $møç$.]

MESTI: $met+t\bar{1} \to c:c, \to m,et,+t,\bar{1} \to c:s, \to m,es,+t,\bar{1}$

VEZTI: $uez+t\bar{1} \to u:w, \to wez+t\bar{1} \to c:c, \to w,ez,+t,\bar{1}$

$-c:s, \to w,es,+t,\bar{1}$

GRESTI: $greb+t\bar{1} \to c:c, \to g,reb,+t,\bar{1} \to c:s, \to g,r,es,+t,\bar{1}$

KLJAST' (cf. p. 58): $kl\text{i}n+t\bar{1} \to c:c, \to k,l,\text{i}n,+t,\bar{1}$

$(S:ø)$

$-vn- \quad k,l,\text{ø}n,+t,\bar{1} \to S:ø - \text{inapplicable} \to c:s-$

$k,l,\text{ø}s,+t,\bar{1} \quad [\to k,l,\text{ø}s,+t, \to kl,\text{ø}s,t]$
The three exceptions that we know of are inf. ITTI 'to go' (expected *ISTI from id+tī), BYT' 'to be (for the expected *BYST' from būd+tī), and the taboo form ETI : ET'7 (expected *ESTI : *EST' from ēb+tī).

Application of the following rule replaces [s,z] by the corresponding palatal before [ș,ș,ș]:

\[
\begin{align*}
(s:\overline{s}) & \quad \begin{array}{c}
\text{[+obstr]} \\
\text{[+comp]} \\
\text{[+contin]} \\
\text{[+]grave}
\end{array}
\quad \rightarrow \quad \begin{array}{c}
\text{[+obstr]} \\
\text{[+comp]} \\
\text{[+]grave}
\end{array}
\end{align*}
\]

Examples:

1 sg. PROȘCU, from ((prost+I+I)+m): (proș, ș,+ū) → s:ș→ proș, ș,+u

S ȘENOJ, from (su#((gen)+oj): (ș+yn+șj) → s:ș→ (ș+yn+șj)

\[\text{-voicing assimilation} \rightarrow \text{ (ș+yn+șj)}\]

---

7 Cf. Trubetzkoy, Das morphologische System der russischen Sprache, p. 57 fn. 42: "Der Inf. jīt' (etn) „futuere“ wird nur in gewissen festgeprägten Schimpfformeln gebraucht; in normaler infinitivischer Funktion gebraucht man nur jēt' (etn)."
V. THE \{iR\} MARKER

1. The Treatment of Consonants before ɪ.

Dentals and velars before ɪ are replaced by strident palatals: s → ʃ, z → ʒ, t → ʒ, d → ʒ, k → ɔ, g → ɔ, x → ɔ. Details omitted, the following two rules account for these changes:

\[(t:ʃ) \quad [+\text{obstr}] \quad [-\text{grave}] \quad \rightarrow \quad [+\text{compact}] \quad / \quad ɪ\]

\[(k:ɔ) \quad [+\text{obstr}] \quad [+\text{strident}] \quad / \quad [-\text{cons}] \quad [-\text{grave}]\]

Rule \((k:ɔ)\) has already been discussed on pages 18-19. We give here a sample derivation:

3 sg. PLACED: ((plōk+ō+e)+t)

FIRST CYCLE: (plōk+ō+e) → \(\overline{\text{V}}:\ j\) → (plōk+j+e) → k:ɔ →
(plōɔ+j+e) → C:ɔ, → (plōɔ,+j+e)

SECOND CYCLE: (plōɔ,+j+e+t) → e:o → (plōɔ,+j+o+t)

The derivation of strident palatals from dentals goes through an intermediate stage of non-strident palatals:

\[
\begin{align*}
[t, d] \quad & \quad [k, ʒ] \quad & \quad [ɔ, ʒ] \\
+[\text{obstr}] & -t:ʃ → \quad & +[\text{obstr}] & -k:ɔ → \quad & +[\text{obstr}] \\
-\text{grave} & \quad & -\text{grave} & \quad & -\text{grave} \\
-\text{contin} & \quad & -\text{contin} & \quad & -\text{contin} \\
& \quad & +\text{comp} & \quad & +\text{comp} \\
\end{align*}
\]
\[
\begin{array}{ccc}
[s, z] & [\ddot{x}, \dddot{z}] & [\dddot{x}, \dddot{z}] \\
[+\text{obstr}] & -t: \dddot{k} & [+\text{obstr}] & -k: \dddot{c} & [+\text{obstr}] \\
[-\text{grave}] & [+\text{contin}] & [-\text{grave}] & [+\text{contin}] & [+\text{contin}] \\
\end{array}
\]

We give below the underlying representations for some forms with dental-\(\ddot{d}\) clusters without working through the derivations:

3 sg. XOFOXET: \((xoxot+\ddot{c}+e)+t\)

nom. sg. MEZ\(\dot{a}\): \((m\ddot{e}+d)+\ddot{c}\)

3 sg. PI\(\ddot{e}\)ET: \((p\ddot{e}s+\ddot{c}+\ddot{e})+t\)

1 sg. VOŽU: \((uoz+\ddot{I}+\ddot{I})+m\) or \((uod+\ddot{I}+\ddot{I})+m\)

The following rule accounts for the development of labial-\(\ddot{d}\) clusters:

\((\dddot{j}:\ddot{I}) \ 1 \rightarrow 1 \ / \ [-\text{vocal}] \quad [-\text{comp}] \)

Below are given the underlying representations for a few relevant forms:

1 sg. LJUBLJU: \((leub+\ddot{I}+\ddot{I})+m\)

1 sg. TERPLJU: \((terp+\ddot{e}+\ddot{I})+m\)

1 sg. GRAFLJU: \((graf+\ddot{I}+\ddot{I})+m\)
nom. sg. ZEMLJA: ((zem+1)+ō)
compar. DEŚEVLE: ((dexeu+1)+ē)

In the verbal forms given above, [j] will be derived by application of (V:j), in the forms ZEMLJA and DEŚEVLE, by application of (u:w). In ZEMLJA (KAPLJA, LOVLJA etc.) we require a root final labial in order to account for related forms like ZEMNOJ (KAPAT, LOVIT etc.). The derivations of LOVLJA and TORGOLJJA given on page 39 will, of course, include application of rule (j:l).

Consideration of forms with root final m (ZEMLJA, GROMLJU, LOMLJU etc.) shows that (j:l) must apply after (VN), for if it applies before (VN), we would derive incorrect phonetic representations:

From LOMIT 'to break', 1 sg. LOMLJU: ((lom+[l]+m)

PRE-CYCLE: ((lom+[l]+m) →V:O→ ((lom+[l]+u)+m)
FIRST CYCLE: (lom+[l]+u) →V:j→ (lom+j+u) →C:C,→
(lom,+j+u) →j:l→ (lom,+l,+u) →VN→ (lūm,+l,+u)

Even with the reverse order of application, however, incorrect forms will result because of the second cycle application of rule (VN):

FIRST CYCLE: (lom+[l]+u) →V:j→ (lom+j+u) →C:C,→
(lom,+j+u) →VN→ inapplicable →j:l→ (lom,+l,+u)
SECOND CYCLE: (lom,+l,+u+m) →VN[twice]→ (lūm,+l,+ū+m)
Rules (VN) and (j:1) must therefore be restricted to apply only within the boundary of a word. The derivation of 1 sg. LOMLJU will then be as follows:

FIRST CYCLE: (lom+I+u) \( \rightarrow \bar{V}:j- \) (lom+j+u) \( \rightarrow C:C,\rightarrow \)
(lom,+j+u)
SECOND CYCLE: (lom,+j+u+m) \( \rightarrow VN- \) (lom,+j+u+m)
\( \rightarrow N:Ø- \) (lom,+j+u) \( \rightarrow S:Ø- \) inapplicable \( \rightarrow j:1\rightarrow \)
(lom,+l,+u)

Many of the forms thus far mentioned have shown a post-consonantal \( \bar{J} \) which does not occur in phonetic representation. Application of the following rule after (j:1) deletes this (now superfluous) segment:

\( (j:Ø) \quad \bar{J} \rightarrow Ø \quad / \quad [+\text{cons}] \)

The derivation of 3 sg. PLACET, begun on page 86, thus continues in the following manner:

plōč,+j+o+t \( \rightarrow j:1\rightarrow \) inapplicable \( \rightarrow j:Ø- \) plōč,+o+t

A few forms like 3 sg. P'JET 'drinks', VYT'E 'howl(ing), wail(ing)', STAT'JA 'article' show a post-consonantal \( \bar{J} \) in phonetic representation, [p,jšt], [vyt,jʃ], [stat,jʃ] etc. In all these forms, a lax diffuse vowel follows the consonant: p,ij+ʃ+t, wūj+t,+i+j+o, stōt,+i+j+o etc. This vowel is deleted by application of rule (u:Ø), which must apply after (j:Ø). For details on forms like these, see Chapters VI and VII.
Many forms with dental stops before \(\dot{\text{d}}\) do not show \(\ddot{\text{c}}\) \(\ddot{\text{z}}\) in phonetic representation, but rather \(\ddot{\text{c}}\ \ddot{\text{z}}\). The forms with \(\ddot{\text{c}}\ \ddot{\text{z}}\ < \text{ti} \text{dj}\) show other peculiarities as well, such as the non-application of (e:o), distinct treatment of \{o e\} LC clusters, distinct treatment of prefixes and prepositions etc. We will account for all these differences by requiring that morphemes be marked either \{+R\} or \{-R\}. The marking of morphemes is a difficult problem which we shall not attempt to solve. We assume that all morphemes are (somehow) associated either with the marker \{+R\} or with the marker \{-R\}; each segment of a morpheme is specified [ +R ] or [ -R ] by application of a general rule which associates the morpheme marker with individual segments of the morpheme.

We shall thus distinguish the \(\ddot{\text{c}} : \ddot{\text{z}}\) alternation in OTVE-TIT' : OTVEČU from the \(\ddot{\text{c}} : \ddot{\text{z}}\) alternation in VOZVRAČU : VOZVRAŠČU by marking the lexical morpheme in the former \{+R\}, in the latter \{-R\}. Dental stops specified \{-R\} before \(\dot{\text{d}}\) result in \(\ddot{\text{c}} \ddot{\text{z}}\), with one major exception: 1 sg. forms with the cluster \(\text{dj}\) show the \{+R\} alternation \(\ddot{\text{d}} \rightarrow \ddot{\text{c}} \rightarrow \ddot{\text{z}} \rightarrow \ddot{\text{j}}\). Thus, for example, inf. USLADIT' 'to delight, charm', ppp. USLAŽDENNYJ, DI USLA-ŽDAT', but 1 sg. USLAŽU, as opposed to inf. POXIITIT' 'to steal, kidnap', ppp. POXIŠČENNYJ, DI POXIŠČAT', and 1 sg. POXIŠČU.\(^1\)

\(^1\)The facts just cited are, of course, well-known and have been stated, along with numerous examples, in Šaxmatov, Očerk sovremennogo russkogo literaturnogo jazyka, pp. 26-28. Shevelov,
Since we have found no revealing way of describing the transitive softening of dental stops specified [-R], we leave the problem unsolved. It is necessary to point out, however, that [-R] obstruents before sonorant-\dagger\ clusters undergo transitive softening: SLAT' 'to send', but 3 sg. ŠLET; UMERTVIT' 'to kill, destroy', but DI UMERSČVLJAT'; VESNA (nom. pl. VĚSNY) 'spring', but adj. VĚŠNIJ 'spring, vernal' etc. Before sonorant-\dagger\ clusters, [+R] obstruents remain intact: OTOŽ(D)ESTVIT' 'to identify', 1 sg. OTOŽ(D)ESTVLJU, DI OTOŽ(D)ESTVLJAT'; ZAMASLIT' 'to make oily/greasy', 1 sg. ZAMASLIJU, DI ZAMASLIVAT' etc. RAZMYSLIT' 'to reflect, meditate, ponder' has \{+[R}\ 1 sg. RAZMYSLIJU, but \{-R\} DI RAZMYSLIJAT'.

2. The Phonology of \{\o\} LC Clusters.

Many pairs of words show alternate forms \{\o\}L\{\o\} : L\{\u\}; thus, for example, GOROD : GRAD, GOLOS : GLAS, BEREG : BREG etc. The forms in VLV differ from those in LV not only phonologically, but also semantically. We will derive each member of such pairs from the same segmental representations, and the difference in phonetic shape will be accounted for by

Die kirchenslavischen Elemente in der modernen russischen Literatursprache (includes a German translation of Šaxmatov's work) cites a few further examples (pp. 99-105) and gives a criticism of the work of Šaxmatov and other investigators.
the morpheme marker \{+R\}. Morphemes marked \{+R\} will result in phonetic \textit{VLV}, \{-R\} in \textit{L V}. We will require the following rules: \footnote{2The treatment of these clusters follows the suggestion of the pre-publication paper by Halle and Lightner, "On the Phonology of \textit{tort} \textit{tolt} \textit{tert} \textit{telt} in Old Church Slavonic and Russian."}

(V:VV) \begin{align*}
C V L C & \rightarrow \ 1 \ 2 \ 3 \\
1 \ 2 \ 3 & \text{ where } V \text{ represents } [+vocal] \\
\end{align*}

\begin{align*}
& [-\text{cons}] \\
& [-\text{tense}] \\
& [-\text{diff}]
\end{align*}

C represents \{[+cons]\}

L represents \{[+vocal]\}

(VV:V) \_R \begin{align*}
V & \ V \ V \\
-R & -R & \rightarrow & -R \\
\end{align*}

(VL:LV) \begin{align*}
V L C & \rightarrow \ 2 \ 1 \ 3 \\
1 \ 2 \ 3 & \text{ where } V \text{ represents } [+vocal] \\
\end{align*}

\begin{align*}
& [-\text{cons}] \\
& [-\text{diff}]
\end{align*}

The following are some sample derivations:

\textbf{GOROD:} gord \rightarrow V:VV \rightarrow goord \rightarrow (VV:V)_R \rightarrow \text{ inapplicable}

\rightarrow VL:LV \rightarrow gorod
GRAD: gord →V:VV→ goord →(VV:V) → görd
        →VL:LV→ gröd

BREG: berg →V:VV→ beerg →(VV:V) → inapplicable
        +R +R               
        →VL:LV→ bereg →C:C,→ b,er,eg →e:o→ b,er,og

BREG: berg →V:VV→ beerg →(VV:V) → bērg
        →VL:LV→ brēg →C:C,→ b,r,ēg →e:o→ inapplicable
        →R  

Consideration of forms like ČERMED 'turn', ČERÈVO 'womb' shows that (VL:LV) must apply after (kː̞) and before (C:C,), we will show later that (V:VV) and (VV:V) must also apply between (kː̞) and (C:C,). Note that in the {-R} forms like BREG, ČERÈVO, rule (e:o) is inapplicable:

ČERED: kerd →kː̞→ Čered →V:VV→ Čerød →VL:LV→
        +R +R               
Čered →C:C,→ Č,er,ed →e:o→ Č,er,od

ČEREVO: keru+o →u:w→ kerw+o →kː̞→ Čerw+o →V:VV→
        →R  
Čerw+o →(VV:V) →Čerw+o →VL:LV→ Črew+o
        →R  
Čerw+o →C:C,→ Č,r,ew+o →e:o→ inapplicable

If we examine VLV : LV clusters, we see that when the underlying vowel is e, the {+R} form shows olo, whereas the {-R}
form shows \( \text{le}: \text{MOLOKO : MLEKO, VOLO\\u0431 : VLE\\u0441} \) etc. In order to account for this phenomenon, we require application of the following rule:

\[
\begin{array}{l}
\text{(el:ol) } \\
\quad \quad \begin{array}{l}
\quad \quad \quad \quad \text{ [+vocal] } \\
\quad \quad \quad \quad \text{ -cons} \\
\quad \quad \quad \quad \text{ -tense} \\
\quad \quad \quad \quad \text{ -diff} \\
\quad \quad \quad \quad \text{ [+R]}
\end{array}
\end{array}
\rightarrow \quad \quad \begin{array}{l}
\quad \quad \quad \quad \text{ [+grave]} \\
\quad \quad \quad \quad \text{ / } \\
\quad \quad \quad \quad \text{ 1 0 }
\end{array}
\]

This rule must apply before \((V:VV)\) or \((C:C,)\), but after \((k:ç)\), and may, therefore, not be coalesced with either \((V:O)\) or \((E:o)\).³ Examples:

³The facts of Russian force the inclusion of \((el:ol)\) in the grammar. Without this rule we would not, for example, be able to explain the \(e : o\) alternation in 3 sg. \text{MELET 'grinds': inf. MOLO\textsc{t} \ 'to grind'} (we discuss these forms below), nor would we be able to relate \text{MOLOKO 'milk'} with \text{MLEKO} (most commonly found in \text{MLE\textsc{E}NYJ PUT 'Milky Way'}, \text{MLEKOPITAJUS\textsc{E}E 'mammals'}, \text{ZAPOLONIT 'to capture'} with \text{PLEN 'captivity'}, \text{ŠELOM 'helmet'} with \text{ŠLEM 'helmet'} etc. except in the most superficial manner. Moreover, in VI.7, we shall show that \((el:ol)\) is of more general application than suggested here; all lax vowels specified \([+R]\) are backed before \(1 0\). There are, however, several marginal forms which show \(-\text{ELE-}\) before consonant: \text{BELEN\textsc{A} 'hen-bane'}, \text{ŽELEŽÁ (gen. pl. ŽELEŽ) 'gland'}, \text{ŠELEST 'rustle'}, \text{ŠELEŽEN 'drake'}, \text{SELEZENKA 'spleen'} etc. These may be derived from roots with \(el 0\) marked \([-\text{rule (el:ol)}]\). Words like \text{ŽELEŽO 'iron'} must be marked
Incorporation of these rules within the grammar not only permits us to make explicit the relationships which exist between

\[ [-\text{rule } (el:ol)] \]. It is difficult to see how to relate PELENÁ
\[ [-\text{rule } (e:o)] \]
(gen. pl. PELEN) 'shroud', PELENKTI 'swaddling clothes' with PLÉ-KA 'film' except by some ad hoc procedure.
forms like GOROD : GRAD, GOLOS, MOLOKO : MLEKO etc., but also permits us to use already existing rules to account for the existence of palatals and glides before liquids. Thus, for example, we have already seen that by postulating xelm, keru as the underlying roots of ŠLEM, ĖREVO we may apply (k:č) to the velars. Forms with palatal before olo (ŽELOB 'gutter', e.g.) are derived from \{+R\} roots with velar followed by el:

\[
\begin{align*}
ŽELOB: \text{gelb} & \rightarrow k:č \rightarrow ßelb \rightarrow \text{el:ol} \rightarrow ßolt \rightarrow V:VV- \\
& +R \quad +R \quad +R \\
ßoolb \rightarrow VL:LV \rightarrow ßolob \rightarrow & +R
\end{align*}
\]

Forms like VREMJA (cf. fn. 1 p. 49), VLASJANICA 'hair-shirt' etc. will be derived from the \{-R\} roots uer, uols and will therefore undergo application of rule (u:w).

All verbs with inf. in -OT' are derived from roots in \{0\}L: KLOOT 'to stab' from kol, POROT 'to undo, unstitch' from por etc.). The pres. tense forms of these verbs use the verb suffix ã; in the inf. and past tense this suffix does not appear (cf. the treatment of -NUT' verbs, page 65, and also of verbs like BRAT', page 68):

\[
\begin{align*}
\text{KLOOT'}: \text{kol+t, } -V:VV- \text{ kool+t, } -VL:LV- \text{ kolo+t,} \\
\text{KOLJU:} & \quad ((\text{kol+o}+e)+m) \\
\text{PRE-CYCLE:} & \quad ((\text{kol+o}+e)+m) \rightarrow V:O- \quad ((\text{kol+o}+e)+m) \\
\text{FIRST CYCLE:} & \quad (\text{kol+o}+e) \rightarrow V:j- \quad (\text{kol+j}+o) \rightarrow O:O,-
\end{align*}
\]
(kol, + j + o)

SECOND CYCLE: (kol, + j + o + m) → VN → (kol, + j + ü + m)
-(N: ø) and (j: ø) → (kol, + ü)

In the forms MOLOT' : MELET 'grind, mill', the o: e alternation is automatically accounted for by assuming the root mel; thus inf. is derived from (mel+t,) and 3 sg. from ((mel+ö+e)+t).

Most verbs with inf. in \( \{o\}L\{ø\}C' \) must be derived from underlying roots in \( \{o\}L\{ø\}K \); thus BEREÖ from breg, VOLOČ from uolk etc. The verb TOLOČ' 'to pound', however, is not of this type (i.e., the root is not tolk), as can be seen from the pres. tense forms TOLKU, TOLOČET, TOLKUT. If the root were tolk, we would expect pres. *TOLOKU, *TOLOČET, *TOLOKUT, analogous to BEREGU, BEREŻET, BEREJUT and VOLOKU, VOLOČET, VOLOKUT etc. We return to the verb TOLOČ' in VI.7.

Because underlying \( \{o\}L\{ø\}C \) results in \( \{o\}L\{ø\}C \) clusters, we cannot derive phonetic \( \{o\}L\{ø\}C \) (as in XOLM 'hill', VERBA 'willow', TVĖRDYJ 'hard' etc.) from an underlying \( \{o\}L\{ø\}C \); these forms will be derived from \( \{u\}L\{ø\}C \) (XOLM from xulm, VERBA from uurb, TVĖRDYJ from tuird etc.). Discussion of the phonology of \( \{u\}L\{ø\}C \) clusters will be given in Chapter VI, where we discuss the phonology of -T, diffuse vowels.

I can find no examples of eLC in morpheme initial position. Examples of oLC in morpheme initial position are rare.
In discussing anlaut oLO, the only convincing examples are those under stress, because unstressed o a are treated identically, both being pronounced [i] or [i] after sharp consonants, [a] or [e] elsewhere (also, sometimes [y] after palatals; in some dialects a o are treated specially in noun endings). Thus examples like LÓDKA 'boat': LAD'JÁ 'boat', RÓST 'growth': RASTÍ 'to grow' etc. are irrelevant. The relevant examples I have found are the following: orz (as a prefix in RÁZUM 'mind, reason', RÁSPRA 'animosity, hostility' etc.: RÓSČERK 'flourish', RÓSPIP 'painting' etc.; as a lexical root in RÁZNO 'differently': RÓZNO 'apart, separately') and oru (RÁVNYJ 'equal': RÓVNYJ 'even, equal'). Finally, we can relate ORAT' 'to plough' to RÁLO 'wooden plough' by deriving both forms from the same root or. We require the following extension of rule (V:VV); the symbol V represents any +T, non-diffuse vowel, L any liquid, and C any non-vowel:

(V:VV) <-> V L C -> 1 2 3

C <-R>

1 2 3

where we use <-> and <-R> to mean that if the symbol + is present, then the symbol -R must also be present.

4 This verb is interesting because the 1 sg. shows a doublet ORU : ORJU. The 1 sg. from the homonymous inf. ORAT' 'to shout' shows only 1 sg. ORU. We account for these forms by the procedure mentioned on page 68.
Sample derivations:

RAZ-: +orz+ → V:VV→ → orz+ → (VV:V)→ +rōz+
   -R
   -R

ROZ-: +orz+ → V:VV→ inapplicable → VL:LV→ +roz+
   +R

RALO: +org+l+o → V:VV→ → or+l+o → (VV:V)→
   -R
   -R

ORAT': or+ō+t, [no rules apply]

In concluding this section, we point out that if a form marked { -R } contains both an { e }LC cluster and a t di cluster, then the form always shows both LVČ and ŞO Źd; if the form is marked { +R }, then it shows VLV and Ž Ź. Thus, for example, 1 sg. VOZVĂŞCŢI 'I return' : VOŞČŢI 'I return', both derived from the root uort (cf. from the same root VOROTA : VRATA 'gate(s)'). Pairs like MEREŢA : MŘEŢA 'drag-net' show root final velar (merg), for if the root final consonant were dental (merd), we would have *MŘEZDA (cf. ODEŢA : ODEŢDA mentioned on page 57).


We have already observed (pages 21-22 et passim) an e : o alternation in morphemes. An e : o alternation of an entirely
different nature occurs in forms such as the following:

KRĚSTNYJ : KRĚSTNYJ 'of the cross' : 'godfather'
XREBĚT : XREBĚT [dial.] 'spine'
LĚV : LĚV 'lion; Lev' : 'Leo'
PĚRST : NAPĚRSTOK 'finger' : 'thimble'
SOVREMĚNNYJ : SOVREMĚNNYJ 'contemporary'
PADĚŽ : PADĚŽ 'case [gramm.]' : 'loss of cattle' [from the root pad 'fall']
NĚBO : NĚBO 'sky' : 'palate'
PĚKLO : PĚKLO 'scorching heat; Hell'
PREMNIK : NAŽEMNIK 'successor' : 'hireling'
etc.

In each of these pairs, the consonant following e is non-sharp. The forms on the left will be marked \{-R\}, on the right \{+R\}. Rule (e:o) will then be restricted to apply only to segments specified \{+R\}. Note that forms with the cluster d̩ which fail to undergo (e:o) by virtue of the \{-R\} marker also show d̩ → žd̩: NADĚŽDA : NADĚŽA 'hope', e.g.
VI. THE PHONOLOGY OF -T DIFFUSE VOWELS.

1. The following three rules account for the lowering and dropping out of -T diffuse vowels:

\[ (\text{ú} : \text{ő}) \begin{array}{c} +\text{vocal} \\ -\text{cons} \\ -\text{T} \\ +\text{stress} \end{array} \rightarrow \begin{array}{c} [-\text{diffuse}] \end{array} \ / \ X \]

where X represents one or more phonological segments and does not include ##.

\[ (\text{u} : \text{o}) \begin{array}{c} +\text{vocal} \\ -\text{cons} \\ -\text{T} \end{array} \rightarrow \begin{array}{c} [-\text{diffuse}] \end{array} \ / \ \text{C}_1 \begin{array}{c} +\text{vocal} \\ -\text{cons} \\ -\text{T} \\ +\text{diff} \end{array} \]

Where C\textsubscript{1} represents one or more non-vowel.

\[ (\text{u}:\emptyset) \begin{array}{c} +\text{vocal} \\ -\text{cons} \\ -\text{T} \\ +\text{diff} \end{array} \rightarrow \emptyset \ / \ X##

We give below examples of the application of these three rules. Since we are here interested solely in showing that these rules will account for the presence/absence of vowels in the forms given below (and in forms like them), we shall not refer to other rules. It can be seen that rules (C:C), (e:o), and (k:\emptyset) play a large role in the full derivation of these forms.
For a word, the vowel of the preposition drops see VI.6 in 17.

Then interpreted as the vowel which carries the heaviest stress, the last accent of a word is assigned to all vowels preceding an accented vowel. The last accented vowel of a rule which assigns.

The vowel in this word will be stressed by application of a rule which assigns.

<table>
<thead>
<tr>
<th>n.s.</th>
<th>n.s.</th>
<th>u.s.</th>
<th>u.s.</th>
<th>E.s.</th>
<th>E.s.</th>
<th>u.s.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBEOX</td>
<td>MBEX</td>
<td>WESKA</td>
<td>WESKA</td>
<td>MBEX</td>
<td>MBEX</td>
<td>MBEX</td>
</tr>
<tr>
<td>so+ld+pmn</td>
<td>so+ld+pmn</td>
<td>t.s. SO I DON</td>
<td>t.s. SO I DON</td>
<td>t.s.</td>
<td>t.s.</td>
<td>t.s.</td>
</tr>
<tr>
<td>led+</td>
<td>led+</td>
<td>led+</td>
<td>led+</td>
<td>led+</td>
<td>led+</td>
<td>led+</td>
</tr>
<tr>
<td>RO#T+g</td>
<td>RO#T+g</td>
<td>RO#T+g</td>
<td>RO#T+g</td>
<td>RO#T+g</td>
<td>RO#T+g</td>
<td>RO#T+g</td>
</tr>
<tr>
<td>T+</td>
<td>T+</td>
<td>T+</td>
<td>T+</td>
<td>T+</td>
<td>T+</td>
<td>T+</td>
</tr>
<tr>
<td>T+L</td>
<td>T+L</td>
<td>T+L</td>
<td>T+L</td>
<td>T+L</td>
<td>T+L</td>
<td>T+L</td>
</tr>
<tr>
<td>ZOR T+g</td>
<td>ZOR T+g</td>
<td>ZOR T+g</td>
<td>ZOR T+g</td>
<td>ZOR T+g</td>
<td>ZOR T+g</td>
<td>ZOR T+g</td>
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<td>T+</td>
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<td>T+L</td>
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<td>T+L</td>
<td>T+L</td>
<td>T+L</td>
<td>T+L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>after (u: 0)</th>
<th>after (u: o)</th>
<th>after (u: o)</th>
<th>after (u: 0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>representation</td>
<td>representation</td>
<td>representation</td>
<td>representation</td>
</tr>
<tr>
<td>underlining</td>
<td>underlining</td>
<td>underlining</td>
<td>underlining</td>
</tr>
</tbody>
</table>

- 102 -
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_{st+1}$</td>
<td>$I_{st+1}$</td>
<td>$I_{st}$</td>
</tr>
<tr>
<td>$\uparrow L_{st+1}$</td>
<td>$\downarrow I_{st+1}$</td>
<td>$\downarrow I_{st}$</td>
</tr>
<tr>
<td>$\uparrow L_{st}$</td>
<td>$\downarrow I_{st}$</td>
<td>$\downarrow I_{st}$</td>
</tr>
<tr>
<td>$\downarrow L_{st}$</td>
<td>$\uparrow I_{st}$</td>
<td>$\uparrow I_{st}$</td>
</tr>
<tr>
<td>$\downarrow x_m x_n$</td>
<td>$\uparrow x_m x_n$</td>
<td>$\uparrow x_m x_n$</td>
</tr>
<tr>
<td>$\uparrow x_m x_n$</td>
<td>$\downarrow x_m x_n$</td>
<td>$\downarrow x_m x_n$</td>
</tr>
<tr>
<td>$\downarrow x_m x_n$</td>
<td>$\uparrow x_m x_n$</td>
<td>$\uparrow x_m x_n$</td>
</tr>
</tbody>
</table>

- Thereofore not underfoo application of (X:Y)
2. Verbs with past tense and inf. suffix <location1>ō</location1> (cf. page 68) which have a -T diffuse vowel in the root sometimes lower this vowel in pres. tense forms:

<table>
<thead>
<tr>
<th>Verb</th>
<th>Transliteration</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ŽRAT'</td>
<td>ŽRET</td>
<td>BUT</td>
</tr>
<tr>
<td>RVAT'</td>
<td>RVET</td>
<td></td>
</tr>
<tr>
<td>TKAT'</td>
<td>TKET</td>
<td>no pal?</td>
</tr>
<tr>
<td>RŽAT'</td>
<td>RŽET</td>
<td>(tik+c)+t</td>
</tr>
<tr>
<td>ŽDAT'</td>
<td>ŽDET</td>
<td></td>
</tr>
</tbody>
</table>

According to the rules of page 101, verb forms like ŽRET, from ((gir+e)+t), are regular, whereas forms like ZOVET, from ((zuu+e)+t), are irregular. Unless the behavior of the root vowel in these forms can be related in some way to the behavior of -T diffuse vowels in other forms, we will have to label the roots of the verbs of this type as undergoing or not undergoing a special root vowel lowering rule, part (1) of rule (u:o) given below. All other roots will be redundantly specified as not undergoing part (1) of (u:o).

(i)  
\[
(u:o) \quad [u,ɨ] \quad - \quad [-\text{diff}] \quad / \quad (\#) \quad C_1 \quad [u,ɨ]
\]

We derive PODDERET and PODOŽDET, for example, in the following manner:
3. Prefixes and prepositions require special treatment. Because of the scarcity of material on prepositions we shall not treat them in this thesis; in many respects, however, prepositions seem to behave like prefixes.

We consider first the prefixed forms of verbs which have a -T diffuse vowel in the root: BRAT' 'to take', GNAT' 'to drive', ŽEC' 'to burn (down)', DRAT' 'to tear', ŽAT'_n 'to reap', ŽAT'_m 'to press', ŽDAT' 'to wait', ŽRAT' 'to gorge', ZVAT' 'to call', ZRET' 'to behold', LGAT' 'to lie, tell lies', STLAT' 'to spread', SPAT' 'to sleep', RVAT' 'to tear', and GNUT' 'to bend'. Typical forms of these verbs are as follows:
<table>
<thead>
<tr>
<th>simplex</th>
<th>pf. inf.</th>
<th>pf. pres.</th>
<th>DI</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRAT'</td>
<td>VOBRA T'</td>
<td>VBERET</td>
<td>VBI RAT'</td>
</tr>
<tr>
<td>GNAT'</td>
<td>VO GNAT'</td>
<td>VGONIT</td>
<td>VGONJAT'</td>
</tr>
<tr>
<td>DRAT'</td>
<td>IZODRA T'</td>
<td>IZDERET</td>
<td>IZDIRAT'</td>
</tr>
<tr>
<td>ZVAT'</td>
<td>PODOZVAT'</td>
<td>PODZOVET</td>
<td>PODZYVAT'</td>
</tr>
<tr>
<td>STLAT'</td>
<td>IZOSTLAT'</td>
<td>ISSTELET</td>
<td>ISSTILAT'</td>
</tr>
</tbody>
</table>

| ŽAT m | VŽAT' | VOŽMET | VŽIMAT' |
| ŽAT n | PODŽAT' | PODOŽNET | PODŽINAT' |
| MJAT' | VMJAT' | VOMNET | VMINAT' |
| ŽEČ' | RAZŽEČ' 5 | RAZOŽŽET | RAZŽIGAT' |

| RVAT' | NADORVAT' | NADORVET | NADRYVAT' |
| LGAT' | OBOŁGAT' | OBOŁŽET | OBLYGAT' |
| VRAT' | RAZOVRA T'SJA | RAZOVRETSJA | RAZVIRAT'SJA |
| ŽDAT' | PODOŽDAT' | PODOŽDET | PODŽIDAT' |
| ŽRAT' | OBOŽRAT' | OBOŽRET | OBŽIRAT' |
| ZRET' | OBOZRET' | OBOZRIT | OBZIRAT' |
| SPAT' | OTOSPAT'SJA | OTOSPITSJA | OTSYPAT'SJA |
| MČAT' | VOMČAT'SJA | VOMČITSJA | none |
| GNUT' | VOGNUT' | VOGNET | VGIBAT' |

As we have already stated, the forms given above are typical; the entire list of prefixed forms of these verbs is given below. The label (no DI) means that Ušakov does not give a DI

5Past: RAZŽEČ, RAZOŽŽET.
for the form in question. Any deviations from the typical forms given above are cited in footnotes. If neither a footnote nor a 
(no DI) occurs, the prefixed verb is exactly like the correspond-
ing typical example. If a particular prefix is not given, the 
verb is not listed in Ušakov (thus BRAT' with the prefix NAD- is 
not given in Ušakov).

BRAT': VOBRA\'T - VBERET - VBIRAT'
  PODO-, RAZO-, OTO-, VO-SJA, PODO-SJA, RAZO-SJA,
  VZO-SJA, IZ-, PEREIZ-, SO-, SO-SJA, PODSO-,
  OBO-, OBO-SJA, PODSO-SJA.

VRAT': RAZOVRAT'SJA - RAZOVRETSJA - RAZVIRAT'SJA
  SO- (no DI), IZO-SJA (no DI).

Gnut': VOGNUT' - VOGNET - VGIBAT'
  NAD-, PODO-, RAZO-, IZO-, SO-, OTO-, VO-SJA,
  PODO-SJA, RAZO-SJA, IZO-SJA, SO-SJA, OTO-SJA,
  OBO-, OBO-SJA.

6(PERE)IZBRAT' - (PERE)IZBERET - (PERE)IZBIRAT'.
7SOBRAT'(SJA) - SOBERET(SJA) and [PROSTOREĆ] SBERET(SJA)
  - SOBIRAT'(SJA) and [PROSTOREĆ] SBERAT'(SJA).
8PODSOBRAT'(SJA) - PODSOBERET(SJA) - (no DI).
9OBOBRAT'(SJA) - OBERET(SJA) - OBIRAT'(SJA).
10OBOGNUT'(SJA) - OBOGNET(SJA) - OGIBAT'(SJA).
GNAT': VOGNAT' - VYGONIT - VYGONJAT'
    PODO-, RAZO-, OTO-, SO-, OBO-, RAZO-SJA, VOZ-, 11
    IZ- . 12

DRAT': IZODRAT' - IZDERET - IZDIRAT'
    PODO-, RAZO-, NADO-, OTO-, SO-, OBO-, OBO-SJA,
    IZO-SJA, RAZO-SJA, SO-SJA, OTO-SJA.

ŽAT m VŽAT' - VOŽMET - VŽIMAT'
    POD-, RAZ-, OT-, S-, OB-, OB-SJA, RAZ-SJA, S-SJA,
    OT-SJA.

ŽAT h PODŽAT' - PODOŽNET - PODŽINAT'
    OT-, S-, OB-, OB-SJA, OT-SJA.

ŽDAT': PODOŽDAT' - PODOŽDET - PODŽIDAT'
    OBO- (no DI).

ŽEČ': RAZŽEČ' (RAZŽEG, RAZOŽGŁA) - RAZOŽŻET - RAZŽIGAT'
    OB-, POD-, IZ-, VOZ-, 13 S-, OT-, OB-SJA, RAZ-SJA
    IZ-SJA, S-SJA.

ŽRAT': OBOŽRAT' - OBOŽRET - OBOŽIRAT'
    SO- (no DI), OBO-SJA.

11VOZGNAT' - VOZGONIT - VOZGONJAT'.
12IZGNAT' - IZGONIT - IZGONJAT'.
13VOŽŽEČ' (VOZŻEG, VOZŻGLA) - VOŽŻET - VOZŻIGAT'.
ZVAT': PODOZVAT' - PODZOVT - PODZYVAT'
VOZ-,14 OTO-, SO-,15 OBO-, OTO-SJA.

ZRET': OBOZRET' - OBOZRIT - OBIZIRAT' and OBOZREVAT'
VOZ-,16 PODO- (no DI).

IGAT': OBOLGAT' - OBOŁZET - OBYLGAT'
SO- (no DI), RAZO-SJA (no DI), IZO-SJA (no DI).

RVAT': NADORVAT' - NADORVET - NADĚYVAT'
NADO-SJA, OTO-, OTO-SJA, OBC-, OBO-SJA, SO-, SO-SJA, VZO-, VZO-SJA, IZO-, IZO-SJA, VO-SJA,
PODO-, PODO-SJA, RAZO-, RAZO-SJA.

SIAT': RAZOSIAT' - RAZOSLET - RASSYLAT'
PODO-, SO-, OTO-, SO-SJA.

SPAT': OTOSPAT'SJA - OTOSPITSJA - OTSPAT'SJA.
RAZO-SJA (no DI).

STLAT': IZOSTLAT' - ISSTELET - ISSSTILAT'
PODO-, RAZO-, RAZO-SJA.

We consider first the DI's. In all of these forms the

14VOZZVAT' - VOZZOVET - VZYVAT'.
15SOZVAT' - SOZOVET - SOZYVAT' and SZYVAT'.
16VOZZRET' - VOZZRIT - VZIRAT'.
final prefixal -T, diffuse vowel drops by application of (u:\@). For example:

OBLYGAT'j: obu#lug+5j+t, →ViV→ obu#lug+5j+t, →u:∅→ ob#lug+5j+t, →S:∅→ ob#lug+5t,

PODŽINAT'j: podu#gin+5j+t, →ViV→ podu#gin+5j+t,
→k:∅→ podu#zIn+5j+t, →C:C,→ podu#zJ,In+5j+t,
→u:∅→ podu#zJ,In+5j+t, →S:∅→ podu#zJ,In+5t.

Next we consider the form RAZŽE. If we derive this form from razu#gig+l+u, rule (u:o) would apply to the final prefixal vowel, producing RAZOŽE. If we were to derive the form from (razu#(gig+l+u)), however, the rules already proposed will account for the absence of a final prefixal vowel:

FIRST CYCLE: (gig+l+u) →k:∅→ (zg+l+u) →C:C,→ (zg+l+u) →u:o→ (zg+eg+l+u) →e:o→ (zg,og+l+u)
SECOND CYCLE: (razu#zj,og+l+u) →u:∅→ (razu#zj,og+l)
→l:∅→ (razu#zj,og)

From (podu#(bir+5+t,)), the representation of inf. PODOBRAT', we have the following derivation:17

FIRST CYCLE: (bir+5+t,) →C:C,→ (b,ir+5+t,) →(u:o),

17Forms with prepositions have the same structure; VO RTU from (vu#(rut+ou)) and V ROT from (vu#(rut+u)).
(u:∅) → inapplicable
SECOND CYCLE: (podu#b,ir+∅+t,) -u:o- (podo#b,ir+∅+t,)
-u:∅- (podo#b,ri+∅+t,)

On page 113 we give the underlying representations of some of the typical prefixed verbs listed on page 107. The derivations are all straightforward and have not been given (the question of the correct underlying representation of V-/VO- is treated in APPENDIX III to this chapter).

We turn now to the forms which are not derivable from the rules given above; at this point we no longer restrict discussion to the forms mentioned thus far but shall discuss all prefixed forms.

The prefixes V-/VO- and S-/SO- always show the vowel if the following morpheme is {-R}: SOVRATIT'/SOVRASČAT' 'to seduce, lead astray' (cf. [+R] SVOROTIT'/SVORASČIVAT' 'to displace, turn (off, aside)'); SOBLAGOVOLIT' 'to deign'; SOBLAZN 'temptation' (cf. VIII.1 fn. 5); SOBOR 'cathedral' (an "o-nominalization from the root bir; cf. PREFACE, p. 15; the [+R] variant is SBOR 'collection'); SOVESČAT'SJA 'to deliberate on'; SOGIASNYJ 'agreeable; consonant' (cf. [+R] GOLOS 'voice'); SOEDINENIE 'joining, combination' (cf. [+R] ODIN 'one'; see comment in APPENDIX IV to this chapter); SOKRATIT'/SOKRASČAT' 'to shorten, abbreviate' (cf. [+R] KOROTKIJ 'short'); VÒVREMJA 'in time'; VODRUZIT'/VODRUŽAT' 'to erect, hoist'; VOPLOTIT'/VOPLOŠAT' 'to incarnate, embody'; VOPREKÌ 'in spite of'; VOCARIT'SJA/VOCARJAT'SJA 'to ascend the throne' etc.
<table>
<thead>
<tr>
<th>Term</th>
<th>Phrase 1</th>
<th>Phrase 2</th>
<th>Phrase 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZATₚ</td>
<td>podu#(gⁱⁿ+ᵣ,ᵣ)</td>
<td>(podu#((gᵢⁿ⁺ᵣ)+ᵣ))</td>
<td>(podu#(gⁱⁿ⁺ᵣʲᵣ+ᵣ))</td>
</tr>
<tr>
<td>BRATᵣ</td>
<td>(vᵢ⁺(bᵢʳ⁺ᵣ+ᵣ,ᵣ))</td>
<td>(vᵢ⁺((bᵢʳ⁺ᵣ)+ᵣ))</td>
<td>(vᵢ⁺(bᵢʳ⁺ᵣʲᵣ+ᵣ,ᵣ))</td>
</tr>
<tr>
<td>GNATᵣ</td>
<td>(vᵢ⁺(gᵢ⁺⁺ᵣ+ᵣ,ᵣ))</td>
<td>(vᵢ⁺((gᵢⁿ⁺ᵣ⁺ᵣ)+ᵣ))</td>
<td>(vᵢ⁺(gᵢⁿ⁺ᵣ⁺ᵣʲᵣ+ᵣ,ᵣ))</td>
</tr>
<tr>
<td>LGATᵣ</td>
<td>(oᵢ⁺(l⁺⁺ᵣ+ᵣ,ᵣ))</td>
<td>(oᵢ⁺((l⁺⁺ᵣ)+ᵣ))</td>
<td>(oᵢ⁺(l⁺⁺ᵣ⁺ᵣʲᵣ+ᵣ,ᵣ))</td>
</tr>
</tbody>
</table>

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18 See fn. 14 p. 68.
The full form of the prefix is used even if another prefix intervenes: SOPROVODIT'/SOPROVOZDAT' 'to accompany' (cf. \{+R\} SPROVODIT'/SPROVAŽIVAT' 'to show out, get rid of'); SOPRIKOSNOVENIE 'contiguity'; SOVOKUPNOST' 'totality'; SOPODOČNENIE 'coordination [gramm.]' etc.  

The prefix VOZ-/VOS- is used only with \{-R\} morphemes; with \{+R\} morphemes the prefix VZ-/VS-/VZO- is used: VOSXOD 'rise' (cf. \{+R\} VSXODY '(corn) shoots'); VOZGLAS 'exclamation, cry'; VOZVODIT' 'to erect, raise' (cf. \{+R\} VZVODIT' 'to cock (a gun)'; VOSPOMINANIE 'recollection' (note the intervening prefix -PO-; cf. \{+R\} VSPOMNIT' 'to remember'); VOSČUVSTVOVAT' 'to feel, sense'; VOZNENAVIDET' 'to begin to hate' etc.

Prefixes other than V-, S-, and VZ- are not treated in this way before \{-R\} morphemes: alongside SOVRATIT' are RAZ-, IZ-, and OT-VRATIT' etc. For IZ-/IS-/IZO-, see below.

Except for the special treatment of V-, S-, and VZ- just mentioned, prefixes do not have their full form if another prefix follows: PODS- (PODSKAZAT'), PODVZ- (PODVZDOŠNYJ), RASS- (RASSPROSIT') etc.

The prefix S- appears with a vowel before 꾽 followed by a consonant and before 꾽 followed by a consonant: SOSTĚGISVAT',


19 Ušakov lists words in SOPOD-, SOPO-, SOPHI- etc. as bookish; generally speaking, most of the forms we label \{-R\} are considered bookish by Ušakov. Forms like SOPOSTANOVŠČIK 'coproducer [movies, theater]' have the prefix so and do not belong here.
SOSKRĘBYVAT', SOVPADAT', SOVMESTNO etc.; cf. SPRJÁTAT'/SPRJÁČET, SKRUTIT'/SKRUČU etc., where the prefix is followed by a stop-liquid cluster.

We will account for all the facts mentioned on pages 112, 114-115 in the following fashion: first we shall delete the final prefixal vowel if a prefix follows; then we shall insert the vowel o after V- and S- in the environments mentioned above. The prefix VZ-/VS-/VOZ-/VOS-/VZO- will be entered in the lexicon as vzu (but see APPENDIX III). Deletion of prefixal vowels will be accomplished by using two word boundaries between prefixes: (podu##su##(kōz+ō+t,)) for PODSKAZAT', (razu##su##(pros+Ī+t,)) for RASSPROSIT' etc.

PODSKAZAT': (podu##su##(kōz+ō+t,))

FIRST CYCLE: (kōz+ō+t,) [no rules apply]

SECOND CYCLE: (podu##su##kōz+ō+t,) → u:o ← inapplicable

The vowel insertion rule is a transformational rule which applies in the following three environments:

( i ) # [-voc] (##X) # [-R]

| 1 | 2 |

( ii ) # [-voc] [+cons] [-voc] (##X) # [-R]

| 1 | 2 |
(iii)  # [+cons]  # [-voc]  [-voc]
       1        2

(ə-epenth)  1 2 → 1 ə 2

Examples:

SOBOR:  #su#bor##  →  -u:ə→  #s#bor##  →  -ə-epenth(1)→

   #so#bor##

SOPROVODIT': #su##pro#vod,+1+t,##  →  -u:ə→  #s##pro#

   vod,+1+t,##  →  -ə-epenth(1)→  #so##pro#vod,+1+t,##

SOSKRÈBYVAT': #su#skr,əb+uv+ə+t,##  →  -u:ə→  #s#skr,əb+

   +uv+ə+t,##  →  -ə-epenth(iii)→  #so#skr,əb+uv+ə+t,##

VOZOMNIT': #vzo#m,ın,+1+t,##  →  -u:ə→  #vzo#m,ın,+1+t,##

   -u:ə→  #vzo#m,ın,+1+t,##  →  -ə-epenth(ii)→  #vzo#

m,ın,+1+t,##

The prefix ə-/OB-/OBO- presents a problem we cannot account for (see examples on pages 108-110).

The prefixes NIS-/NIZ-/NIZO-, PRE-, and PRED-/PREDO- are used only with {-R} morphemes, but these prefixes are phono-
logically regular: PREEMNIK, PREGRADIT'/PREGRAŽDAT', PREDVOS-
XITIT'/PREDVOSXIŠČAT', PREDOTBRAT'/PREDOTVRAŠČAT', NISPOSĽAT'/
NISPOŠLET etc.

Only IZ-/IS- (never IZO-) occurs before {-R} morphemes: IZBRAT' (but PODO-, RAZO- etc. -BRAT'), IZGNAT' (but RAZO-, OTO-
etc. -GNAT'), ISTKAT' [KNIŽN. USTAR.]: IZOTKAT' etc. We will
account for this fact by using the allomorph ItemClickListener before a {+R}
segment, Izu elsewhere.

4. The suffix -EC drops its vowel in oblique cases in the
overwhelming majority of forms: n.s. KUPEC, g.s. KUPČA, n.s. MO-
LODEC, g.s. MOLODČA etc., etc. The thirty-three exceptions (see
list in APPENDIX I) are of two types: (1) root with a -T diffuse
vowel, and (2) root with some other vowel. Type (1) is exem-
plified by n.s. ZNĚČ, g.s. ZNEČA, n.s. LŠTĚČ, g.s. LŠTĚČÁ etc.;
type (2) by n.s. KOSTRĚČ, g.s. KOSTREČA, n.s. MUDŘĚČ, g.s. MU-
DREČÁ etc.

In order to account for the behavior of the suffix -EC20
we require a special addition to rule (u:o) (see page 105 for
the other parts of this rule):

\[
(u:o) \ [u, i] \rightarrow [-\text{diff}] \quad \left\{ \begin{array}{c}
\begin{array}{c}
\text{c} \quad ([u, i]) \text{c} \\
\text{c} \quad [\text{-cons}] \\
\text{c} \quad [\text{-grave}] \\
\text{c} \quad (\#) \text{c} \quad [u, i]
\end{array}
\end{array} \right. \\
\]

20 In \(X.1\) we shall show that this suffix is derived from
k; for the present we use the underlying representation \(1k\).
Examples:

KOSEC: kos+ic+ů → Č:C,→ kos,+ic+ů → u:o→ kos,
+ec+ů → u:∅→ kos,ec

KOSČA: kos+ic+ť → Č:C,→ kos,+ic+ť → u:o→ inap-
licable → u:∅→ kos,+c+ť

L'STEC: list+ic+ů → Č:C,→ l,is,t,+ic+ů → u:o→
l,is,t,+ec+ů → u:∅→ l,s,t,+ec

L'STECA: list+ic+ť → Č:C,→ l,is,t,+ic+ť → u:o→
l,is,t,+ec+ť → u:∅→ l,s,t,+ec+ť

KOSTREC: kost+r+ic+ů → Č:C,→ kos,t,+r,+ic+ů → u:o→
kos,t,+r,+ec+ů → u:∅→ kos,t,+r,+ec

KOSTRECA: kost+r+ic+ť → Č:C,→ kos,t,+r,+ic+ť → u:o→
kos,t,+r,+ec+ť

The following nouns in -EC show doublets in oblique case
forms: n.s. VOLČEC, g.s. VOLČČA : VOLČČČA, n.s. ČERVČČ, g.s.
ČERVČČA : ČERČČČÁ. In these nouns the suffix must be marked
([-rule (u:o)]), where the outermost parentheses indicates op-
tional choice of the marker:

VOLČČA: volč+ic+ť → u:o→ volč+ec+ť

VOLČČA: volč+ic+ť → u:o→ inapplicable → u:∅→ volč+c+ť
Listed in APPENDIX II are the fourteen nouns which have nom. sg. in -Oce, gen. sg. in -Oca and are thus exceptions to (u:ɔ): n.s. STOLBEC, g.s. STOLBOČ 'column' etc.

5. The suffixes istu and isk lower their vowel after velars and drop it after all other segments:

- BOŽESTVO from bog+istu+o
- DEVSTVO from děu+istu+o
- MONAŠESKIJ from monôx+isk+oj
- ŽENSKIJ from gén+isk+oj

etc.

Thus, with a few exceptions which we treat below, there are no words in {K STVO, G SKIJ, K STVO, X SKIJ, and no words in -ESTVO preceded by a non-palatal. If a {-R} segment precedes these suffixes, the vowel is lowered: ROŽDESTVO, TOŽDE-
STVO, PRAZDNSTVO, ESTESTVO, TOVARIŠČESTVO, MOGUŠČESTVO, IMUŠČE-
STVO, SUŠČESTVO, IZJAŠČESTVO, TOVARIŠČESKIJ. The words MUŽSKOJ (cf. MUŽESKIJ), BESGSTVO, KOLLEŽSKIJ, GERCOGSKIJ, GERCOGSTVO, MU-
ŽELOŽSTVO, and SKOTOLOŽSTVO are apparently isolated exceptions. The remaining exceptions are all derived from proper nouns: NO-
RVEŽSKIJ, PARIŽSKIJ, FRJAŽSKIJ; LJAŠSKIJ, ČEŠSKIJ, LATYSKIJ;
KAZAŠSKIJ, NIVXSKIJ, MEĐIAXSKIJ; KARAKALPASKIJ, UZBEKSKIJ, TA-
DŽIKSKIJ; MAGDEBURGSKIJ, STRASBURGSKIJ; etc.
The behavior of these suffixes seems unrelated to other phenomena and will apparently have to be handled by a rule specific to these suffixes; the exceptions must also be specially marked.

Before istu, isk, the vowel in the suffix ic (from ik) is lowered only in seven words: KUPEČESKIJ, KUPEČESTVO, ŽREČESKIJ, ŽREČESTVO, MOLODEČESTVO, OTEČESKIJ (also OTČESKIJ), and OTEČESTVO (also OTČESTVO). All other forms in ic+istu and ic+isk show Čestv and Česk: STAROBRJADČESTVO, STAROBRJADČESKIJ (cf. STAROBRJADEC, -DCA), POWSTANČESKIJ, POWSTANČESTVO (cf. POWSTANEC, -NGA), BOGOBORČESKIJ, BOGOBORČESTVO (cf. BOGOBOREC, -RCA) etc. The fact that the suffixes istu and isk appear with a lowered vowel (i.e., as estv and esk) is accounted for by application of the special rule mentioned in the last paragraph. In the sequences ik+istu and ik+isk, the suffix ik ought to lower its vowel by application of (u:o), giving ečestv and ečesk (i.e., forms like OTEČESKIJ, *STAROBRJADČESKIJ and not OTČESKIJ, STAROBRJADČESKIJ). In the absence of any deeper insight, we will require a special rule to account for the behavior of ik before istu and isk.


In order to derive root final glides in forms like PIT'.

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21 In X.1 we will explain the shift of o (OTEČ 'father') to Č (OTEČESTVO 'fatherland', OTČESTVO 'patronymic').
ŽIT', MYT', PLYT', ZNAT' etc., rule (u:w) of page 38 must be extended in the following manner:

\[
(u:w) \left\{ \begin{array}{c}
\begin{array}{c}
[-\text{cons}] \\
[-\text{cons}]
\end{array} \\
+\text{voc} \\
+\text{voc}
\end{array} \right. / \\
+T \\
+T
\]

We discuss the proper ordering of the environment below. Examples of the application of (u:w) (capital letters represent archiphonemes\textsuperscript{22} not specified for the feature vocalic):

ŽIT': gīw+t, -u:w→ gīw+t, [cf. fn. 4, p. 37]
MYT': mūj+t, -u:w→ mūj+t,

Consideration of forms like STAT'JA (gen. pl. STATĖJ) 'article' and LJUBOV' (gen. sg. LJUBVI) 'love' shows that a restriction must be placed on the application of (u:w): \textsuperscript{1} before

\textsuperscript{22}Prince Trubetzkoy was apparently the first to introduce the notion of "archiphoneme." See, for example, his "Die Aufhebung der phonologischen Gegensätze," p. 189: "In den Stellung, wo ein aufhebbarer Gegensatz tatsächlich aufgehoben ist, verlieren die spezifischen Merkmale eines Oppositionsgliedes ihre phonologische Geltung, und relevant bleiben nur jene Züge, die beiden Gliedern gemein sind."
ı, and ũ before ũ do not become glides:

STAT'JA: stat+ii+ő → -u:w[twice]→ *stat+jj+ő

BUT: stat+ii+ő → -u:w[once]→ stat+ij+ő

STATEJ: stat+ii+u → -u:w[twice]→ *stat+jj+u

BUT: stat+ii+u → -u:w[once]→ stat+ij+u

Nom. sg. LJUBOV', gen. sg. LJUBVI, from the stem (leub +uu) is treated similarly, except that the stem final consonant (w) is sharped (see XI.1).  

We will account for this exception by application of the following rule, ordered to apply immediately before (u:w):

(u:w-exc) [GameOver] → [-next rule] /  

We restrict application of rules of the type

(exc) X → [-rule Y]

\[23\] Dat., instr., and prep. pl. of CERKOV' 'church' are irregular in that the stem final consonant is non-sharp: CERKVÁM, CERKVÁMI, CERKVÁX. Ušakov labels the forms CERKVJÁM, CERKVJÁMI, CERKVJÁX as PROSTOREČ.
to position immediately before rule Y. These rules thus constitute a notational variant for the environment restriction "except in the env. W." With this restriction on (exc)-rules, we must require that the environments of (u:w) be ordered in the way given on page 121.

It is not immediately apparent that the restriction we have imposed on rule (u:w) is correct. Thus, for example, this restriction would seem to preclude the proper derivation of a form like KLEV (cf. p. 41) if we derive it from the underlying representation kleu+u, for neither part of (u:w) will apply to root final u. In X.1, however, we shall give motivation for considering this "zero" ending to have an even deeper representation, ox. From kleu+ox, we derive klew+ox by application of (u:w) because (u:w-exc) is now inapplicable.

7. On the Phonology of Curo Circ CulC CilC.

Representations with C{u}_{1}-LC are interesting for several reasons. In the first place, the vowel is always lowered, never dropped. In the second place, the vowel is phonetically always grave before 1. In the third place, (e:o) usually does not apply if the consonant following ʼ is grave (TVĚRDYJ, MĚRZNUT' etc., but VĚRBA, CĚRKOV' etc.). In the fourth place, many

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24 The few forms like DĚRGAT' 'to pull, tug', PODČERKIVAT' 'to underline, emphasize' are exceptional.
dialects have a phonetically sharp \( r \), if the following consonant is grave ([tv, ūrdəj] but [v, ěr, bə], [cér, kəf,] in some dialects, [v, ūrbə], [cérkəf,] in others). In the fifth place, some forms result in \( \text{C}^0 \text{L}^0 \text{C} \), as if the underlying representation had been \( \text{C}^0 \text{L}^0 \text{C} \).

These facts may be accounted for by extending the analysis of \( \text{C}^0 \text{L}^0 \text{C} \) clusters. We require the following adaptation of rules given earlier on pages 98 and 92, respectively:

\[
(V:VV) \quad \begin{align*}
\{<->\} & \quad \left[ \begin{array}{c}
\text{V} \\
\text{C}
\end{array} \right] \\
\{<->\}
\end{align*}
\text{L} \quad \text{C} \quad \rightarrow \quad 1 \quad 2 \quad 2 \quad 3
\]

where \( V \) is any \(-T\) vowel, regardless of its diffuseness and the interpretation of the angles is that given on page 98.

\[
(VL:LV) \quad \begin{align*}
\text{V} & \quad \text{L} \quad \text{C} \quad \rightarrow \quad 2 \quad 1 \quad 3 \\
\text{V} & \quad \text{L} \quad \text{C} \quad \rightarrow \quad 1 \quad 2 \quad 3
\end{align*}
\]

where \( V \) is \{\(-\text{T}\)\}

Examples:

MERZNUT': mirz →\( V:VV \)→ mïrz →\( VL:LV \)→ miriz →\( C:C \)→ mïr,ïz

VERBA: uïrb →\( u:w \)→ wirb →\( V:VV \)→ wiïrb →\( VL:LV \)→ wirïb →\( C:C \)→ wïr,ïb
Application of the following rule immediately before (u:o) will ensure that the vowel before (not after) the liquid is lowered:

\[(u:o-ex) \quad X \rightarrow \quad [\text{-next rule}] \quad / \quad L \quad \]

\[\text{CERKVI: cirk+uu+I} \rightarrow \text{-u:w[once]} \rightarrow \text{circ+uw+I} \rightarrow \text{V:VV-} \]
\[\text{circ+uw+I} \rightarrow \text{VL:LV-} \rightarrow \text{circ+uw+I} \rightarrow \text{C:o,-} \]
\[c,ir,k+uw,+I \rightarrow \text{-u:o-ex} \rightarrow \text{c,ir,ik+uw,+I} \rightarrow \text{-u:o} \]
\[c,er,ik+uw,+I \rightarrow \text{-u:q} \rightarrow \text{c,er,k+w,+I} \rightarrow \text{-e:o} \rightarrow \text{in-applicable} \]

In order to permit the application of (e:o) in the representations of forms like TVÊRDYJ, MÊRZNUT', ÇERNYJ, ZÊRNA, MÊRTVYJ etc., we require the following rule to apply before rule (e:o):

\[(r,r) \quad L \rightarrow \quad [\text{-sharp}] \quad / \quad \quad \quad \quad [+\text{cons}] \quad \quad \quad \quad [\text{-grave}] \quad \quad \quad \quad [\text{-sharp}] \]

The derivation of MÊRZ-, which we began on page 124, thus continues as follows:

\[m,ir,iz \rightarrow \text{-u:o-ex} \rightarrow \text{m,ir,iz} \rightarrow \text{-u:o} \rightarrow \text{m,er,iz} \rightarrow \text{-u:q} \rightarrow \]
\[\text{m,er,z} \rightarrow \text{-r,r} \rightarrow \text{m,erz} \rightarrow \text{-e:o} \rightarrow \text{m,orz} \]

The desharping of \( r \) before non-dentals (necessary to
derive the standard pronunciation of CERKOV', VERBA etc.) is accomplished by a rule which applies after (e:o).

Examples like ŽELTYJ 'yellow' (from the {+R} root gilit), ČEÎN 'dug-out, canoe' (from the {+R} root kîln), ŠEÎK 'silk' (from the {+R} root xîlk) etc. show that (el:ol) of page 94 must apply to -T vowels regardless of their diffuseness:

\[(El:Ol) \begin{bmatrix} +\text{vocal} \\ -\text{cons} \\ -T \\ +R \end{bmatrix} \rightarrow [+\text{grave}] / \underline{1 \ C}\]

ŽELT: gîlt+u -k:š→ Žîlt+u -El:Ol→ Žult+u -V:VV→ Žuîlt+u -V:L:V→ Žulut+u -u:o-exc→ Žulut+u
-u:o→ Žolút+u -u:ø→ Žolt

A very small number of {+R} forms in \{u\}LC result in \{l\}C. Thus, for example, the masc. short form of POLNYJ 'full' is POLON (cf. {-R} POLN), of DOLGIJ 'long', DOLOG. The verbs -MERET' 'to die', TERET' 'to rub', PERET' 'to press' show -ERE- in the inf., but not elsewhere (cf. past -MER, TER, PER). The verb TOLOÇ' 'to pound', mentioned on page 97, shows -OLO- in inf. and masc. past (TÔLÔK), but not elsewhere (cf. pres. TÔLKÔ, fem. past TOLKLÁ). We will account for these exceptional forms by marking the root morphemes as [-rule (u:o-exc)]; in the verbs -MERET', TERET', PERET', the roots are marked [-rule (u:o-exc)] only in the inf.; see VII.3 for the derivation of the forms PERET' and TOLOÇ'.
POLON: puln+u →V:VV→ puuln+u →VL:LV→
       -(u:o-exc)           -(u:o-exc)

          pulun+u              -u:o-exc inapplicable
       -(u:o-exc)          →u:o→

polon+u →u:∅→ polon

TOLOK: tulk+l+u [like POLON]
       -(u:o-exc)

TOLKLA: tulk+l+∅ →V:VV→ tuulk+l+∅ →VL:LV→
       -(u:o-exc)

          tuluk+l+∅          →u:o→
       tolok+l+∅             →u:∅→
       tolk+l+∅

PER: pir+l+u →V:VV→ piir+l+u →VL:LV→ piri+l+u
       -C:O,->
       p,ir,l+1+l+u          -u:o-exc
       p,ir,l+1+l+u          →u:o→
       p,er,l+1+l+u          →u:∅→
       p,er+l              →e:o→
       p,or+l               →l:∅→
       p,or
APPENDIX I. The following nouns in -EC retain the suffixal vowel in oblique cases:

BAGREC, BAGRECÁ 'purple cloth, fabric'
BEGLIC 'runaway, fugitive'
BLIZREC 'twin'
VÝZLEC 'male hound, beagle'
GORDEC 'proud man'
DOXLEC 'carrion; rotten egg; very sickly man'
ŽNEC 'reaper, harvester'
ŽREC 'priest, Druid'
IGREC 'player, gambler'
KOSTREC 'loins; leg of beef'
KUZREC 'blacksmith'
LŽREC 'liar'
L'STEC 'flatterer, adulator'
MERTVEC 'corpse'
MOKREC
MUDREC 'sage'
NAGLEC 'insolent/impertinent fellow'
NUTREC 'kind of disease of horses'
OVSEC 'dim. of OVĚC <<oats>>'
OSTREC 'a kind of cereal'
PODLEC 'scoundrel, villain'
POŠLEC 'commonplace person'
REMREC 'kind of tapeworm'
ROŽREC 'a kind of hook'
STERVEC 'foul/repulsive man'
TJAGLEC 'taxed person'
XITREC 'sly/cunning person'
XRABREC 'brave/courageous man'
ČABREC 'savory'
ČERNEC 'monk'
ČTREC 'reader'
ŠVEC 'tailor'
ŠEL'MEC 'rogue, rascal'

APPENDIX II. The following nouns in Čecer drop the suffixal vowel in oblique cases:

AGREC, AGNCA 'lamb'
GROMOVERŽEC 'the Thunderer [myth. poet.]
GARNEC '3.28 litres'
-LANDEC
GOLBEC 'a kind of closet'
ISTEC 'plaintiff'
KRESTEC 'sacrum [anatom.]

NORMANDEC 'Norman'
ORLEC 'a round rug with a woven design of an eagle'
STRASTOTERPEC 'sufferer, martyr'
SAMORDERŽEC 'autocrat'
STOLBEC 'column'
FLAMANDEC 'Fleming'
XVOSTEC 'coccyx'

APPENDIX III. Prothetic Glides.

The following set of rules accounts for the presence of glides before initial Ȝ ̄ Ė Š ̄ ȷ ̄ ː ́ ́ ́ ́.
(##1: ##I) \[
\begin{bmatrix}
-\text{cons} \\
+\text{diff} \\
-\text{grave}
\end{bmatrix} \rightarrow [ + T ] / \# \{ \text{C} \} \#
\]

(\emptyset: j) \# \[
\begin{bmatrix}
-\text{cons} \\
\uparrow T \\
-\text{diff} \\
\oplus \text{grave} \\
+R
\end{bmatrix}
\]
\[
C \rightarrow 1 \downarrow 2 \uparrow 3
\]

(\emptyset: j/w) \# \[
\begin{bmatrix}
-\text{cons} \\
\downarrow \text{diff} \\
\oplus \text{grave}
\end{bmatrix}
\]
\[
C \rightarrow 1 \downarrow 2 \uparrow 3
\]

Examples:

AGNEC 'lamb': \#\#\#\#gn+1c+u## [none of the above rules applies]

JAGNENOK 'lamb': \#\#\#\#gn+en+uk+u## \-\emptyset: j- \+R
\#\#j\#gn+en+uk+u## etc.

EGO: \#\#i+ouo## \rightarrow (##1: ##I), (\emptyset: j), (\emptyset: j/w) \rightarrow \text{inapplicable}
\-u:w\rightarrow \#\#j+owo## etc.
IX:  ##1+ûxu##  →(##1:##i), (ø:j), (ø:j/w)→ inapplicable →u:w→ ##j+ûxu## →u:ø→ ##j+ûx## [rule (y:i), given in XI.1, fronts the vowel in this form to give jix]

IDET:  ##id+e+t##  →##1:##1→ ##id+e+t## →(ø:j), (ø:j/w)→ inapplicable etc.

VOJDET:  ##u#id+e+t##  →##1:##1→ inapplicable →ø:j→
##u#j1d+e+t##  →ø:j/w→ ##wu#j1d+e+t##  →u:o→
##wo#j1d+e+t##  →u:ø→ ##wo#j1d+e+t##  etc.

SYGRAT':  ##su#igr+øi+t##  →(ø:j) and (ø:j/w)→ inapplicable →u:w→ ##su#igr+øj+t##  →u:ø→ ##s#igr+øj+t##
→S:ø→ ##s#igr+ø+t## [rule (y:i), given in XI.1, backs the root vowel in this form, giving, ultimately, sygrat.]

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1S.C. Boyanus, Russian Pronunciation and Russian Phonetic Reader, p. 132, writes: "The initial sound i (written I) in the instr. sing. masc. and neut. and the gen., dat., instr. plural of the 3rd person (ON, ONO, ONA) IM and IX, IM, IMI is exceptionally pronounced by many speakers as jim; jix, jim, jim,i by analogy with EGO ji'vo, EMU ji'mu, and the pronunciation im; ix, im, 'im,i sounds bookish to them. This was pointed out to me by the late Professor Ushakov of Moscow University,..." It is not clear how to derive the "bookish" pronunciation of these forms without initial i.
APPENDIX IV. Marginal Notes on Glides.

{-R} forms may begin in #ju (SOJUZ [cf. p. 56 fn. 8], JUG 'south' etc.), but {+R} forms may not (UZY, UŽIN 'supper' etc.). The following rule accounts for this distribution:

\[(jo:o) \quad [-\text{voc}] \quad \rightarrow \quad \emptyset \quad / \quad \# \quad [^0_{+R}]\]

Application of \((jo:o)\) drops the initial segment in ionz (underlying UZY) and in ioug (underlying UŽIN).

In the historical development of Russian, initial #je > #e > #o in some forms.¹ To my knowledge, the only trace that these changes have left in the grammar of the present-day language is found in the pair ODIN : EDIN-. The synchronic grammar of Russian will use the initial sequence io. In the \{+R\} form rule \((jo:o)\) will drop the first segment; in the \{-R\} form rule \((u:w)\) will shift the first segment to \(i\) and rule \((o:e)\), given on page 165, will shift the second segment front to give je.²

¹ These sound changes apparently depended not only on the gravity of the vowel in the following syllable, but also on the accent of the form in question; see Jakobson, "Remarques sur l'évolution phonologique du russe comparée à celle des autres langues slaves," pp. 45-47.

² I am indebted to Wayles Browne for this ingenious explanation of the \(je : o\) alternation in these forms.
VII. THE PHONOLOGY OF +T DIFFUSE VOWELS.

1. The following rule, which applies before (ü:ô), applies to +T diffuse vowels before i:

$$(ü:u) \begin{bmatrix} +\text{vocal} \\ -\text{cons} \\ +\text{diff} \\ +\text{R} \end{bmatrix} \rightarrow [ -T ] / \, \text{I V}$$

EXAMPLES:

PIT': $pî1+t, \quad -u:w \rightarrow \, pîj+t, \quad -ü:u \rightarrow \text{inapplicable}$

P'ÉT [cf. p. 104]: $pî1+e+t \quad -u:w \rightarrow \, pîj+e+t \quad -ü:u \rightarrow \, pij+e+t$

BRIT' - BREET 'shave' and MYT' - MOET 'wash' have similar derivations from (brîi+t,) - ((brîi+e)+t) and (müi+t,) - ((müi+e)+t), respectively. Nouns like VOROBÊJ (gen. sg. VORO-B'JÁ) 'sparrow', STAT'JÁ (gen. pl. STATÉJ) 'article', PIT'É (gen. pl. PITEJ) 'drinking' are formed with the help of the [+R] noun suffix $\text{Ii}$:

VOROBEJ: $uorb+Ii+u \rightarrow (u:w)[\text{twice}], (V:VV), (VL:LV), (C:C), \rightarrow$

$\text{worob,}+Ij+u \rightarrow \, -ü:u \rightarrow \text{worob,}+ij+u \rightarrow \, -u:o \rightarrow \text{worob,}+ej+u$

$\rightarrow \, -u:o \rightarrow \text{worob,}+ej$
STAT'JA: stōt+īi+ō →(u:w), (C:C,)→ stōt,+īj+ō →j:ō→
inapplicable [cf. p. 89] →u:ō→ stōt,+ō

Nouns like ŽRĘBIJ 'lot, fate, destiny', ARMÍJA 'army', BYTIĘ 'being, existence', on the other hand, use the {-R} suffix ĭi:1

ARMÍJA: ārm+īi+ō →(u:w), (C:C,)→ ārm,+īj+ō →ū:u→
inapplicable

Alongside the noun ARMÍJA with the {-R} ĭi suffix is the adjective ARMÉJSKIJ with the {+R} suffix:

ARMÉJSKIJ: ārm+īi+isk+oj →(u:w), (C:C,)→ ārm,+īj+isk+oj →ū:o→ ārm,+ēj+isk+oj
→u:ō→ ārm,+ēj+sk+oj [note that (S:ō) must apply before (u:ō)]

1The assignment of the marker {±R} to the substantive suffix ĭi is not random; if the root is {+R}, the {+R} suffix is used; otherwise the {-R} suffix. Thus VOROBEJ, from the {+R} root uorb uses the {+R} suffix; ŽRĘBIJ, from the {-R} root gerb, uses the {-R} suffix. The root in ARMÍJA, ārm, belongs to a special class of roots marked {+S} (see Chapter XIV); the {-R} suffix ĭi is thus used here also. Derived adjectives, which we discuss immediately below, always use the {+R} suffix ĭi, and this suffix is always accented (cf. p. 102, fn. 1).
There are many pairs like ARMIJA - ARMEJSKIJ: Gvardija
- Gvardejskij; Sudija - Sudejskij; Gil'dija - Gil'dejskij; Biblja - Biplejskij; Kampaniya - Kampanejskij; Indija - Injej
- Skij; Policija - Policijskij etc.

2. The clusters ků, gů, and xů result in phonetic [k,i],
[g,i] and [x,i] (cf. p. 11 fn. 3); the following rule, which
fronts ũ after velars, applies between (k:š) and (C:C,):

\[(ũ:ũ) \begin{array}{c}
\text{voc} \\
\text{cons} \\
\text{diff}
\end{array} \rightarrow [-\text{grave}] / \begin{array}{c}
\text{compact} \\
\text{grave}
\end{array}
\]

-Gibat': (gub+ôj+t,)_{DI} \rightarrow V:ũ→ (gûb+ôj+t,) \rightarrow k:š→ in-
applicable \rightarrow ũ:ũ→ (gôb+ôj+t,) \rightarrow C:C,→ (gôb+ôj+t,)
\rightarrow S:š→ (gûb+ôj+t,)

Xitro: xûtr+o \rightarrow ũ:ũ→ xîtr+o \rightarrow C:C,→ xîtr+o [for
masc. Xiter, see VIII.1]

3. The following rule, which applies before (u:o), specifies
unstressed ũ in final position not after a consonant cluster -T:²

²This rule is a slightly modified version of a rule sug-
gested by Roman Jakobson, "Russian conjugation," #2.122, p. 158.
For the historical development, see Šaxmatov, Očerk drevnejšego
perioda istorii russkogo jazyka, #360, pp. 222-224.
(I#: i#) \[\begin{align*}
&\text{[ -conson]} \\
&\text{ +diff} \\
&\text{ -stress} \\
&\text{ +R}
\end{align*}\] 
\[\rightarrow \big[ -T \big] \big/ \ V \mathcal{O}^{1} \ (+t) \] 

where \(\mathcal{O}^{1}\) stands for "at most one consonant"

Examples:

PERET' (cf. p. 126): \(\# \text{pir} + t\text{I}\# \rightarrow \text{V:VV} \rightarrow \# \text{pir} + t\text{I}\# \rightarrow \text{VL:LV} \rightarrow \) 
\(\text{-V:VV} \rightarrow \# \text{pir} + t\text{I}\# \rightarrow \text{C:O,} \rightarrow \# \text{pir}, i+t,\text{I}\# \rightarrow \text{VL:LV} \rightarrow \) 
\(\text{-u:o-exc} \rightarrow \inapplicable \)

TOLOČ': \(\# \text{tulk} + t\text{I}\# \rightarrow \text{V:VV} \rightarrow \# \text{tulk} + t\text{I}\# \rightarrow \text{VL:LV} \rightarrow \)

\(\# \text{tulk} + t\text{I}\# \rightarrow \text{kt:k} \rightarrow \# \text{tulk} + t\text{I}\# \rightarrow \text{k:o} \rightarrow \)

\(\# \text{tuluc} + t\text{I}\# \rightarrow \text{C:O,} \rightarrow \# \text{tuluc} + t\text{I}\# \rightarrow \text{VL:LV} \rightarrow \) 
\(\text{-u:o-exc} \rightarrow \inapplicable \)

NESTI: \(\text{nes+ti} \rightarrow \text{C:O,} \rightarrow \text{n,es+ti} \rightarrow \text{I#:i#} \rightarrow \inapplicable \)
PRÝGNITE (cf. p. 65; for the # boundary marker after imperative singular, see below): (((prug+n+e)+I#)+te)
FIRST CYCLE: (prug+n+e) \rightarrow C:C \rightarrow (prug,+n,+e)
SECOND CYCLE: (prug,+n,+e+I#) \rightarrow V:Ø \rightarrow (prug,+n,+I#)

- I#:i# \rightarrow inapplicable
THIRD CYCLE: (prug,+n,+I#te) \rightarrow C:C \rightarrow (prug,+n,+I#t,e)

As can be seen from the above derivations, this rule is designed to account for the alternation in inf. -TÍ : - T! and in imperative I : Ø (GOVORÍ, PRÝGNI : GÓTOV!). We require a boundary marker after imperative singular and before the reflexive particle in order to account for forms like inf. OTMÉTÍ'SJA, imperative OTMÉTÍ'SJA! ZHÁJTE! etc. The imperative PÔMNI! 'remember', from ((p'o+min+i+I)+I#), is exceptional in not undergoing (I#:i#). The imperatives of velar stems (PEKT! BEREGI! etc.) are exceptional in not undergoing (k:Ø) (further discussion in IX,1).

In IX,1, X,1, and XI,1 we shall show that the noun-, adjective-, and verb-endings -Y/-I are not derived from I or Ù, and that (I#:i#) is therefore not applicable to the representations of forms like KNÍGI 'books (nom. pl.), GÓTOVY 'ready (pl. short)', DŮMÁLI 'they were thinking' etc.

3 Roman Jakobson was the first to suggest this solution, "Zur Struktur des russischen Verbums," p. 356.
Adverbs in -I derived from adjectives in -IJ (D'JAVOL'-SKI 'devisishly' from D'JAVOL'SKIJ, PO-PTIČ'I 'like a bird' from PTICIJ etc.) do not terminate in İañ at the time of application of (İ#;i#), nor do adverbs formed from preposition + noun phrases (İZDALI 'from afar', SZÁDI 'from behind' etc.). Some adverbs and particles do terminate in İañ, and these forms may undergo (İ#;i#) if marked {+I}. RÁDI 'for the sake of' and PO-ČTI 'almost' are not affected by (İ#;i#), RÁDI because it is marked {-I}, POČTI because the final İ is stressed and after two consonants. Doublets like LI : L', 4 BY : B will be accounted for by requiring that the lexical morphemes li and bü be optionally marked either {+I} or {-I}. The final diffuse vowel is specified [-T] if the marker {+I} is chosen, left as [+T] if the marker {-I} is chosen. TEPÉR' 'now', OČEN' 'very', ZDÉS' 'here', OPJAT' 'again' etc. undergo application of (İ#;i). Forms like AL'PÁRI 'at par', APOSTERIORI 'a posteriori', APRIORI 'a priori' etc. belong to the {+I} class of morphemes mentioned in footnote 1, page 134, and will be automatically excluded from undergoing application of (İ#;i#).

4And all the derivatives: KŌLI : KŌL', UŽELI : UŽEL', ĮLI : ĮL' etc. The initial morpheme in ĀLI : ĀL' must be marked {-I} in order to prevent application of (ø:j) (cf. p. 130).
VIII. THE TRANSFORMATIONAL CYCLE: rule (e:o).

In the preceding chapters we have seen that (e:o) plays a crucial role in the derivation of a large number of forms. In this chapter we will consider some forms which require us to revise the original formulation of this rule given on page 22.

The revised form of (e:o) will lead us to attempt an answer to one of the two questions raised earlier on pages 43-44.

The following forms show the shift of e to o before a consonant which is specified \textit{sharp} at the time of application of rule (e:o):

(i) before 2 pl. -TE: NESÉTE 'you carry'

(ii) before loc. sg. -E: KLÉNE (from KLÉN 'maple')

(iii) before fem. dat. sg. -E: BERÉZE (from BERÉZA 'birch')

(iv) before diminutive -IK: PÉSÍK (from PÉS 'dog')

(v) before dim. -EC: SČETEC (from SČET 'bill, account')

(vi) before dim. -K-: SČECKA (from SČEKÁ 'cheek')

(vii) before adj. -NYJ: KOLÉSNYJ 'wheel' (from KOLÉSÓ 'wheel')

(viii) before past pl. -LI: TÉRLI 'they were rubbing'

(ix) in the verbs STRÉMIT 'to stand on guard' and OKAZÉNIT 'to make trite, stereotyped, banal'

(x) before nom. -IN-: BERÉZINA 'felled birch tree'
(xi) in masc. short form of a few adjectives: TËPEL 'warm'


1. We consider first the masc. short adjectives and the gen. plurals. Gen. pl. forms like ZEMĚL' from ((zem+1)+u), LÔVEL' from ((lou+1)+u), KAPEL' from ((kop+1)+u)--cf. pages 38–40, and 88--show that the final vowel (ZEMĚL' etc.) must be inserted because it does not appear in the underlying representation. If we assumed that this vowel is inserted after the application of (e:o), then we could explain o < e in TËPEL, MĚTEL, RĚBER etc. by postulating that the final vowel in these forms was also inserted.

The forms ORLIJ 'of eagle', OSLIJ 'of ass' give further support for a rule which inserts vowels. If we were to derive the base nouns ORLÉL (gen. sg. ORLÁ) 'eagle' and OSEŁ (gen. sg. OSLÁ) 'ass' from orl and osil, respectively, then we would expect generic adjectives *ORLIJ and *OSLIJ (cf. PESIJ [from PÈS, PSÁ 'dog'], OVEČIJI [from OVCÁ, gen. pl. OVEC 'sheep'], SELEZÈNIJ [from SÈLEZEN', SÈLEZNJA 'drake'] etc.):
ORELIJ: orl+ij+u → C:C, → orl+i+j+u → u:o → *orl,el,+e+u

Assumption of an inserted vowel in these forms at least permits us to derive vowels in the correct position if we restrict the position of insertion to before a word final consonant (we will show below in section 3 how this vowel sharps preceding consonants and is shifted to o before non-sharp consonants):

OREL: orl+u → u:∅ → orl → insertion → orel

ORLA: orl+∅ [no insertion]

ORELIJ: orl+i+j+u → u:o → orl+e+j+u → u:∅ → orl+e+j [no insertion]

Since all of the forms in which we want to insert a vowel terminate in n m r l, we will propose the following rule (to be modified somewhat in section 3 below):

(∅ : e) Insert e / C [ +cons ] #

This rule applies after (e:o), (dl:l), and (l:∅); the derivations given below are abbreviated in the obvious fashion:

METEL (gen. pl. of META): #met+l+u# → C:C, → #m,et+l+u#
   → u:∅ → #m,et+l# → e:o → #m,ot+l# → ∅:e→
   #m,ot+el#^1

^1We have found no reason for requiring the vowel to be in
MÊL (masc. past of MESTI 'to sweep'): #met+l+u# → C:C, → #m,et+l+u# → u:∅ → #m,et+l# → e:o → #m,ot+l# → dl:l → #m,o+l# → ∅:e→ inapplicable

We will extend the application of (∅:e) to insert o after velars, e elsewhere in order to predict the o in forms like OGÓN' (g.s. OGNJA) 'fire'; ÚGOL' (g.s. ÚGLJÁ) 'coal'; ÚGOL (g.s. ÚGLÁ) 'corner'; STEKOL (g.pl. of STEKLO 'glass'); SVÉKOR (g.s. SVÉKRA) 'father-in-law (husband's father)'; ÚGOR' (g.s. UGRJÁ) 'eel; blackhead, pimple'; VIXÓR (g.s. VI-XRÁ) 'tuft' etc.:

(∅:E) Insert [ +vocal ] / [ cons ] [ -comp ] --- [ cons ]
[ -obstr ]
[ -diff ]
[ grave ]

Some forms fail to undergo application of (∅:E): gen. pl. IGL 'of needles', IGR 'of games', SVÉRL 'of drills', VOLN 'of waves' etc.; nom. sg. KREML' 'Kremlin', ŽURÁVL' 'crane', ČEĽN 'dug-out, canoe', DĚRN 'turf', TĚRN 'sloe; blackthorn' etc.; masc. short KRUGL 'round', SMUGL 'dark-complexioned', PĚSTR 'motley, variegated' etc.2 We will mark such forms as

2Reference to an atergo dictionary will show that the number of these forms is not overwhelmingly large in comparison with the number of forms that do undergo (∅:E). This explains the relatively few forms found in -Cr#, -On#, -Cl#,
[-rule ($\emptyset$;E)]. Since this procedure will require marking virtually every morpheme as undergoing or not undergoing ($\emptyset$;E), it is likely that we have missed some generalization. The following observations do not seem totally adequate, but they may help in ultimately arriving at some more revealing generalization (the lists under (i) and (ii) are complete):

(i) Feminine nouns in labial+$\circ$ always undergo ($\emptyset$;E): LOVLJA - LOVEL'; KAPLJA - KAPEL'; ZEMLJA - ZEMEL'; SABIJA - SABEL'; O-GLOBLJA - OGOBEL'; KROVLJA - KROVEL'; CAPlJA - CAPEL' (MJAMLJA and SOPLJA have gen. pl. in -EJ [cf. APPENDIX to Chapter XI]; GREBLJA, TRAVLJA, TORGOLVLA, KONOPLJA, and KUPLJA have no plural).

(ii) Masc. nouns in labial+$\circ$ generally do not undergo ($\emptyset$;E): KREML'; RUBL'; ŽURAVL'; KORABL' (but cf. KORABEL'NYJ, KORABEL'-L'ŠOK); GOALVL'; GOOLVL'. Exceptions: ŽURAVEL' [OBL.]; STE-BEL' (gen. sg. STEBLJA; cf. STEBLČ, gen. pl. STEBEL); KOMEL' (gen. sg. KOMLJA) [OBL.].

(iii) Adjectives generally do not undergo ($\emptyset$;E): KRUGL, SMUGL, BYSTR, DRJABL, NAGL, PODL, BLEKL, TUSKL, KRIPL, SIPL, ŠČUPL, ČAXL, ZATXL, ŽUXL, PUXL, TUXL, RYXL, DRJAXL, POŠL, XRABR, DOBR.

-Cm#. Forms like TEATR, TIGR, METR, CIKL, PERL, FAVN, GIMN, FIRN etc. are {+S} morphemes, which we treat in Chapter XIV (cf. pp. 134 fn. 1, 138); these forms will be automatically excluded from undergoing ($\emptyset$;E). Forms like VETR 'wind' (cf. VETER 'wind'), POLN 'full' (cf. POLON 'full'), SOBLAZN 'temptation', ŽEZL 'rod, staff', VIXR' 'whirlwind' (cf. VIXOR 'tuft') etc. are {-R} forms, a class which will also automatically be excluded from ($\emptyset$;E).
ŠEDR, BODR, MUDR, MOKR, PĚSTR. But ŠUSTER, XITĚR, TĚPEL, KISEL, SVETEL. Note the doublet OSTĚR : OSTR (but only VOSTĚR). This represents a complete list of adjectives in -CRY I and -CRI J; there are no adjectives in -CLČ I or -CRI Č. Adjectives in -CNY I and -ČNO I are formed with the help of the suffix IN and are discussed in section 2 below; POLON 'full' does not belong here and has already been discussed on pages 126-127.

(iv) Fem. and neut. nouns generally undergo (Ø:E) in gen. pl. But IGRA - IGR, IGLA - IGL, VOLNA - VOLN, SVĚRL - SVĚRL etc.

2. Let us now consider the remaining forms which show the shift of e to o before a sharp consonant. It may be seen that in every one of these forms the shift occurs in a stem which is followed by a suffix or ending containing a front vowel. Thus in 2 pl. NESĚTE, the pres. stem (nes+e) is followed by the ending te; in loc. sg. KLĚNE and dat. sg. BERĚZE, the noun stems (klen) and (berz) are followed by the ending Ž3; in SŮTEC, PĚSIK, SŮČKA, the noun stems (ket), (pis), (skek) are followed by the suffixes IO, IK, IK, respectively; in ZVĚZDY, the noun stem (uezd) is followed by the suffix IN;4 in TĚRLI, the past stem (tir+1) is

3From øI; cf. p. 103 fn 4.

4Adjectives in -NYJ are denominal: SĽĚZNYJ 'lachrymal' (cf. SĽEZA 'tear'), SĽĚČNYJ 'cheek' (cf. SĽĚKA 'cheek'), NĚ-BNYJ 'palatal' (cf. NĚBO 'palate'), ZVĚZDNYJ 'starry' (cf. ZVE-
followed by the ending I5; in BEREZINA, the noun stem (berz) is followed by the suffix Iî etc. In order to permit the application of (e:o) in these forms, we will take advantage of the constituent structure of these forms and revise (e:o) in the following manner:

\[(e:o - exc) \quad X \rightarrow \quad \text{[-next rule]} \quad / \quad \{ \quad [\text{-cons}] \quad \} \quad \{ \quad [\text{+sharp}] \quad \}\]

\[(e:o) \quad \{ \quad [\text{+voc}] \quad \} \quad \rightarrow \quad \{ \quad [\text{+grave}] \quad \}\]

ZDA 'star') etc. Adjectives in -SKIJ, on the other hand, are primarily not denominal: RABSKIJ 'servile' (cf. RAB 'slave'), ADSKIJ 'infernal' (cf. AD 'Hell'), MUŽESKIJ 'masculine [gramm.]' (cf. MUŽ 'husband'); FILOSOFSKIJ 'philosophical' (cf. FILOSOF 'philosopher') etc. See below.

\(^5\) From e1; cf. p. 137.

\(^6\) In IX.1 we shall show the need for introducing two additional diphthongs (in addition to ou and eu mentioned in Chapter III): eï and oï. The environment condition \([-\text{cons}]\) is needed in order to prevent rule (e:o) as formulated immediately below from applying to the first segment of the diphthong eï.
The derivation of the pres. tense forms of NESTI will now show the following first cycle:

\[
\begin{align*}
(nes+\overset{e}{\circ}) & \rightarrow (n,es,+\overset{e}{\circ}) \rightarrow e:o \rightarrow (n,es,+\overset{o}{\circ})
\end{align*}
\]

Similar derivations are obtainable for the forms BERĚZE, BERĚZINA, KLĚNE etc.; the first cycle will operate on the base constituents (berz) and (klen); it can be seen that the newly formulated \((e:o)\) applies correctly in these cases. We give the derivations of a few relevant forms:

**NESĚTE:** \(((nes+\overset{e}{\circ})+te)\)

**FIRST CYCLE:** as above

**SECOND CYCLE:** \((n,es,+\overset{o}{\circ}+te) \rightarrow C:C,\rightarrow (n,es,+\overset{o}{\circ}+t,e)\)

\[
\begin{align*}
-e:o & \rightarrow (n,es,+\overset{o}{\circ}+t,o)
\end{align*}
\]

**ZVĚZDNÝJ:** \(((zuězd)+in)+oj)\)

**FIRST CYCLE:** \((zuězd) \rightarrow u:w \rightarrow (zwězd) \rightarrow C:C,\rightarrow (z,w,\overset{e}{\circ}zd)\)

\[
\begin{align*}
-e:o & \rightarrow (z,w,\overset{o}{\circ}zd)
\end{align*}
\]

**SECOND CYCLE:** \((z,w,\overset{e}{\circ}zd+in) \rightarrow C:C,\rightarrow (z,w,\overset{o}{\circ}z,d,+in)\)

**THIRD CYCLE:** \((z,w,\overset{o}{\circ}z,d,+in+oj) \rightarrow u:o \rightarrow (z,w,\overset{o}{\circ}z,d,+n+oj)\)

**ŠČĚKÁ:** \(((skěk)+ik)+\overset{o}{\circ})\)

**FIRST CYCLE:** \((skěk) \rightarrow k:č \rightarrow (sčěk) \rightarrow C:C,\rightarrow (s,č,ěk)\)

\[
\begin{align*}
-e:o & \rightarrow (s,č,\overset{č}{\circ}k)
\end{align*}
\]

**SECOND CYCLE:** \((s,č,\overset{č}{\circ}k+ik) \rightarrow k:č \rightarrow (s,č,\overset{o}{\circ}č+1k)\)

\[
\begin{align*}
-C:C,\rightarrow (s,č,\overset{o}{\circ}č,+ik)
\end{align*}
\]

**THIRD CYCLE:** \((s,č,\overset{o}{\circ}č,+1k+\overset{o}{\circ}) \rightarrow u:o \rightarrow (s,č,\overset{o}{\circ}č,+k+\overset{o}{\circ})\)
ČOEČEK: \(((skek)+1k)+u\)

**FIRST CYCLE:**

**SECOND CYCLE:** as above

**THIRD CYCLE:**

\[
\begin{align*}
-s: & s & -u:o- & (s, č, ĩč, +ek+u) \\
-u: & o- & (s, č, ĩč, +ek) & -e:o- & (s, č, ĩč, +ok) \\
\end{align*}
\]

MEŠOČKA: \(((měx)+1k)+1k\)

**FIRST CYCLE:** (měx) \(→\) \(c:c,->\) \(m, ěx\)

**SECOND CYCLE:** (m, ěx+1k) \(→\) \(k:č-\) \(m, ěš+1k\) \(→\) \(c:c,->\)

(m, ěš, +1k) \(→\) \(u:o-\) \(m, ěš, +ek\) \(→\) \(e:o-\) \(m, ěš, +ok\)

**THIRD CYCLE:** (m, ěš, +ok+1k) \(→\) \(k:č-\) \(m, ěš, +ok+1k\)

\(→\) \(c:c,->\) \(m, ěš, +ok, +1k\)

**FOURTH CYCLE:** (m, ěš, +ok, +1k) \(→\) \(u:o-\) \(m, ěš, +ok, +k+č\)

MEŠOČEK: \(((měx)+1k)+1k\)+u

**FIRST CYCLE:**

**SECOND CYCLE:** as above

**THIRD CYCLE:**

**FOURTH CYCLE:** (m, ěš, +ok, +1k+u) \(→\) \(u:o-\) \(m, ěš, +ok, +ek+u\)

\(→\) \(u:o-\) \(m, ěš, +ok, +ek\) \(→\) \(e:o-\) \(m, ěš, +ok\)

In the light of our proposed formulation of rule \((e:o)\), it is necessary now to examine cases where \((e:o)\) does not apply because the underlying \(e\) is followed by a sharp consonant.
Adjectives with the suffix -SK- (from isk) contrast with adjectives in -N- (from in) (cf. p. 144 fn 4). The adjectives ЖЕНСКИЙ 'female, woman-like', ЗЕМСКИЙ 'pertaining to the Zemstvo', СЕЛСКИЙ 'rural', for example, are not derived from the underlying nouns stems of the nouns ЗЕНА (pl. ЗЕНИ 'wife', ЗЕМЛЯ 'land, earth', СЕЛО [pl. СЕЛА] 'village'. This is clear both from the semantic difference (if ЖЕНСКИЙ were derived from the noun stem in ЗЕНА, it would mean 'wife-like'; similarly, ЗЕМСКИЙ would mean 'of the land, earthen', СЕЛСКИЙ would mean 'of a village') and from the root stress (if ЖЕНСКИЙ were derived from the noun stem in ЗЕНА, it would show end stress, *ЖЕНСКОЙ; similarly for *ЗЕМСКОЙ; *СЕЛСКОЙ). ЖЕНСКИЙ, ЗЕМСКИЙ, and СЕЛСКИЙ, then, are primary adjectives with the structures ((ген+иск)+oj), ((зем+иск)+oj), and ((сел+иск)+oj). The derivation of ЖЕНСКИЙ:

FIRST CYCLE: 
(gен+иск) \(\rightarrow\) к:ч \(\rightarrow\) (жен+иск) \(\rightarrow\) -о:ц, \(\rightarrow\) (зен+,иск) 
-e:o-Exc \(\rightarrow\) (зен+,иск) \(\rightarrow\) e:o \(\rightarrow\) inapplicable

SECOND CYCLE: (жен+,иск+oj) \(\rightarrow\) -u:o \(\rightarrow\) (жен+,ск+oj)

In nouns like ЗЕМЛЯ (acc. sg. ЗЕМЛЯ; but cf. ЧЕРНОЗЕМ), ПЕРЯ (but cf. ПЕРЯСКО), ВЕСЕЛЫ (but cf. ВЕСЕЛЫ) etc., the

---

noun stem contains a suffix which sharpens the preceding consonant on the first cycle:

**ZEMJU:** \(((z\ddot{e}m+1)+\ddot{o}m)\)

**FIRST CYCLE:** \((z\ddot{e}m+1) \rightarrow (z,\ddot{e}m,+1) \rightarrow e:o-exc \rightarrow (z,\ddot{e}m,+1) \rightarrow e:o \rightarrow \text{inapplicable}\)

**SECOND CYCLE:** \((z,\ddot{e}m,+1+\ddot{o}m) \rightarrow u:w \rightarrow (z,\ddot{e}m,+j+\ddot{o}m) \rightarrow VN[once] \rightarrow (z,\ddot{e}m,+j+\ddot{u}m) \rightarrow j:l \rightarrow (z,\ddot{e}m,+l,+\ddot{u}m) \rightarrow N;o \rightarrow (z,\ddot{e}m,+l,+\ddot{u})\)

**PER'JA:** \(((p\ddot{e}r+i+1)+\ddot{o})\)

**FIRST CYCLE:** \((p\ddot{e}r+i+1) \rightarrow u:w \rightarrow (p\ddot{e}r+i+1) \rightarrow \ddot{u}:u \rightarrow (p\ddot{e}r+i+1) \rightarrow C:C \rightarrow (p\ddot{e}r+i+1) \rightarrow e:o-exc \rightarrow (p,\ddot{e}r,+i+1) \rightarrow e:o \rightarrow \text{inapplicable}\)

**SECOND CYCLE:** \((p,\ddot{e}r,+i+1+\ddot{o}) \rightarrow u:o \rightarrow (p,\ddot{e}r,+j+\ddot{o})\)

Verbs like **GRÉZIT** 'to (day-)dream' are derived from roots with the help of the verb suffix \(\ddot{I}\).\(^8\) Infinitive forms have no internal structure and show derivations of the following type:

**GREZIT':** \((gr\ddot{e}z+i+t\ddot{I}) \rightarrow (C:C,),(\ddot{I}+:1#),(u:o) \rightarrow (g,r,\ddot{e}z,+i+t,) \rightarrow e:o-exc \rightarrow (g,r,\ddot{e}z,+i+t,) \rightarrow e:o \rightarrow \text{inapplicable}\)

---

\(^8\)The noun **GRÉZA** '(day-)dream' is a deverbal formed from the structure \(N(\text{NS(gréz)_NS + \ddot{o}})_N\). Note that in prep. sg. rule (e:o) will apply, even though the consonant following e is sharp in phonetic representation [gr,\(\ddot{e}z,1\)].
PROČEST': (pro#kít+tı) → k:č→ (pro#čít+tı) → ĺ:č→ (pro#č,ít,+t,1) → ĺ#:#1#→ (pro#č,ít,+t,1) → u:č→ (pro#č,ét,+t,1) → e:o→ exc→ (pro#č,ét,+t,) → e:o→ inapplicable
→ ĺ:č→ (pro#č,és,+t,)

Verbs like STRĖMIT' 'to stand on guard' are denominals (cf. STRĖMA 'guard duty') and thus have the structure

\[ V(\text{NS(strēm)}_{\text{NS}} + \text{Ī} + \text{tĪ})_V \]

In this form rule (e:o) applies on the first cycle, before the consonant following ĺ can be sharped.

The generic adjective PĖSIJ 'of dog' is derived from the generic adjective stem (pís+ǐı). The suffix īı in the adjective thus functions phonologically in the same way as the nominal ī suffix in PER'JA, VESEL'E, SOLOVEJ etc. The nominative endings for generic adjectives are substantive endings; the oblique case endings are regular adjective endings. In nom. masc. sg., the suffixal ī is lowered by application of (u:o); in the other case forms this ī is dropped on application of rule (u:ō):

nom. masc. sg. PESIJ: ((pís+ǐı)+u)
nom. fem. sg. PES'JA: ((pís+ǐı)+ō)
gen. masc. sg. PES'EGO: ((pís+ǐı)+cvo)

Nouns with ė preceding the suffix -NIK generally fail to undergo (e:o): LĖDNIK 'refrigerator' (cf. LĘD 'ice'), PERĖĐNIK
'apron' (cf. PERÉD 'front'), BERÉZNÍK 'dense birch forest' (cf. BERÉZA 'birch') etc. The noun KOLÉSNÍK 'wheel-wright' fails to undergo (e:o) even though the adjective KOLÉSNÝ 'wheel' does. The suffixes in+īk, which underlie -NIK are, like the suffixes i and įi mentioned on pages 149-150, added to the bare root. The status of the morpheme in in -NIK is not clear to us, but it hardly seems reasonable that nouns in -NIK should be derived from the stems underlying adjectives in -NYJ, even though both forms are derived with the help of a suffix which has the same phonological shape.

The proposed underlying representation of KOLÉSNÍK, ((kol+ěs+in+īk)+u), typifies the representations of nouns in -NIK. The derivation:

FIRST CYCLE: (kol+ěs+in+īk) →(kol, +ěs, +in, +īk)
SECOND CYCLE: (kol, +ěs, +in, +īk+u) →(kol, +ěs, +n, +īk)

Several nouns in -NIK, however, do show the shift of e to o. Forms like ČERTĚZNÍK 'draftsman', TRĚŠNÍK 'three rouble note' etc. are regular because the rule which desharps the palatal continuants Ɥ Ɥ will apply before rule (e:o).\(^9\) Two other nouns in -NIK which show o < e are derived by adding the suffix -NIK to a stem rather than a root: -ČMNÍK,\(^10\) ODNOPOMĚTNÍK

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\(^9\) Cf. X.3. Note that {-R} forms like MJATĚZNÍK 'rebel, insurgent' will not undergo (e:o).

\(^10\) NĚMNÍK 'hireling', PRIĚMNÍK 'radio set', POD"ĚMNÍK 'elevator' etc. The two forms VOSPRIĚMNÍK 'godfather' and PRE-
'puppies born from a single litter'; the presence of prefixes in these forms points to their deverbal origin (cf. the corresponding verbs in -NJAT'/-NIMAT' and the verb POMETIT'/POMEŠAT' 'to date'). We will derive NAĖMNİK and POMĖTNİK, then, from the following structures: ((na#(IM)+in+Ikk)+u) and ((po#(mēt)+in+Ikk)+u). Rule (e:o) will thus apply on the first cycle. The remaining nouns in -NIK with o < e are TĒMNĪK 'spider which spins a web', ĖRNĪK 'debauchee, rake', and PSĒNNĪK 'millet pudding'.

Adjectives in -EL'NYJ pose a problem in analysis. The one adjective with -Ė-, KOSTĔL'NYJ 'of the Polish Roman Catholic church' (cf. KOSTĖL, gen. sg. KOSTĖLA 'Polish Roman Catholic church') is easily derived according to the analysis proposed thus far, but adjectives like VESĔL'NYJ 'of oars', NOVOTĔL'NYJ 'newly calved' etc. do not at first glance seem to be susceptible to the treatment we have suggested.

The adjectives in -EL'NYJ are of five types (the following comprises a complete list of these adjectives):

(i) adjectives derived from noun stems which undergo (Ø:E):
VESĔL'NYJ 'of oars'; cf. VESLO (gen. pl. VĖSEL) 'oar'
KORABĔL'NYJ 'ship'; cf. KORABL' 'ship' (see p. 143)
ZEMĔL'NYJ 'of earth'; cf. ZEMĻJA (gen. pl. ZEMĔL') 'earth'

ĖMNİK 'successor' are {-R} forms (cf. pp. 114, 116, respectively).

11 We will see in section 3 below that two of these adjectives pose a real problem, but not the one considered here.

12 The underlying representation is (((kostēl)+in)+oj).
KOTÉL'NYJ 'boiler'; cf. KOTÉL (gen. sg. KOTŁA) 'boiler'
METĖL'NYJ 'broom'; cf. METŁA (gen. pl. METEL) 'broom'

We will discuss these adjectives in section 3 below.

(ii) adjectives derived from the class of morphemes mentioned in the footnote on page 143; rule (e:o) is inapplicable to these forms (cf. Chapter XIV):
ARTĖL'NYJ 'artel'
SINĖL'NYJ 'chenille'
PASTĖL'NYJ 'pastel'
KAPITĖL'NYJ 'capital'
OTĖL'NYJ 'hotel'

(iii) adjectives in which e is derived from +T ė and therefore may not undergo application of (e:o):
SKUDĖL'NYJ 'fragile, weak, frail'; cf. SKUDET' (masc. past SKU-
DĖL) 'to grow scanty, poor, weak'
{0-, OT-, PRO-}BĖL'NYJ; cf. BĖLYJ 'white'
VERTĖL'NYJ 'used for boring, drilling'; cf. VERTĖT' (masc. past
VERTĖL) 'to twist, turn round and round'
SOPĖL'NYJ 'pipe, fife'; cf. SOPĖŁKA 'pipe, fife'
NATĖL'NYJ 'worn next to the skin'; cf. TĖLO 'body'
SAMOSTRĖL'NYJ 'self-firing'; cf. SAMOSTRĖL 'cross-bow; man with self-inflicted wound'

(iv) adjectives derived from nouns whose stem final consonant is sharp (cf. XI.1); some of these adjectives may have tense ė or be from {+S} roots and thus be doubly or trebly excluded from application of (e:o);
POSTĖL'NYJ 'bed'; cf. POSTĖL' (gen. sg. -ELI) 'bed'
KOŠĖL'NYJ 'swing'; cf. KOŠĖLI 'swing'
XMĖL'NYJ 'intoxicating, intoxicated'; cf. XMĖL' (gen. sg. XMĖ-LJAJ) 'intoxication'
SVIRĖL'NYJ 'pipe, fife'; cf. SVIRĖL' (gen. sg. -ELI) 'pipe, fife'
KISĖL'NYJ 'kissel'; cf. KISĖL' (gen. sg. -ELJAJ) 'kissel'
MOSKATĖL'NYJ 'chandlery'; cf. MOSKATĖL' (gen. sg. -ELI)
KANITĖL'NYJ 'long-drawn-out'; cf. KANITĖL' (gen. sg. -ELI) 'long-drawn-out proceedings'

( v ) two adjectives which, like KOSTĖL'NYJ, are derived from roots containing -TEL'-NYJ 'related to the cultivation and breeding of bees' (cf. POŠĖLÁ [pl. POŠĖLY] 'bee') and -TEL'-NYJ (in the forms NOVOTĖL'NYJ, SKOROTĖL'NYJ, and STĖL'NYJ) 'calfing, calved' (cf. OTĖL 'calving'). For these adjectives we have no satisfactory account. Deeper analysis into the processes of derivational morphology may show some reason for deriving these two adjectives from unstructured forms: ((pėl+in)+oj) and ((tėl+in)+oj), respectively. In this connection, cf. KRASNODERĖVNYJ : KRASNODERĖVNYJ and KRASNODERĖVNYJ et al. mentioned immediately below.

We give some isolated forms in which rule (e:o) does not apply correctly:

VERTKIJ - VERTČE and VERTČE
LEGKIJ - LEGČE
GRĖŽIT' - GRĖŽU (cf. GRĖZA)
TĖŠCA
TĖTJA
ČESAT' - ČESUT (cf. ČESAN)  
BREXAT' - BREŠUT (cf. BRĘX)  
KOLJÁSKA  
REŠETČATYJ and REŠETČATYJ  
KRASNODERÉVEC  
KRASNODERÉVEC and KRASNODERÉVEC  
BELODERÉVEC and BELODERÉVEC  
KRASNODERÉVNYJ and KRASNODERÉVNYJ (but only BELODERÉVNYJ)

3. If we reconsider now the gen. pl. and short masc. adj. forms mentioned above in section 1, we can see that the cyclic process accounts for the sharpening of consonants preceding this inserted vowel and for the replacement of the vowel by ə before non-sharp consonants, even though the insertion rule applies after (C:C,) and (e:o). We will revise the insertion to occur not before word boundary but before any constituent boundary. In order not to derive a vowel in forms which do not show the "zero" ending (gen. sg. ORLA, nom. sg. METLA, nom. sg. REBRO etc.), we will insert not -T, non-diffuse vowels, but -T diffuse vowels:

$$(\emptyset:I) \text{ Insert } \begin{array}{c} [+\text{vocal} \\ -\text{cons} \\ +\text{diff} \\ -\text{T} \\ -\text{grave} \end{array} / \begin{array}{c} [+\text{cons} \\ -\text{comp} \\ +R \end{array} \begin{array}{c} [-\text{obstr}] \\ +\text{cons} \end{array}$$
OREL: ((orl)+u)

FIRST CYCLE: (orl) \( \rightarrow \emptyset : I \rightarrow \) (oril)
SECOND CYCLE: (oril+u) \( \rightarrow \mathrm{C}: \mathrm{C}, \rightarrow \) (or,il+u) \( \rightarrow u:o \rightarrow \)
(or,el+u) \( \rightarrow u:o \rightarrow \) (or,el) \( \rightarrow e:o \rightarrow \) (or,ol)

ORLA: ((orl)+o)

FIRST CYCLE: as above
SECOND CYCLE: (oril+o) \( \rightarrow \mathrm{C}: \mathrm{C}, \rightarrow \) (or,il+o) \( \rightarrow u:o \rightarrow \)
(or,ol+o)

Derivatives of nouns which undergo (\( \emptyset : I \)) also show this inserted vowel in phonetic representation, but only if the following suffix contains a \( -T \), diffuse vowel in the underlying representation. These forms are automatically accounted for by the revised formulation of the insertion rule. Examples:

VETEROK 'light breeze': (((uetr)+uk)+u)

FIRST CYCLE: (uētr) \( \rightarrow u:w \rightarrow \) (wētr) \( \rightarrow \mathrm{C}: \mathrm{C}, \rightarrow \) (w,ētr)
\( \rightarrow e:o \rightarrow \) inapplicable \( \rightarrow \emptyset : I \rightarrow \) (w,ētir)
SECOND CYCLE: (w,ētir+uk) \( \rightarrow \mathrm{C}: \mathrm{C}, \rightarrow \) (w,ēt,ir+uk) \( \rightarrow u:o \rightarrow \)
(w,ēt,er+uk) \( \rightarrow e:o \rightarrow \) (w,ēt,or+uk)
THIRD CYCLE: (w,ēt,or+uk+u) \( \rightarrow u:o \rightarrow \) (w,ēt,or+ok+u)
\( \rightarrow u:o \rightarrow \) (w,ēt,or+ok)

METEL'SČIK 'sweeper': (((metl)+isk+Īk)+u)

FIRST CYCLE: (metl) \( \rightarrow \mathrm{C}: \mathrm{C}, \rightarrow \) (m,etl) \( \rightarrow e:o \rightarrow \)
(m,otl) \( \rightarrow \emptyset : I \rightarrow \) (m,otil)
SECOND CYCLE: (m,otil+isk+Īk) \( \rightarrow k:\emptyset \rightarrow \) (m,otil+isčĪk)
- 157 -

\[-C:o, \rightarrow (m,ot,il,+is,\ddot{c},+\dddot{i}k) \rightarrow u:o-\]

\[(m,ot,el,+is,\ddot{c},+\dddot{i}k) \rightarrow s:~ (m,ot,el,+i\ddot{e},\ddot{c},+\dddot{i}k)\]

THIRD CYCLE: \[(m,ot,el,+i\ddot{e},\ddot{c},+\dddot{i}k+u) \rightarrow u:o-\]

\[(m,ot,el,+i\ddot{e},\ddot{c},+\dddot{i}k)\]

We can now explain the non-application of \((e:o)\) to the adjective forms mentioned above on pages 152-153:

METEL'NYJ: \(((met+l)+in)+oj)\]

FIRST CYCLE: \[(met+l) \rightarrow C:C, \rightarrow (m,et+l) \rightarrow e:o- (m,ot+l)\]

\[\rightarrow \emptyset:I- (m,ot+il)\]

SECOND CYCLE: \[(m,ot+il+in) \rightarrow C:C, \rightarrow (m,ot,il,+in)\]

\[\rightarrow u:o- (m,ot,+el,+in) \rightarrow e:o-exc- (m,ot,+el,+in)\]

\[-e:o- inapplicable\]

THIRD CYCLE: \[(m,ot,+el,+in+oj) \rightarrow u:o- (m,ot,el,+n+oj)\]

Two of these adjectives, ZEMEL'NYJ and KORABEL'NYJ present problems which we cannot solve. ZEMEL'NYJ must be derived from \(((zem+l)+in)+oj)\). The noun suffix \(l\) will never undergo application of \((u:w)\) because we have restricted this rule so that it does not apply to \(l\) before \(l\) (cf. p. 122). Hence this \(l\) will drop on application of \((v:\emptyset)\), deriving, ultimately z,emnoj, an existing form \((ZEMNOJ)\), but not the one in question. Even if we permitted \(l\) in this form to undergo \((u:w)\), we would not derive a correct phonetic representation:
FIRST CYCLE: (zem+1) \(-C:C,\rightarrow (z,em,+1)\)
SECOND CYCLE: (z,em,+1+in) \(-u: w\rightarrow (z,em,+j+in) \rightarrow j:l\rightarrow (z,em,+l,+in) \rightarrow \emptyset: I\rightarrow inapplicable\)

It is clear that we want to derive ZEMEL'NYJ from the noun stem (zem+j).\(^{14}\) Since I can think of no way to arrive at such a representation, I leave the problem unsolved. Similar remarks, of course, hold for KORABEL'NYJ.

4. We turn now to review briefly the constituent structure which we have imposed on underlying representations. For the major constituents (nouns, adjectives, and verbs), we have required the following constituent structure for simplex forms:

noun: \(N^\left(\text{stem}(\text{ROOT} + \text{NOUN SUFFIX})_{\text{stem}} + \text{ENDING}\right)_N\)
adj.: \(A^\left(\text{stem}(\text{ROOT} + \text{ADJ. SUFFIX})_{\text{stem}} + \text{ENDING}\right)_A\)

\(^{14}\)Thus we want the underlying representation (((zem+j) +in)+oj) and the following derivation:

FIRST CYCLE: (zem+j) \(-C:C,\rightarrow (z,em,+j) \rightarrow j:l\rightarrow (z,em,+l,) \rightarrow \emptyset: I\rightarrow (z,em,+il,)
SECOND CYCLE: (z,em,+il,+in) \(-u:o\rightarrow (z,em,+el,+in)
THIRD CYCLE: (z,em,+el,+in+oj) \(-u:\emptyset\rightarrow (z,em,+el,+n+oj)\)
pres.: \( V(\text{stem (ROOT + VERB SUFFIX + PRES.)_stem + ENDING})_V \)
past: \( V(\text{stem (ROOT + VERB SUFFIX + PAST)_stem + ENDING})_V \)

We assume that the "endings" are introduced transformationally. As can be seen from the above, the verbal forms are derived from the stem (ROOT + VERB SUFFIX + TENSE), where TENSE is to be rewritten as PRESENT or PAST. To account for the lack of structure in infinitive forms, we assume that the underlying structure for all verb forms is

\[
\text{(ROOT + VERB SUFFIX + \{TENSE\})_INF}
\]

If TENSE is not chosen, INF must be.

If the form in question is derived (ZVEZDNYJ 'starry', PESIK 'dear, little dog', BERÉZINA 'dense birch forest' etc.), then the stem from which the form is derived (the noun stems (zuezd), (pis), (berz) in ZVEZDNYJ, PESIK, BERÉZINA) is also a constituent. In Chapter XI we will show that diminutive forms must be derived from simplex noun stems in order to predict the sharpening of the stem final consonant (sharp in GUSEK 'dear, little goose', non-sharp in UZELOK 'dear, little knot' etc.). In VĚSTNYJ 'honest', the adjective must be derived from the noun stem which underlies the noun ČEST 'honor' in order to account for the non-application of (e:o):

\[15\] Details, see Chomsky, "Categories and Relations in Syntactic Theory."
ČESTNYJ: ((kést)+in)+oč\(^{16}\)

FIRST CYCLE: \(\text{NS}(kést)_{\text{NS}} \rightarrow k:č \rightarrow \text{NS}(čest)_{\text{NS}}\)

- sharpening of stem final consonants - \(\text{NS}(čes,t,)_{\text{NS}}\)

- e:o-exc \(\rightarrow \text{NS}(čes,t,)_{\text{NS}} \rightarrow e:o \rightarrow \text{inapplicable}\)

---

\(^{16}\)Actually, the noun stem is from (kìt+t); cf. the irregular verb ČTIT' (1 sg. ČTU, 3 sg. ČTIT, 3 pl. ČTUT and ČTJAT) 'to honor, revere', where the root vowel drops on application of rule (u:∅).
IX. MORE ON THE VOWEL SYSTEM.

1. Diphthongs.

On pages 36-41 we showed that phonetic [u] in forms like KUET, ŻUET, TORQUET etc. is best represented by the diphthong ou/eu. We propose the following rule to derive ū from this representation:

\[(VV;\bar{V})_+^S \quad V\ V \quad \rightarrow \quad \left[ \begin{array}{c} 2 \\ +\text{tense} \end{array} \right] \]

Rule \((VV;\bar{V})_+^S\) serves the purpose of deriving [ū] from ou/eu in a very straightforward manner. If \((VV;\bar{V})\) applies after (V-redund), we can avoid any possibility of confusing phonetic [y] (from underlying ū) with phonetic [ū] (from underlying ou/eu). Thus the derivations of ŻUET, from ((geu+ď+ǭ)+t), and of DYM 'smoke', from ((dūm)+u), for example, are as follows:

---

Halle, The Sound Pattern of Russian, pp. 30, 59, cites a few forms which show phonetic VV clusters where no prefix+root boundary seems to intervene: PAUK 'spider', KLJAUZA 'slander', TIUN 'feudal governor'. PAUK, KLJAUZA, and TIUN (which Ušakov cites as alternating with TIVUN) will be treated with forms like MUĐŽIN 'muezzin' (Chapter XIV), and are redundantly marked as not undergoing \((VV;\bar{V})_+^S\). OPLEUXA 'slap in the face, box on the ear' might be related to UXO 'ear'; in this case the -EU- cluster will be separated by a # marker. In any case, it is not clear how OPLE in this form should be represented.
FIRST CYCLE:  (geu+ö+ê)  \( \overline{V}:j \rightarrow (\text{geu}+j+ê) \rightarrow k:\ddot{c} \rightarrow \\
(\dddot{j},\text{eu}+j+ê)  \rightarrow C:C, \rightarrow (\dddot{j},\text{eu}+j+ê) \rightarrow e:o[once] \rightarrow \\
(\dddot{j},\text{eu}+j+ê)  \\
SECOND CYCLE:  (\dddot{j},\text{eu}+j+ê+t)  \rightarrow \text{Vreund} \rightarrow (\dddot{j},\varepsilon U+j+ê+t) \\
\rightarrow (VV:\overline{V})_S \rightarrow (\dddot{j},\ddot{u}+j+ê+t) \\

FIRST CYCLE:  (\ddot{d}ûm)  [no rules apply] \\
SECOND CYCLE:  (\ddot{d}ûm+u)  \rightarrow u:\emptyset \rightarrow (\ddot{d}ûm) \rightarrow \text{Vreund} \rightarrow \\
(\ddot{d}\ddot{y}m) \\

In order to prevent (\dddot{I}#::i#) of page 136 from applying to the final vowel in forms like ŽEVALI, KNĪGI etc., we will postulate an underlying eï. Rule (VV:V)_S will then derive phonetic [\dddot{I}] from this abstract representation:

ŽEVALI:  ((geu+ö+ê)+eï) \\
FIRST CYCLE:  (geu+ö+ê)  \rightarrow u:w \rightarrow (geu+ö+ê) \rightarrow k:\ddot{c} \rightarrow \\
(\ddot{j}ew+ö+ê)  \rightarrow C:C, \rightarrow (\ddot{j},\text{ew}+ö+ê) \rightarrow e:o \rightarrow \\
(\ddot{j},\text{ow}+ö+ê)  \\
SECOND CYCLE:  (\ddot{j},\text{ow}+ö+ê+eï)  \rightarrow C:C, \rightarrow (\ddot{j},\text{ow}+ö+ê+eï) \\
\rightarrow \text{Vreund} \rightarrow (\ddot{j},\text{ow}+ö+ê+eï) \rightarrow \dddot{I}#::i# \rightarrow \text{inapplicable} \\
\rightarrow (VV:\overline{V})_S \rightarrow (\ddot{j},\text{ow}+ö+ê+I) \\

The necessity for postulating the three diphthongs ou eu eï suggests the presence of a fourth diphthong, oï, and, indeed, we find a clear need for this diphthong in the prep. sg. ending, for velar stems fail to undergo (k:\ddot{c}) before this phonetic front
vowel: BOGE, ZVUKE, GREXE etc., and not *BOGE, *ZVUKE, *GREXE. Rather than postulate an underlying ə preceded by a special boundary marker to prevent application of (k:ɔ), we can postulate əi for this ending: ((bog)+o1), ((zuon+k)+o1), and ((grēx)+o1) etc.

Rule (VV:V)+S, however, cannot be permitted to apply to the representation əi, because it would incorrectly derive phonetic [I] (i.e., incorrect phonetic representations such as prep. sg. *[bɔgI], *[zvukI], *[grIxf]). Furthermore, it is clear that the derivation of ə from əi must occur between (k:ɔ) and (C:C,); rule (VV:V)+S, however, must apply after (C:C,). In view of these facts, we postulate the following rule, ordered to apply between (k:ɔ) and (C:C,):

\[
\begin{align*}
(o1:ə) & \quad \rightarrow \\
\begin{bmatrix}
\text{[+vocal]} & \text{[+vocal]} \\
\text{[-cons]} & \text{[-cons]} \\
\text{[+grave]} & \text{[-grave]}
\end{bmatrix}
& \quad \rightarrow \\
\begin{bmatrix}
\text{[-diff]} \\
\text{[+T]}
\end{bmatrix}
\end{align*}
\]

The derivation of prep. sg. GREXE, from ((grēx)+o1), is thus as follows:

**FIRST CYCLE**: (grēx) → C:C, (g,r,ēx)

**SECOND CYCLE**: (g,r,ēx+ə) → k:ɔ → inapplicable → o1:ə→ (g,r,ēx+ə) → C:C, (g,r,ēx, +ə) → e:o→ inapplicable etc.
The fact that imperative forms like PEKÎ! BEREGÎ! etc. fail to undergo (k:ř) suggests that the imperative morpheme might be considered ol. Further motivation for such a proposal comes from the fact that phonetic [I] would be immediately derivable from ol by application of (VV:Ṽ)₃S. If we accepted this analysis, prep. sg. [æ] would have to be derived from #ã as mentioned on page 163. The unappealing rule (ol:æ), however, could then be dispensed with.

This proposal, at first glance more satisfactory than the description using (ol:æ), is untenable. We shall show in X.2 that the diphthong ol must be used in roots underlying such forms as CENA 'price', CELYJ 'whole', CEP 'chain' etc. so that rule (ol:æ) will be needed in any case. Still, one might argue, (ol:æ) could be restricted to apply only before a segment, deriving ã from ol in CENA, CELYJ etc. (on the basis of the segments n and l following ol), and I from ol in PEKÎ! (from pek- ol; in this form no segments follow the diphthong; hence ol → I by application of (VV:Ṽ)₃S). This proposal, however, overlooks the fact that we must postulate imperative I precisely because this terminal I alternates with ı (i.e., with zero), as in GO- VORÎ! PRÎGNI : GÔTOV'). Hence our earlier proposal for the imperative (pp. 135-137) must be used, and the terminal diphthong ol used for prep. sg. as suggested immediately above.

2. The Shift of ą to ę.

The segment ą is fronted after any ă specified [-R] by application of the following rule:
(o:e)  o →  e / \[ j \] ------

PITIÉ (cf. \{+R\} PIT'É): ((pǐi+t+i)⁺⁻)
FIRST CYCLE: (pǐi+t+i)⁻⁻ \text{-u:w[twice]} \rightarrow (pǐj+t+i)⁻⁻
\text{-ū:u} \rightarrow \text{inapplicable} \rightarrow \text{-ō:ō} \rightarrow (p,i_j+t,+i)⁻⁻
SECOND CYCLE: (p,i_j+t,+i_j⁺)⁻⁻ \rightarrow (p,i_j+t,+i_j+ē)⁻⁻
\text{-s:ō} \rightarrow (p,i+t,+i_j+ē) \rightarrow \text{Vreund} \rightarrow (p,i+t,+i_j+ē)

Rule (o:e) must apply after (e:o) and before (Vreund), as shown in the above derivation. A similar derivation holds for instr. sg. PITIÉM (cf. \{+R\} PIT'ÉM). We note that the gen. sg. PITIJA reveals that +T ō may not be fronted, for this would derive *p,īt,i_jē (correct p,īt,i_jō) from ((pǐi+t+i)⁺⁻). The remaining back vowels may or may not be fronted with no difference resulting in the final phonetic representations. It is simplest to front any -T vowel:

(o:e) \[ v \] → [-grave] / \[ i \] ------

The gen. pl. PITIJA, for example, is derived from ((pǐi+t+i)⁺⁻) as follows:
FIRST CYCLE: as above
SECOND CYCLE: \((p, i_{j+t}, +i_j+u) \rightarrow u:∅ \rightarrow (p, i_{j+t}, +i_j)\)
\(→ o:e \rightarrow \text{inapplicable} \rightarrow \text{Vredund, S:∅} \rightarrow (p, i_{j+t}, +i_j)\)

The \{+R\} forms nom. sg. PIT'È, instr. sg. PIT'ÈM, gen. pl. PITÈJ are derived from the same underlying segmental representations as the \{-R\} forms. In the \{+R\} forms, rule \((I#:i#)\) applies to the first vowel of the suffix \(i_i\), and rule \((o:e)\) does not apply to the \(-T\) vowel endings. Note that in KOP'È 'spear', the suffix \(i_i\) must be marked \{+R\}, and that before the rules of akan'e have applied the gen. pl. KOPIJ will be represented \(kopp+ +i_j\). After the rules of akan'e have applied the representation will be \(kopp+i_j\). The spelling \(-IJ\) is after the \{+R\} spelling in PITIJ; it should be spelled KOPEJ, after the \{+R\} spelling in PITÈJ. Here, as elsewhere, the distinction between underlying unstressed e and i is obscured.

One additional set of forms to which \((o:e)\) applies has already been mentioned on page 43: the suffix \(ou\) shows initial e in words like CAREVNA 'tsarevna (daughter of a tsar)', PLACEVNYJ 'lamentable, deplorable, sad', DUSEVNYJ 'sincere, heartfelt' etc. These forms are denominals, derived from the \{-R\} noun stems \((cōr+i), (plōk+i), (doux+i)\) etc.

PLACEVNYJ: (((\(plōk+i\)+ōu)+in)+o)j)  \(-R\)
FIRST CYCLE: \((plōk+i) \rightarrow k:ō \rightarrow (plōō+i) \rightarrow c:ō, \rightarrow \)
\((plōō, +i)\)
SECOND CYCLE: \((\text{plōc}, +i+ōu) \rightarrow \text{u}:\text{w} \rightarrow (\text{plōc}, +j+ōu)\)

THIRD CYCLE: \((\text{plōc}, +j+ōu+in) \rightarrow \text{u}:\text{w} \rightarrow (\text{plōc}, +j+ōw+in)\)

FOURTH CYCLE: \((\text{plōc}, +j+ōw,+in+oj) \rightarrow \text{u}:\emptyset \rightarrow (\text{plōc}, +j+ōw,+n+oj)\)

\((\text{plōc}, +j+ōw,+n+oj) \rightarrow \text{e}:\emptyset \rightarrow \text{inapplicable}\)

\(\rightarrow \text{o}:\text{e} \rightarrow (\text{plōc}, +j+ēw,+n+oj) \rightarrow \text{Vreund} \rightarrow (\text{plāc}, +j+ēw,+n+oj)\)

\(\rightarrow \text{j}:\emptyset \rightarrow (\text{plāc}, +ēw,+n+oj)\)
X. THE PHONOLOGY OF VELARS.

In addition to (k:č), there are two other rules which mutate velars. These rules are rather marginal, as the paucity of examples will show.

1. Rule (BdG).

The following forms show a k A : o ž alternation:

VOSKLIKNUT' : VOSKILICAT' 'to exclaim, cry (pf. : impf.)'
PRONIKNUT' : PRONICAT' (= PRONIKAT') 'to penetrate (pf. : impf.)'
PROREŽ' (I sg. PROREKU) } 'to prophesy (pf. : impf.)
PRONICAT' (= PROREKAT')
KNJAGINJA : KNJAZ' 'princess : prince'
OBLIK : LICO 'look, aspect, appearance : face'
BRJAKAT' : BRJACAT' 'to let fall with a crash/bang, clatter : to clang, clank'
OTTORGAT' : TEBRŽAT'1 'to tear away : to tear to pieces'
TJAGAT'SJA : SOSTJAZAT'SJA 'to bring a lawsuit against, compete with : to compete/contend with'

We will use the following rule (to be modified later) in order to account for alternations like those given above:2

---

1 We shall not attempt to account for the root vowel alternations in these forms.

2 I would like to express my indebtedness to Wayles Browne for his insightful observation which led to the present formulation of this rule.
\[(\text{BdC}) \left\{ \frac{k \bar{g}}{-R} \right\} \rightarrow \left\{ c \ 3 \right\} / \bar{\imath} \left( \left\{ \frac{n}{r} \right\} \right) ^{\imath} \]

Thus, for example, we derive PRONICAT' from the representation \((\text{pro}\#(n\ddot{ik}+\ddot{oi}+\ddot{t}l))\). PRONIKAT' is derived from the same segmental representation, but the root morpheme is marked \(\{+R\}\). In PRONIKNUT', VOSKLIKNUT' etc., rule (BdC) cannot apply because the velar is followed not by \(\ddot{c}\), but by \(\ddot{n}\). We discuss the forms of KNJAZ' 'prince' in X.4, X.5, XI.3.

The necessity for including rule (BdC) in the grammar becomes somewhat more apparent if we consider pairs like the following: KNJAZ' 'prince' and KNJAŽNA (gen. pl. KNJAŽN) 'daughter of a prince'; LICO 'face' and LIČNOJ 'face, facial'; PTICA 'bird' and PTIČIJ 'of bird'; MOLODEC 'stout fellow, good lad' and MOLODOČINA 'stout fellow, good lad'. In these forms (and there are many more like them), we see an apparent \(c \ddot{z} : \ddot{c} \ddot{z}\) alternation. If we derive these forms from velar roots, then the presence of strident dentals in KNJAZ', LICO etc. may be accounted for by application of (BdC) and the presence of strident palatals in KNJAŽNA, LIČNOJ etc. by application of rule \((k:\ddot{c})\)--note that all the suffixes in question begin with a front vowel in their underlying representation:

- KNJAŽNA from \(((\text{kuning}+\text{in})+\ddot{c})\)
- LIČNOJ from \(((\text{l}\ddot{ik}+\text{in})+\ddot{c}j)\)
PTIČIJI from ((put)+Ík)+Îl)+u
MOLOĐČINA from ((mold+1k)+În)+ö
etc.

An examination of the occurrence of the phone [c] shows that it appears only in initial position (CENA, CELYJ etc.), after Ìn (BRJAGAT', from brink), after ı (PTICA), after ı (MOLODEC), or after Ìr (MERCAT' 'to twinkle', from mirk).\(^3\) Rule (BdC) will serve to derive ı from an underlying velar in all these cases except when ı occurs initially (cf. X.2).

The suffixes Ík and Îk have rather unusual behavior with respect to their marking with \{±R\}. When used to form diminutives of velar stems (DRUGOK from DRUG, droug, 'friend', BLOŠKA from BLOXA, blos, 'flea', MOLOŠKO from MOLOKO, melk, 'milk' etc.), the suffix Ík must be marked \{+R\} in order to prevent the application of (BdC) (for typical derivations, see pages 102-104, 146-147; for an apparently equivalent, alternate analysis, see XI.3). Otherwise, the noun suffix Ík (rarely used to form fem. or neut. nouns) is marked \{-R\}, thus undergoing (BdC): masc. MOLODEC, KUPEC etc.; fem. PLY'CA 'pollen', SOL'CA 'dim. of SOL' <<salt>>, DVĚRCA = DVĚRKA 'dim. of DVER' <<door>>; neut. PIVČO = PIVKO 'dim. of PIVO <<beer>>', SLOVČO 'dim. of SLOVO <<word>>', VINOČ 'dim. of VINO <<wine>>'. The suffix Îk undergoes (BdC) only when used to form fem. nouns: L'VIČA 'lioness', JÁGODICA 'buttock',

\[^3\]We are not considering here examples like MYT'SJA [myćo] 'to wash oneself' or AEZAC [abzăc] 'paragraph'. See Chapter XIV.
KNIZICA 'dim. of KNIGA <<book>>', ORLICA 'she-eagle' etc. With masculine and neuter nouns the velar remains intact: masculine: ZJABLIK 'finch', UMNIIK 'clever man' (cf. fem. UMNICA), ČASI 'an hour or so' etc.; neuter (few examples): LUKIKO 'dim. of LICO <<face>>', KOLVEŠIKA⁴ 'dim. of KOLESO <<wheel>>', PLEČIKO 'dim. of PLEČO <<shoulder>>'.

We have already mentioned (p. 123) that the "zero" ending ŭ must have a deeper representation with some vowel other than ŭ. We can see now that this vowel must be o. In order to derive o from k in the suffixes ŭk, all noun endings must begin with the vowel ť.⁵ We give below the declensions of OTEC 'father' and KREPOSTCA 'small, insignificant fort', and beside them the underlying representations of the case endings:

<table>
<thead>
<tr>
<th>Case</th>
<th>Noun</th>
<th>Case</th>
<th>Noun</th>
</tr>
</thead>
<tbody>
<tr>
<td>n.s.</td>
<td>OTEC ox</td>
<td>KREPOSTCA-Á ď</td>
<td></td>
</tr>
<tr>
<td>g.s.</td>
<td>OTE-Á ź</td>
<td>KREPOSTCA-Ý źx</td>
<td></td>
</tr>
<tr>
<td>d.s.</td>
<td>OTE-Ú ou</td>
<td>KREPOSTCA-Ê oi</td>
<td></td>
</tr>
<tr>
<td>a.s.</td>
<td>= gen. sg.</td>
<td>KREPOSTCA-Ú ţm</td>
<td></td>
</tr>
<tr>
<td>i.s.</td>
<td>OTE-ÓM omu</td>
<td>KREPOSTCA-ÓJ (-ÓJU) oi+ţm</td>
<td></td>
</tr>
<tr>
<td>p.s.</td>
<td>OTE-Ê oi</td>
<td>KREPOSTCA-Ê oi</td>
<td></td>
</tr>
</tbody>
</table>

⁴From (((kol+és)+š)+k)+o)

⁵The few exceptions, like -'MI (DOĎ 'daughter': instr. pl. DOĐER'MI), -EJ (XANŽA 'canting hypocrite': gen. pl. XANŽEJ) etc. are not relevant because these endings do not occur with forms that undergo (BdC) (the two exceptions, KNJAZÉJ 'of princes' and DRUŽEJ 'of friends' are treated in X.⁴).
n.p. OTC-Ý ōx
   KREPOSTC-Ý ōx

g.p. OTC-ÓV ou+ōx
   KREPOSTÉC ōx

d.p. OTC-ÁM ōmu
   KREPOSTC-ÁM ōmu

a.p. = gen. pl.
    = nom. pl.

i.p.: OTC-ÁMI ōmíx
    KREPOSTC-ÁMI ōmíx

p.p.: OTC-AX ōxu
    KREPOSTC-AX ōxu

It can be seen that an enormous amount of redundancy exists in the proposed endings; thus the first vowel of all endings is o or ō; the only consonants are nasal m or non-nasal x; the nasal consonant occurs in instr. endings; etc., etc. Since it is not clear to me exactly how these endings are best described,6 or, indeed, if the endings proposed above are entirely correct,7 I shall leave this problem for future investigation. The proposed endings are thus to be taken as suggestive, not definitive.

In order to derive ū from ōx, we require application of the following rule:

(ō:ū) ōx → [+diffuse] / [+cons]#

6I have in mind the binary feature system suggested by Roman Jakobson, "Nabljudenija nad slavjanskim skloneniem."

7Thus, for example, the best solution might be one in which all masc. and neut. sg. endings begin with -T o, all fem. sg. endings with +T ō. The prep. sg. ending would be an excep-
In order to drop desinential final consonants, we generalize rule (N:∅) of page 50:

\[(C:∅) \ [\text{+cons}] \rightarrow ∅ \text{ / } \text{##}\]

Examples:

**OTCY: \[((ot+ik)+ōx)\]**

**FIRST CYCLE:** \((ot+ik) \rightarrow (ot+ik)\)

**SECOND CYCLE:** \((ot,+ik+ōx) \rightarrow (ot,+ic+ōx) \rightarrow (ot,+ic+ūx) \rightarrow (ot,+ic+ū)\)

\((ot,+ic+ū) \rightarrow (C:∅) \rightarrow (ot,+ic+ū) \rightarrow (u:∅) \rightarrow (ot,+c+ū)\)

**KLÊV: \[((kleu)+ox)\]**

**FIRST CYCLE:** \((kleu) \rightarrow (k,l,eu)\)

**SECOND CYCLE:** \((k,l,eu+ox) \rightarrow (k,l,ew+ox) \rightarrow (k,l,ew+ux) \rightarrow (k,l,ew+u) \rightarrow (k,l,ew) \rightarrow (k,l,ow)\)

From the above derivations we can observe that \((u:w)\) now applies to a stem final \(u\) before the "zero" ending (cf. p. 123), and that if \((i#:i#)\) applies before \((C:∅)\), it will not apply to case endings (cf. p. 137).

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To the rule for fem. endings. Masc.-neut. gen. sg. could be specified \(oC\), where \(C \neq m,x\). It is not clear how to handle the bimorphemic fem. instr. sg. ending.
2. Rule (k:c).

On page 170 we observed that $\circ$ may occur in word initial position. There are very few words of this type, and they all begin in CE- or CVE-: CENA 'price', CELYJ 'whole', CEP 'chain', CVESTI (masc. past CVÈL) 'to flower, bloom', CVET 'color; flower' etc. Since there are no words in KVE- or KE-, we may derive forms with initial $\circ$ from an underlying $k$ simply by applying a rule of the following type:

$$(k\!:\!c)\ k \rightarrow \circ / \underline{(w)\ a}$$

3. The Rules for Velar Phonology.

There are several ways to introduce rule (k:c)--or a rule which achieves the same effect--into the grammar we have

---

8In Chapter XIV we shall discuss words like CINK 'zinc', CENTR 'center' etc., which we are not treating here.

9The relation between CVESTI and CVET is not clear to me. For lack of a better solution, we derive both from a single morpheme containing the vowel $-T_e$; the verb will be marked $\{+R\}$, the noun $\{-R\}$. As is explained immediately below, the underlying form of the first segment of this morpheme is $k$; hence the morpheme will be represented segmentally as kuet.

10In Chapter XIV we treat words like KENGURU 'kangaroo', KEDR 'cedar' etc. The dialectal KVELYJ 'weak, puny, soft' is the only real exception we know of.
thus far formulated. In this section we will examine some of
these ways and will show how rule (k:c) can be partially co-
alesced with rule (BdC).

Let us consider first the relation between (k:c) and
(k:ɔ). Since we have already decided to derive forms like ÖE-
RĒD, ÖET, ÖESANNYJ etc. from morphemes which begin with the clus-
ter ke, and forms like ÖAS, ÖAXLYJ 'weak, unhealthy', ÖAD 'fumes'
etc. from morphemes which begin with the cluster kē, it is clear
that [ce] in forms like CEELYJ, CE composed of CE, CENA, CEEDIT 'to strain'
etc. may not be derived from kē. As we mentioned on page 164,
we may derive these from initial koi. In CVESTI, CVET, we may
use underlying ku because the initial velar in this form can-
not undergo (k:ɔ). We must order (k:c) to apply after (o1:ɔ) to
derive CENA from ((koin)+ɔ), and before (e:o) to derive CEEL
'he (it) was blooming' from ((ku+1)+u). Since velars before
original front vowels will have undergone (k:ɔ) before rule (k:c)
applies, we can relax the environment restriction of (k:c) so
that k → c before any front vowel (with the segment w option-
ally preceding the vowel).

We consider now the relation between (k:o) and (BdC). In
order to coalesce these rules we will require that velars under-
going these rules be shifted not immediately to dentals, but to
non-strident palatals:

\[(k:ɔ) \ [k, g, x] \rightarrow [ɔ, ɔ, ɔ] \quad / \quad [-\text{cons}]\]
Integration of these rules with other rules of the grammar permits a simple method of specifying the redundant feature of stridency for all segments. We assume the following early redundancy rule:

\[ X \rightarrow [-\text{strident}] \]

The remaining relevant rules are as follows:\[superscript{11}\]

\[(u:w) \quad [p. 121]\]

\[(kt:k) \quad [+\text{obstr}] \rightarrow \emptyset \quad / \quad [+\text{obstr}]^{+} \quad / \quad [-\text{grave}]\]

\[superscript{11}\]For synchronic and diachronic discussion of the phonology of velars in Russian and other Slavic languages, see Halle and Lightner, "Relative Chronology and the Synchronous Order of Rules."
(tːʰ) [+obstr] → [+comp] / ——— [-vocal]
[-grave]  [-cons]

(kːɕ) [+obstr] → [+strid] / ——— [-cons]
[+comp]  [-grave]

(oːɘ) [p. 163]

(BdG)

( +obs ) → [-grv] / {
[ +comp ]  [-grv]  +voc
[ -cns ]  +cns  +dif
[-dif]  +grv

(kːk)

Where X ≠ #

(öːũ) [p. 172]

(uːo) [p. 117]

(uːø) [p. 34]
\(\varepsilon:\varepsilon\) \(\text{[p. 69]}\)

\[+\text{comp} \quad -\text{grave} \quad +\text{voice}\]
\[\rightarrow \quad [+\text{contin}]. \quad (\text{cf. p. 19})\]

\(\xi:\varepsilon\)

\[+\text{obstr} \quad +\text{comp} \quad -\text{strid} \quad -\text{grave}\]
\[\rightarrow \quad [+\text{strid}]. \quad [-\text{comp}]\]

\(\xi:c\)

\[+\text{strid} \quad <\text{cont} \quad <\text{cmp}>\]
\[\rightarrow \quad [-\text{asharp}] \quad / \quad [-\text{voice}]\]
\[(\text{cf. pp. 21, 151)}\]

Where the angles are used to mean that if the segment in question is non-compact, it must also be non-voiced.

\(\Theta:s\)

\[+\text{obstr} \quad -\text{grave} \quad +\text{contin}\]
\[\rightarrow \quad [+\text{strident}]\]

\(e:o\) \(\text{[p. 145]}\)

\(c:c\)

\[+\text{strid} \quad -\text{grave} \quad -\text{contin}\]
\[\rightarrow \quad [-\text{sharp}]\]

\(s:\varepsilon\) \(\text{[p. 85]}\)
Examples:

OTEC: \((ot+1k)+ox\)

FIRST CYCLE: \((ot+1k) \rightarrow C:C \rightarrow (ot,+1k)\)

SECOND CYCLE: \((ot,+1k+ox) \rightarrow B:O \rightarrow (ot,+1k+ox)\)

\(-\ddot{c}:\ddot{u} \rightarrow (ot,+1k+ux) \rightarrow C:\emptyset \rightarrow (ot,+1k+u) \rightarrow u:o\)

\((ot,+ek+u) \rightarrow u:\emptyset \rightarrow (ot,+ek) \rightarrow k:o \rightarrow (ot,+ec)\)

\(-\ddot{s},:\ddot{s} \rightarrow (ot,+ec) \rightarrow e:o \rightarrow exc \rightarrow (ot,+ec) \rightarrow e:o \rightarrow inapplicable \rightarrow c:c \rightarrow (ot,ec)\)

GEN: \(((koin)+ox)\)

FIRST CYCLE: \((koin) \rightarrow [no rules apply]\)

SECOND CYCLE: \((koin+ox) \rightarrow (\ddot{c}:\ddot{u}) \text{ and } (C:\emptyset) \rightarrow (koin)\)

\(-\ddot{c}:\ddot{e} \rightarrow (k\ddot{e}n) \rightarrow k:k \rightarrow (k\ddot{e}n) \rightarrow C:C \rightarrow (k,\ddot{e}n)\)

\(-k:c \rightarrow (c,\ddot{e}n) \rightarrow \ddot{s},:\ddot{s} \rightarrow vacuous \rightarrow c:c\)

\((c\ddot{e}n)\)

LEŻA (cf. p. 76): \(((\ddot{l}eg+\ddot{e}+\ddot{l})+NC)\)

FIRST CYCLE: \((\ddot{l}eg+\ddot{e}+\ddot{l}) \rightarrow v:\emptyset \rightarrow (\ddot{l}eg+\ddot{l}) \rightarrow k:\ddot{e} \rightarrow (\ddot{l}eg+\ddot{e}+\ddot{l}) \rightarrow C:C \rightarrow (l,\ddot{e}+\ddot{l})\)

SECOND CYCLE: \((l,\ddot{e}+\ddot{l}+NC) \rightarrow VN \rightarrow (l,\ddot{e}+\ddot{e}+\ddot{e}+NC)\)

\(-s:\emptyset \rightarrow (l,\ddot{e}+\ddot{e}+\ddot{o}+c) \rightarrow C:o \rightarrow (l,\ddot{e}+\ddot{o}) \rightarrow \ddot{z}:\ddot{z} \rightarrow (l,\ddot{e}+\ddot{e}+\ddot{e}+\ddot{o}) \rightarrow \ddot{s}:\ddot{s} \rightarrow (l,\ddot{e}+\ddot{e}+\ddot{o}) \rightarrow e:o \rightarrow (l,\ddot{e}+\ddot{e}+\ddot{o})\)
PROŠČE (cf. p. 85): \((\text{proθt}+\text{I}+\text{I})+\text{m}\)

PRE-CYCLE: \((\text{proθt}+\text{I}+\text{I})+\text{m}\) \(-\text{V}:\emptyset\rightarrow (\text{proθt}+\text{I}+\text{u})+\text{m}\)

FIRST CYCLE: \((\text{proθt}+\text{I}+\text{u})\) \(-\text{V}:\text{j}\rightarrow (\text{proθt}+\text{I}+\text{u})\) \(-\text{t}:\text{k}\rightarrow (\text{proθt}+\text{I}+\text{u})\) \(-\text{C}:\text{c}\rightarrow (\text{proθt}+\text{I}+\text{u})\)

SECOND CYCLE: \((\text{proθt}+\text{I}+\text{u}+\text{m})\) \(-\text{V}\text{N}\rightarrow (\text{proθt}+\text{I}+\text{u}+\text{m})\)

\(-\text{C}:\emptyset\rightarrow (\text{proθt}+\text{I}+\text{u})\) \(-\text{j}:\emptyset\rightarrow (\text{proθt}+\text{I}+\text{u})\)

\(-\text{č}:\text{č}→ \text{vacuous} \text{ } -\text{č}:\text{s}\rightarrow (\text{proθt}+\text{I}+\text{u})\)

\(-\text{s}:\text{š}\rightarrow (\text{proθt}+\text{I}+\text{u})\)

4. Rule \((\text{k}:\text{č})\).

We have found the following exceptions to rule \((\text{k}:\text{č})\):

(i) 2/3 sg. and 1/2 pl. of TKAT' 'to weave': TKĕš', TKĕt, TKĕm, TKĕte for the expected *TOŠES', *TOŠT etc. The forms are derived from the pres. stem (tuk+e); cf. PE-ČES', PEČET, MOŽES', MOŽET etc. from the pres. stems (pek+e) and (mog+e), respectively.

(ii) all the plural forms of KNJAŻ' and DRUG: KNJAŻ'JA, KNJAŻEJ etc. and DRUŽ'JA, DRUŽEJ etc. for the expected *KNJAŻ'JA, *KNJAŻEJ, *DRUŽ'JA, *DRUŽEJ etc. These forms are derived from the noun stems (kuning+Ii) and (droug+Ii), respectively; cf. pl. KLOČ'JA 'rags, shreds, pieces' (sg. KLOK), KRJUČ'JA 'hooks' (sg. KRJUK), SU-Č'JA 'boughs' (sg. SUK) from the stems (klok+Ii), (kreuk+Ii), and (souk+Ii), respectively.
(iii) all the forms of CERKOV' 'church' for the expected "ČERKOVA", derived from the noun stem (kirk+uu).

We will account for these exceptional forms in the following manner:

The morphemes underlying CERKOV', KNJAZ', and DRUG will be marked [-rule (k:ɔ)];\(^{12}\) rule (k:ʃ) will then apply to the underlying velars in these forms, deriving ʃ ʒ (ultimately ɕ z). The derivation of gen. pl. KNJAZEJ, for example, is as follows:

KNJAZEJ: ((kuning+ii)+ox)
-\(R\) +\(R\)
- (k:ɔ)

FIRST CYCLE: (kuning+ii) \(-u:w\rightarrow\) (kuning+ii) \(-k:ɔ→ inapplicable\)
- (kun, ın, g, +i j) \(-V N→\)
(kun, ın, g, +i j) \(-S:0→\) (kun, ın, g, +i j)

SECOND CYCLE: (kun, ın, g, +i j+ox) \(-k:ʃ→\) (kun, ın, g, +i j+ox)
- ʊ:ɔ \(-u:ɔ\rightarrow\) (kun, ın, g, +i j+ux) \(-C:0→\) (kun, ın, g, +i j+u)
- ʊ:u \(-u:c→\) (kun, ın, g, +e j+u)
- ʊ:0 \(-u:ɔ→\) (kn, ın, g, +e j) \(-ʃ:ʒ→\) (kn, ın, g, +e j) \(-k:c→\)
(kn, ın, g, +e j) \(-ɔ, :ʃ→ inapplicable\) \(-0:s→ vacuous\)
(kn, ın, g, +e j) \(-ɔ, :ʃ→ inapplicable\)

The morpheme underlying TKĖĘ', TKĖT etc. must be marked [-rule (k:ɔ)]. The present tense of this verb, moreover, does [-rule (k:ʃ)].

\(^{12}\)The morphemes in KNJAZ', DRUG must be marked [-rule (k:ɔ)] only for nominal forms; cf. adj. KNJAŽESKIJ, DRUŽESKIJ, verb KNJAŽIT', DRUŽIT' etc.
not use the verb suffix ーション (cf. p. 68). Thus the derivation of 2 sg. TEES', for example, is as follows:

TEES': ((tuk+e)+xi)
   -(k:ō)
   -(k:ē)

FIRST CYCLE: (tuk+e) →k:ō→ inapplicable →k:ē→
   inapplicable →c:ō,→ (tuk,+e) →e:o→
   (tuk,+ō)

SECOND CYCLE: (tuk,+ō+xi) →k:ō[once]→ (tuk,+ō+ēi)
   →c:ō,→ (tuk,+ō+ēi) →u:ō→ (tk,+ō+ē,) →ē,+:ē→
   (tk,+ō+ē)

5. The Sharpness of Segments Which Have Undergone (BdC).

The sharpness of the segment ーション is determined by application of rules (ē,+:ē) and (c,:ō) (cf. p. 178 and the derivation of OTEG 'father' on p. 179). The sharpness of ーション < ーション < eterangan < ーション, however, is not determined by application of either of these rules. There are very few examples, but those I can find indicate that ーション < ーション is never sharp in verbs, and that it may or may not be sharp in nouns. We have already mentioned (p. 168) the verbs TERZAT' and SOSTJAZAT'SJA, which show non-sharp ーション and are probably best derived from a morpheme in final ーション. There may be more verbs with ーション derived from ーション by application of (BdC), but if so, these verbs all have non-sharp ーション.13 As for the non-verbal forms, we have

13The only verb in -ZJAT' is VJAT', obviously not to be
already mentioned KNJAZ', with sharp \( z \); possibly the forms \( \text{L'GOTA} \) 'privilege, advantage', \( \text{POL'ZA} \) 'use, benefit' and \( \text{NEL'JO} \) 'it is impossible, one cannot' are best derived from the same underlying root, \( \text{lig} \), with \( \text{L'GOTA} \) marked \( \{+R\} \), \( \text{POL'ZA} \) and \( \text{NEL'JO} \)\(^{15}\) marked \( \{-R\} \). If so, we have a noun \( \text{POL'ZA} \) with non-sharp \( z < g \). The number of forms involved is so small that it hardly seems to matter how we account for this sharp : non-sharp alternation, especially in view of the marginal nature of the rule in question, rule (BdC). We have decided to account for the sharpness of the stem final consonant in KNJAZ' by grouping this noun with nouns like KOST', \( \mathring{O} \text{ERV}' \), LEBED' etc.; we discuss these forms in the next chapter. POL'ZA, whether it be best derived from a velar root or not, will not be grouped with KOST', \( \mathring{O} \text{ERV}' \) etc.

derived from a velar root (cf. p. 80).

\(^{15}\)Cf. dial. NEL'GA.
XI. NON-TRANSITIVE AND TRANSITIVE SOFTENING IN THE FINAL CONSONANT OF NOUN STEMS.

1. Non-Transitive Softening.

Nouns like KOST' 'bone' are distinguished from other nouns, both phonetically and morphologically. Phonetically, of course, these nouns show sharp stem final consonants, [kɔs,t,], whereas other nouns need not (LOVLJA from ((lou+1)+o) does, [lɔvl,j]; but STENA 'wall' from ((stẽn)+o) does not, [s,t,ɪnæ]). Morphologically, these nouns show -BJ in gen. pl. (KOSTBJ), whereas other nouns show no phonetic ending at all, or else show -OV/-EV (STENA - STEM, SLOVO - SLOV, LOVLJA - LÓVEL' etc.; or VOLK - VOLKOV, ČAJ - ČAȷV, OBLAKO - OBLAKOV, JABLOKO - JABLOK and JABLOKOV etc.).

We will account for these facts by marking lexical morphemes underlying noun stems as \{+H\}; by rewriting gen+pl as ĕi after \{-H\} stems, ox or ou+ox after \{+H\} stems; and by expanding rule (C:C,) in the following fashion:

\[ (C:C,) \quad \underbrace{C_1 \rightarrow [+\text{sharp}]}_{\{[-\text{cons}\quad[-\text{grave}]} \}
\]

\[ \{[\underbrace{-H}_{\text{NS}}]} \]

\[1\text{We list some of the exceptions in the APPENDIX.} \]
Examples:

KOST': \( N(\text{NS}(kost)_{\text{NS}} + \text{ox})_{\text{N}} \)

FIRST CYCLE: \( \text{NS}(kost)_{\text{NS}} \rightarrow \text{C:C}, \rightarrow \text{NS}(kost)_{\text{N}} \)

NOGA: \( N(\text{NS}(nog)_{\text{NS}} + \tilde{\text{o}})_{\text{N}} \)

FIRST CYCLE: \( \text{NS}(nog)_{\text{NS}} \rightarrow \text{C:C}, \rightarrow \text{inapplicable} \)

KOSTEJ: \( N(\text{NS}(kost)_{\text{NS}} + \text{gen} + \text{pl})_{\text{N}} \rightarrow N(\text{NS}(kost)_{\text{N}} + \tilde{\text{ei}})_{\text{N}} \)

NOG: \( N(\text{NS}(nog)_{\text{NS}} + \text{gen} + \text{pl})_{\text{N}} \rightarrow N(\text{NS}(nog)_{\text{N}} + \text{ox})_{\text{N}} \)

DOMOV: \( N(\text{NS}(dom)_{\text{NS}} + \text{gen} + \text{pl})_{\text{N}} \rightarrow N(\text{NS}(dom)_{\text{N}} + \text{ou} + \text{ox})_{\text{N}} \)

Since we have already decided that case endings generally begin with \( \tilde{\text{o}} \), we might propose that the \( \{\text{-H}\} \) gen. pl. ending be written \( \tilde{\text{oi}} \) and require a rule to front vowels after \( \{\text{-H}\} \) noun stems. We would then derive KOSTEJ from \((\text{kost} + \tilde{\text{oi}})\), and the gen. pl. ending would not be an exception to the rule that case endings begin with \( \tilde{\text{o}} \). Further support for such a move would come from the fact that phonetically all the singular, and the nom. pl. case endings of fem. \( \{\text{-H}\} \) noun stems begin with a \([\text{-cons} \text{-grave}]\)
segment,² the rule for fronting vowels would account for this fact.

There are several reasons for not incorporating such a fronting rule in the grammar. In the first place, the dat., instr., and prep. pl. endings are not fronted (KOSTJAM [kas,t,ám], KOSTJAMI, [kas,t,ám,i], KOSTJAX [kas,t,áx]),³ and in the second place the non-fem. endings are not fronted except in nom. pl.: g.s. DNJÁ [d'nuá], d.s. DNJU [d'nuú] etc.; n.p. DNI [d'nuí].

²Thus from KOST', for example: g.s., d.s., p.s., and n.p. KOSTI, i.sg. KOST'JU.

³The endings are, of course, somewhat fronted, d.pl. [kas,t,ám], p.pl. [kas,t,áx], i.pl. [kas,t,ám,i]. This fronting, however, occurs after the application of (Vredund) and has nothing to do with the fact that the a occurs in endings; cf. MJAT [m,Át], SADE [sád,i], PJAT' [p,Át,], where the same fronting occurs in roots. According to Jakobson, "Review of Introduction to Russian by George L. Trager," p. 124, four degrees of fronting can be observed for this vowel: the most fronted vowel "is pronounced in Russian only between two softs—vzjátj, somewhat farther back in sequences like vzját, njiljzjá, still farther back when between a preceding hard and subsequent soft consonant—skazátj, zhátj, zhárjítj, and farthest back—out of the vicinity of softs—át, zát, zhát, kazá."
On the other hand, if we compare the prep./loc. sg. ending of the \{-H\} fem. nouns with the prep. sg. ending of other nouns, we see that the distinction between the endings need be only in the gravity of the first segment: \textit{ei} for \{-H\} fem. nouns and \textit{oi} for other nouns (O KÓSTI, V KÓSTI, O RÝSI, NA RÝSI etc. vs O DNE, NA STEňE etc.). Moreover, we have already included in the grammar a rule which fronts -T vowels (rule (o:e) of page 165).

Our solution to this problem will be to expand rule (o:e) to read as given below, but to leave gen. pl. \textit{eI} as one of the exceptions to the rule that case endings begin with the vowel \textit{o}.

\[
\begin{align*}
(o:e) & \ V \to \ [-\text{grave}] \ / \\
& \{ [-\text{J}] \}, \ \{ [-\text{H}] \} \ + \ {+[\text{fem}]} \\
\end{align*}
\]

prep. sg. KOSTI: ((kost)+oi) \\
+\text{fem} \\
-H

FIRST CYCLE: 
(kost) \rightarrow \text{C:C,} \rightarrow \ (kos,t,) \\
+\text{fem} \\
-H

SECOND CYCLE: 
(kos,t, +oi) \rightarrow o:e \rightarrow \ (kos,t, +ei) \\
+\text{fem} \\
-H

\rightarrow (VV: \overline{V}) +S \rightarrow \ (kos,t, +\overline{I})

The phonetic front vowels in gen. sg. and nom. pl. (both from \textit{ňx}-cf. pp. 171-172) will be derived by application
of the following rule (cf. also pp. 208-209):

\[
\begin{align*}
(y:1) & \quad \left[ +\text{voc} \right] \to \left[ -\grave{\text{a}} \text{grave} \right] / \left[ +\text{cons} \right] \\
& \left[ -\text{flat} \right] \left[ +\text{diff} \right]
\end{align*}
\]

\[
\text{g.v.} \quad \text{KOSTI: } ((\text{k}o\text{št})+\ddot{o}x) \quad -H
\]

\text{FIRST CYCLE: } (\text{k}o\text{št}) \quad -C:C, \to \quad (\text{k}o\text{s}t, t) \quad -H

\text{SECOND CYCLE: } (\text{k}o\text{s}t, t, +\ddot{o}x) \quad -\ddot{\text{u}}: \to \quad (\text{k}o\text{s}t, t, +\ddot{u}s)

\quad -C:Q \to \quad (\text{k}o\text{s}t, t, +\ddot{u}) \quad -\text{Vredund} \to \quad (\text{k}o\text{s}t, t, +\ddot{y})

\quad -y:1 \to \quad (\text{k}o\text{s}t, t, +\ddot{y})

2. Transitive Softening.

2.1 Velar Stems.

An examination of the final segment of \{-H\} nouns shows that while none of these nouns are in phonetically sharp velars,\(^4\) many of them are in strident palatals:\(^5\) KARANDAS\' 'pencil', STOROŽ

---

\(^4\)That is to say, there are no nouns with nom. sg. in -K', -G', -X', -KJA, -GJA, -XJA, -KE, -GE, or -XE.

\(^5\)The only neuter nouns of this type are PLEČO (gen. pl. PLEČ and PLEČEJ) 'shoulder', LOŽE 'bed, couch', BEČE 'večer', the
'watchman, guard', TIŞ' 'quiet, silence', LOŢ' 'lie, falsehood', DIOC 'wilderness', KLIČ 'call' etc. Because many of these nouns must be derived from velar stems (cf. TIXO 'quietly', LGAT 'to lie, tell lies', DIKOST 'wildness', KLIK 'call, cry'), and because all of them have gen. pl. in -EJ (KARANDAŞEJ, STOROŢEJ etc.), we will derive all these nouns from {-H} velar stems and revise rule (k:č) as follows:

\[
(k:č) \quad [+\text{obstr}] \rightarrow [+\text{strid}] / \quad \{ \quad [+\text{cons}] \\
\quad \quad [-\text{grave}] \\
\quad \quad \quad \quad [-\text{H}] \}_{\text{NS}}
\]

Examples:

n.s. LOŢ: \((\text{lug}+\text{ox})\)
+\text{fem}
-H

g.s. LŢI: \((\text{lug}+\text{o}x)\)
+\text{fem}
-H

indeclinables SAŞE, ATTAŞE, KLIŞE, TUŞE, which we treat in XIV, and the nouns in -ISČE: KLÄDBISČE (gen. pl. KLÄDBISČO) 'cemetery', DOŢDISČE 'heavy rain', SELIŠČE 'aug. to SELO <<village>>' etc. The nouns in -ISČE are derived from Šsk+i and do not belong here.
2.2 Non-Velar Stems.

These nouns are all formed with the help of the suffix ạ. We have already (pp. 38–40) given some examples of nouns whose roots end in labials; the following are some examples with roots in dentals: NEVEŽA : NEVEŽDA 'ignoramus' (cf. VEDAT 'to know'), MEŽA 'boundary, bound' (cf. MEŽDU : MEŽ 'between' from the same root), PRODAŽA 'sale' (cf. PRODADIM 'we will sell'), KRAŽA 'theft' (cf. KRADU 'I steal'), SVEŽA 'candle' (cf. SVET 'light'), TOLSŽA 'thickness' (cf. TOLSTYJ 'thick'), GUŠŽA 'sediment; thicket' (cf. GUSTOJ 'thick'), PLASŽO 'cloak' (cf. PLAT'E 'clothes'), -ÂČ (as in BOGÂČ, ROGÂČ, BORODÂČ, KRYLÂČ, LOXMAČ, NOSÂČ etc.; cf. -ÂT- in BOGÂTYJ, ROGÂTYJ, BORODÂTYJ, KRYLÂTYJ, LOXMÂTYJ, NOSÂTYJ etc.).

Examination of the genitive plurals of nouns formed with the help of the suffix ạ shows that masc. nouns take ại, fem. nouns ox. Thus, masc.: VOPL' - VOPLEJ 'howl, wail' (cf. VOPIT' 'to howl, wail'), RUBL' - RUBLEJ, BÌČ - BÌŒJ, PLASŽO -
PLASČEJ etc.; fem.: LOVLJA – LOVEL', DUŠA – DUŠ, MEŽA – MEŽ etc. We will account for this fact by requiring that fem. nouns with the suffix -i be redundantly specified \{+H\}, masc. nouns \{-H\}. We note also that \{-H\} fem. nouns have nom. sg. oX (KOST'), instr. sg. Ti+5m (KOST'JU), but that fem. nouns with the suffix -i have nom. sg. o (DUŠA), instr. sg. o1+5m (DUŠOJU), like other \{+H\} fem. nouns (STENA – STENOJU, RUKA – RUKOJU etc.).

3. Diminutives in -OK/-EK.

Examination of the diminutives in -OK/-EK shows that -EK is used after \{-H\} noun stems, -OK after \{+H\} noun stems (we disregard velar stems for the moment, see below): XMELĘK from XMEL’ 'intoxication', PENĘK from PEN’ 'stump', CARĘK from CAR' 'tsar', GUSEK from GUS’ 'goose', ZJATEK from ZJAT’ 'son-in-law' etc., but UZELOK from UZEL 'knot', ČELNOK from ČELN 'dug-out, canoe', ŠNUROK from ŠNUR 'cord', KVASOK from KVAS 'kvass' etc.\(^6\) We derive all these diminutives with the help of the suffix uk:

PENĘK: (((pin)+uk)+ox)

ČELNOK: (((k1ln)+uk)+ox)

---

\(^6\)The one exception known to us is ZVEROK : ZVERĘK from ZVER’ 'wild beast'.
Velar stems shift the velar to the corresponding strident palatal: SNEŽOK from SNEG 'snow', TABAČOK from TABAK 'tobacco', GREŠOK from GREX 'sin' etc. As we have already shown (pp. 146-147), the shift of velar to palatal can be accounted for by assuming that the dim. suffix is įk after velars. An alternate, equally plausible solution is to assume that the dim. suffix is always uk and that (kːč) is expanded to read:

\[
(kːč) \rightarrow (+obstr) \rightarrow (+strid) / \left\{ \begin{array}{c} \text{[-cons]} \\
\text{[-grave]} \\
\hline
\end{array} \right\}_{NS} \rightarrow \text{[H]} + \text{uk} +
\]

We can find no reason for preferring one solution over the other, and, given the solution proposed immediately above, can find no reason for requiring an order in the separate parts of the environment of rule (kːč).

The one exception that we know of is KNJAZĚK (g.s. KNJA- Z'KÁ) from KNJAZ' 'prince'. This form is particularly difficult to explain, not because of the failure to shift velar to strident palatal (the morpheme is marked [−rule (kːč)]), but because of the unexpected shift of velar to ě (whence, ultimately, z) before a diffuse vowel.
APPENDIX. On the Genitive Plural.¹

1. Feminine. The following nouns in -A/-JA take -EJ; these nouns are all marked {-H} and are consequently all regular:

BARŽA - BARŽ and [razg.] BARŽEJ
BAXČA [AO: BAXČEJ]
BRONJA [DR, p. 56: BRONEJ]
BUKLJA - BÜKLEJ
VEKŠA [Šax, p. 129: VEKŠEJ]
VEL'MOŽA [masc.; Šax, p. 129: VEL'MOŽEJ and VEL'MOŻ]
VERŠA [Šax, p. 129: VERŠEJ]
VOŽZA - VOŽZEJ
GOLOVNIJA - GOLOVNĚJ
DEŽA [AO: DEŽEJ]
DOLBSJA [Šax, p. 129: DOLBSNEJ]
DOLJA [Ušakov: DOLĖJ; Šax, p. 129: DOLĖJ and DOL']
DJADJA [masc.] - DJAD'EV and DJADEJ

EPANOČA - EPANOČEJ
ZAPADNJA - ZAPADNEJ
ZARJA [Šax, p. 129: ZARJEJ and ZAR']
KALANČA - KALANČEJ
KARČA - KARČEJ
KVASNJA - KVASNĚJ
KEGLJA - KEGLEJ
KLEŞNJJA - KLEŞNĚJ
KORČA - KORČ and KORČEJ
KUŞČA - KUŠČ and KUŠČEJ
LEVŠA [masc. and fem] - LEVŠEJ
LYŢNJA - LÝŢNĚJ
LJUTNJA - LJUTNEJ

¹All forms taken from Ušakov's dictionary unless a different source is specifically noted. Abbreviations: AO - Russkoe literaturnoe proiznošenie i udarenie, pod. red. Avanesova, Ožegova; Akad - Slovar' sovremennogo russkogo literaturnogo jazyka, Akademija Nauk SSSR, 1948; Šax - Šaxmatov, Očerk sovremennogo russkogo literaturnogo jazyka; DR - V.A. Dobromyslov and D.È. Rozental', Trudnye voprosy grammatiki i pravopisanija (Vypusk vtoroj).
MEŽA [Akad and Šax, p. 129: MĖŻ and [razg.] MEŽĖJ]
MOTNJA - MOTNĖJ and MOTĖN
MREŽA - MREŻ and MREŻEJ
MJAMLJA - MJAMLJEJ
NOZDRJA - NOZDREJ
OGLOBLJA - OGLÔBEL' and OGLÔBLEJ
PARČA [Šax, p. 129: PARČEJ]
PAŠA - PAŠĖJ
PENJA [Šax, p. 129: PENĖJ]
PETLJA [Ušakov: PËTEL'; Šax, PËTEĻJ and PETEL']
PLUTNJA - PLÛTNEJ
PRAŠČA - PRAŠČĖJ
PRIGORŠNJJA [Ušakov: PRÎGOR-ŠEN; AO and DR, p. 56: PRÎGORŠNEJ]
PRITČA [Šax, p. 129: PRITČEJ]
PUTLJA - PÛTEL' and PÛTEĻJ
PJATERNJJA - PJATERNEJ
RAZMAZNJA - RAZMAZNĖJ
RASPRJA - RĂSPREJ
ROXLJA [masc. and fem.] - RÔXLEJ
SVEČA - SVEČ and SVEČEJ
SVODNJA - SVÔDNEJ
SVJATOŠA [masc.; Šax, p. 129: SVJATOŠEJ and SVJATOŠ]
SPLJA - SPLĖJ
STEZJA - STEZĖJ
STUPNJA [AO and DR, p. 56: STUPNEJ]
TETJA - TÊTEJ
TIXONJA - TIXÔNEJ
TLJA - TLĒJ
TOLŠČA [Šax, p. 129: TOLSČEJ]
TONJA [Šax, pp. 129-130: TÔNEJ and TÔN']
TUFLJA [Šax, p. 129: TUFLEJ and TUFEL']
XANŽA [AO and Šax, p. 129: XANŽĖJ]
ČIKLJA - ČÎKLEJ
ČETVERNJA [AO and Šax, p. 129: ČETVERNĖJ]
ČUKČA - ČUKČEJ and [reže] ČUKČ
ČIJUNJA - ČIJUNEJ
ŠESTERNJA - ŠESTERĒN and ŠESTERNĖJ
JUNOŠA [masc.] - JUNOŠEJ
As is well known, nouns with nom. sg. in consonant-NJA (excluding those given immediately above) have gen. plural in consonant-EN: BAŠNJA - BAŠEN, PESNJJA - PESEN, RYBORAZVODNJA - RYBORAZVODEN, XARČEVNJA - XARČEVEN, ČASOVNJA - ČASOVEN, TAMOŽNJA - TAMOŽEN etc. There are very few exceptions: DEREVNJA - DEREVEN', BARYŠNJA - BARYŠEN', SOBARYSNJA - SOBARYSNEN', BOJARYSNJA - BOJARYSEN', KUXNJA - KUXON'. For SOTNJA - SOTEN', BAŠNJA - BAŠEN', VIŠNJA - VIŠEN', KUXNJA - KUXON etc., see Sax, pp. 98, 129.

2. Neuter. Nouns in -0/-E generally show no ending in the gen. plural: SLOVO - SLOV, OKNO - OKON, VEDRO - VEDER, POLOTENEC - POLOTENEC, KLADBIŠČE - KLADBIŠČE etc. The two {-H} nouns MORE 'sea' and POLE 'field', like other {-H} nouns, regularly take -EJ (MOREJ, POLEJ). Some nouns show -OV/-EV: 2

JABLOKO - JABLOK and JABLOKOV
OBLAČKO - OBLAČKOV
UBLAKO - UBLAKOV
OZERKO - OZERKOV
PLEČIKO - PLEČIKOV
OČKO - OČKOV

VERKOV'E - VERKOV'EV
NIZOV'E - NIZOV'EV
KOLESIKO - KOLESIKOV
BRJUSHKO - BRJUSHKOV
LIČIKO - LIČIKOV
BOLOTCE - BOLOTCEV

2As can be seen from the list, many (but by no means all) nouns in -KO have gen. pl. in -OV. All nouns in -KO have nom. pl. in -I: JABLOKO - JABLOKI, KOLESIKO - KOLESIKI etc., etc. The only exceptions are OBLAKO - OBLAKA, OBLAČKO - OBLAČKA, and VOJSKO - VOJSKA.
LOXMOT'EV - LOXMOT'EV
UST'EV - UST'EV
UŠKO - UŠEK and UŠKOV
ŠILO - ŠIL'EV
VAREN'EV [Šax, p. 137: VARE-
SILO - SIL and SIL'EV
N'EV]
RUNO - RUN and RUN'EV
PODMASTER'EV [masc.]-
POMELO - POMEL'EV
PODEMSTRE master'ev
POLENO - POLEN'EV
POLENCE - POLENCE and (prosto-
POLENCEV
reč.) POLENCEV
KOLENO - KOLEN'EV, KOLEN,
and KOLENEJ
KUŠAN'EV [Šax, p. 137: KUŠAN'EV]

3. Masculine. Some nouns with no ending in nom. sg. have no
ending in gen. pl.:
ALTYN [AO: ALTYN (O CENE) and
AMPER - AMPER
ALTYNOV (O MONETE)]
ANGSTREM [DR, p. 57: ANGSTREM]

3According to Šax, p. 137, all masculine nouns with
nominative singular in -o have genitive plural in -ov: DOMI-
ŠKOV, SYNIŠKIV, LJUDIŠKOV etc., although masculine nouns in
-ISCE show no ending: SAPOZIŠČ, KABLUČIŠČ etc.
ANGLIČANIN - ANGLIČAN
ARŠIN [AO: ARŠIN (O MERE) and ARŠINOV (O Mernoj Linejke)]
BAKLĄŽAN - BAKLĄŽAN
BALKAR - BALKAR
BARIN - BAR
BAŠKIR - BAŠKIR and BAŠKIROV
BOILARIN - BOILAR
BUBEN - BUBEN
BURJAT - BURJAT
VATT - VATT
VÔZDUХ - VOZDUX
VÔLOS - VÔLOS (VÔLOS'EVO - prostoreč., obl.)
VÔL'T - VÔL'T
GARDEMARIN [AO: (pri sobir. znač.) GARDEMARIN and (pri oboznačenii otdel'nyx lic)
GARDEMARINOV
GERO [DR, p. 57: GERC]
GLAZ - GLAZ
GLAZÓK - GLAZKOV and GLAZOK
GRAN [AO: GRAN]
DRAGUN - DRAGUN

4 Nouns with the suffix -ANIN/-JANIN have nom. pl. in -ANE/-JANE, gen. pl. in -AN/-JAN, dat. pl. in -ANAM/-JANAM. The only exception is SEMJANIN 'family man': n.p. SEMJANINY. For discussion of the devisive stem suffix -in-, see Roman Jakobson, "The Gender Pattern of Russian," p. 236, and "The Relationship between Genitive and Plural in the Declension of Russian nouns," p. 183, and Šax, pp. 121-123.

5 Isačenko, Die russische Sprache der Gegenwart, I, p. 101: "In den Mundarten sind endungslose Gen. Plur. häufiger (z. B. DĚN zu DĚN' 'Tag'). Sie kommen auch in einigen Zitaten aus dem Kirchenслavischen und in feierlichem Stil vor, vgl. iron. BLAGORASTVORÉNIE VOZDUX 'Gunst der Lüfte' (zu Nom. Sing. VÔZDUХ; das Zitat stammt aus einem Bittgebet), hist. PUT' IZ
GRENADE [AO: (pri sobir. znač.)
GRENADE and (pri oboznačenii otdel'nyx lic) GRENADEOV]
GUSAR [AO: (pri sobir. znač.)
GUSAR and (pri oboznačenii otdel'nyx lic) GUSAROV
ZUBOK - ZUBOK and ZUBKOV
KADET [AO: (pri sobir znač.) KADET and (pri oboznačenii otdel'nyx lic) KADETOV
KIRASIR [AO: (pri sobir znač.) KIRASIR and (pri oboznačenii otdel'nyx lic) KIRASIROV
LEZGIN - LEZGIN
MAD'JAR - MAD'JAR
MIKRON [DR, p. 57: MIKRON]
NOSOK - NOSOK and (razg.) NOSKOV
OM [AO: ÓMOV; DR, p. 57: OM]
PARTIZAN - PARTIZAN and PARTIZANOV
PLEVEL - PLEVEL and PLEVELOV
POGON [AO: POGON; DR, p. 56: POGON and POGONOV
PUD [Šax, p. 115: PUD]
RAZ - RAZ (RAZOV prosto-reč.)
RENTGEN [DR, p. 57: RENTGEN]
ROG - ROGOV and (prosto-reč.) ROG
ROŽOK [AO: RÔŽEK (umen'š.
ot ROG--u životnyx)]
RUMYN - RUMYN
SAPOG - SAPOG [for SAPOGOV, see DR, p. 56]
SAPOŽOK - SAPOZKOV and
SAPOŽEK
SARMAT - SARMAT and
SARMATOV
SOLDAT - SOLDAT
TATARIN - TATAR
TURKMAN - TURKMAN
TUROK - TUROK (TURKOV ustar.)
TJURK - TJURKOV and
TJUROK

VARJÁG V GRÉKI 'der Wasserweg aus Skandinavien (Varängerland) nach Byzanz'. Ebenso in Puschkins >>Prophet<<: >>I GAD MORSKIX PODVÓDNYX XOD<<, wo GAD MORSKIX Genitives pluralis ist und 'Seeungeheuer' bedeutet.
4. The lists given above are not intended to be complete, and we have obviously not attempted to list all deviant gen. pl. forms. We want simply to show by these lists that the number of deviant forms is not quite so small as is generally presumed. The number of forms given here should not, however, detract the reader's attention from the general pattern: no ending in gen. pl. if an ending is present in nom. sg., and vice versa. 6

6Cf. Roman Jakobson, "The Relationship between Genitive and Plural in the Declension of Russian Nouns."
XII. ON THE SPECIFICATION OF THE FEATURE VOICING IN OBSTRENTS.

The final obstruent of a breath group is always voiceless: VOZ [vós] 'cart(load)', but VOZ BREVEN [vózbr,  *****************************************************
'scartload of logs'. Voiceless [f]/[f,], never voiced [v]/
[v,], occurs in final position: LOV [lóv] 'hunting, catching',
but LOV BELUX [lóvbl. Ilúx] 'hunting, catching of white whales'.
If two or more obstruents occur in juxtaposition, voicing is
assimilated regressively: POD STOLOM [petstalóm] 'under the
table', SDELAT' [z, d, élet, ] 'to do (pf.)'. Before final [f]/
f,] obstruents are voiceless: JAZV [jásv] 'ulcer, sore (gen.
pl.)' (cf. nom. sg. JAZVA [jázva]). Before [v]/[v,] no voic-
ing assimilation occurs unless [v]/[v,] is followed by an ob-
struent: TVOJ [tvój] 'your', ZVUK [zvük] 'sound', K VDOVE
[gvdr, é] 'to(ward) the widow', BEZ Vpuska [b, isfpuškə] 'with-
out admittance'.

The following set of ordered rules accounts for these
facts (we discuss examples like ADOLF GITLER [ádl, f, itl, er]
in Chapter XIV):

\[(w:v)_{1} \quad w \to v \quad \{\#\} \quad 0\]  

\[(\text{voice##}) \quad [+\text{obstr}] \to [-\text{voice}] \quad \#\]

(w: v)_2 \( w \rightarrow v \)

In the application of these rules the only relevant boundary markers are those which separate words. These boundary markers must be deleted in certain syntactic positions in order to account for assimilation in phrases like NAŠ BRAT [nàžbrát] 'our brother' etc. In the examples below we assume that the rule which accounts for this deletion has already applied.

NAŠ BRAT: nàžbrát →voice-assim→ nàžbrát

POD STOLOM: pëdstalžm →voice-assim→ pëdstalžm

LOV: lën →(w:v)₁→ lëv →voice#→ lëf

LOV BELUX: lëwb,ïlûx →(w:v)₁→ lëvb,ïlûx

LOV SOBAK: lëvsabâk →(w:v)₁→ lëvsabâk →voice#→ vacuous →voice-assim→ lëfsabâk

JAZV: jàzw →(w:v)₁→ jàzv →voice#→ jàzf →voice-assim→ jàsf
The rules given above are the last rules which we shall consider formally. In order to derive phonetic representation, several other rules must be added to the grammar; the phenomena which these rules must account for have been treated in the literature. Thus, the adjustment of vowels in various environments (close [ɛ] before a sharp consonant, open [ɛ] elsewhere, e.g.; cf. also the fronting of a mentioned in fn. 3, p. 186), the presence/absence of on- and off-glides have been discussed at length by Avanesov, Boyanus, Trofimov and Jones, et al. Rules of akrante for several Russian dialects have been proposed by Morris Halle; these rules fit rather naturally into the framework which we have proposed here. In The Sound Pattern of Russian, Halle gives a number of rules to specify the feature of sharpening for consonants before consonants (nom. sg. ps+ɛ from p,s+ɛ, nom. pl. z,ɛml,+i from z,ɛm,l,+i etc.). Numerous examples and fairly long lists of "permissible" CC, and C,C clusters have been compiled by Avanesov, Boy anus, and Trofimov and Jones.¹

¹The problem with formulating rules to account for sharpening of consonants before consonants is that it is difficult to
determine whether a consonant in this position is fully sharp, partially sharp, or not at all sharp. In those cases where sharpening can be determined (on the basis, say, of the close/open variant of a preceding stressed \( \acute{e} \)), there is frequently wide variation in the speech of even single individuals. Thus Jakobson, "Review of Introduction to Russian by George L. Trager," p. 126, remarks, "The crux of the matter is that softness of consonants before another soft is not opposed to hardness;... it is simply a phonetic anticipation of the following palatalization; and this mechanical anticipation can offer all possible grades of palatalization, all possible degrees of the resonator's compression from the zero stage, i.e., hardness, through various intermediate half-hards or half-soft variants up to complete softness. Instead of a stable norm which the author [Trager] would like to impose upon the students, we observe here various individual vacillations, even more, one and the same person in the same utterance freely varies his pronunciation: \([s,v,i,s,t,\acute{e},-sv,i,s,t,\acute{e},-s,v,i,s,t,\acute{e},-sv,i,s,t,\acute{e},]\) and a whole gamut of intermediary grades."
XIII. INVENTORY OF RULES AND THE RELATIVE ORDER OF THEIR APPLICATION.

In this chapter we will give the inventory of the rules suggested in earlier chapters and shall examine the ordering restrictions that must be placed on these rules.

1. First, however, we shall re-examine six of these rules in the light of the entire phonological component.

1.1 Rule (V:∅).

We have proposed three rules which treat vowel-vowel sequences: (V:∅), (VV:V)_R, and (VV:V)_S. Rule (VV:V)_R must apply before (C:C,) (cf. the derivations of BREG, ČREVO, MLEKO, ŠLEM on pages 93 and 95). Rule (VV:V)_S must apply after rule (C:C,) in order for consonants before the diphthong eu to be specified sharp (3 sg. KLIJUET from ((kleu+5+e)+tu), for example). Hence (VV:V)_R and (VV:V)_S must be kept distinct, and (VV:V)_R must apply before (VV:V)_S. Because of the treatment we have proposed for 1 sg. and 3 pl. forms, however, there is no longer any need to keep rules (V:∅) and (VV:V)_S distinct. We can simply drop (V:∅) from the inventory. We consider a few examples.

Verbs derived from closed stems will never undergo application of rule (VV:V)_S: 1 sg. PEKU from ((pek+e)+m), 3 sg. PEČET from ((pek+e)+tu), 3 pl. PEKUT from ((pek+e)+n+tu) etc.

Verbs derived from stems in 5—will never undergo application of rule (VV:V)_S: 3 sg. PIŠET from ((pIs+5+e)+tu).
Note that the verb suffix $\bar{o}$ will always shift to $\bar{j}$ in these forms on application of rule $(\bar{V}:j)$.

The only forms left are those verb forms derived from stems in $\bar{i}$ or $\bar{e}$. In 1 sg. forms, the suffix shifts to $\bar{j}$ on application of $(\bar{V}:j)$ and rule $(VV:\bar{V})_S$ consequently never applies: $\bar{XO\ddot{U}}$ from $((xod+\bar{I}+\bar{I})+m)$, $\bar{SIZU}$ from $((s\ddot{I}d+\bar{e}+\bar{I})+m)$, $KRI-\bar{CU}$ from $((kr\bar{i}k+\bar{e}+\bar{I})+m)$ etc. In the remaining pres. tense forms rule $(VV:\bar{V})_S$ drops the suffixal vowel after the application of $(C:C,)$:

3 sg. SIDIT: $((s\ddot{I}d+\bar{e}+\bar{I})+tu)$

FIRST CYCLE: $(s\ddot{I}d+\bar{e}+\bar{I}) \rightarrow (C:C, \rightarrow (s,\ddot{I}d,+\bar{e}+\bar{I})$

SECOND CYCLE: $(s,\ddot{I}d,+\bar{e}+\bar{I}+tu) \rightarrow (VV:\bar{V})_S \rightarrow (s,\ddot{I}d,+\bar{I}+tu)$

$\rightarrow u:\emptyset \rightarrow (s,\ddot{I}d,+\bar{I}+t)$

As can be seen from this derivation, rule $(VV:\bar{V})_S$ is restricted to application within the domain of a word. In section 1.2 below we will motivate this restriction.

1.2 Rule $(C:C,)$.

Examination of forms like n.s. LJUBOV' (g.s. LJUBVI) 'love' shows that the second part of rule $(C:C,)$ as formulated on page 184 must be changed. The noun stem in these forms is $NS(leub+uu)_{NS}$, and the final suffixal segment will not undergo application of $(u:w)$ until the second cycle. Hence the part of $(C:C,)$ which sharpens the final consonants of noun stems must
be revised to read:

\[(C:C,) \ C_1 \rightarrow [+\text{sharp}] / \left[\frac{-H}{-H}\right] + X]_N\]

where \(C_1\) represents one or more non-vowels, and \(X\) represents any string not containing #.

Thus the derivations of LJUBOV' and LJUBVI are as follows:

**LJUBOV':** \(((\text{leub}+uu)+ox)\)

  \[-H\]

  **FIRST CYCLE:** \((\text{leub}+uu) \rightarrow (C:C,)[\text{once}] \rightarrow (l,\text{eub}+uu) \quad [\text{no further rules apply; note that application of } (VV:\overline{V})+S \text{ would incorrectly derive } *(l,\overline{\text{Ub}}+\overline{u})] \)

  **SECOND CYCLE:** \((l,\text{eub}+uu+ox) \quad -u:w \rightarrow (l,\text{eub}+uw+ox) \quad -H\)

  \(-C:C, \rightarrow (l,\text{eub}+uw,+ox) \quad -\ddot{o}:\ddot{u} \rightarrow (l,\text{eub}+uw,+ux)\)

  \(-C:\emptyset \rightarrow (l,\text{eub}+uw,+u) \quad -\text{Vredund} \rightarrow (l,\varepsilon \text{Ub}+Uw,+U)\)

  \(-(VV: \overline{V})+S \rightarrow (l,\overline{\text{Ub}}+\overline{Uw},+U) \quad -u:o \rightarrow (l,\overline{\text{Ub}}+\overline{ow},+U)\)

  \(-u:\emptyset \rightarrow (l,\overline{\text{Ub}}+\overline{ow},) \quad -(w:v) \rightarrow (l,\overline{\text{Ub}}+\overline{ov},)\)

  \(-\text{voice}## \rightarrow (l,\overline{\text{Ub}}+\overline{of},)\)

**LJUBVI:** \(((l,\text{eub}+uu)+\ddot{o}x)\)

  \[-H\]

  **FIRST CYCLE:** as above

  **SECOND CYCLE:** \((l,\text{eub}+uu+\ddot{o}x) \quad -u:w \rightarrow (l,\text{eub}+uw+\ddot{o}x) \quad -H\)

  \(-C:C, \rightarrow (l,\text{eub}+uw,+\ddot{o}x) \quad -\ddot{o}:\ddot{u} \rightarrow (l,\text{eub}+uw,+\ddu)\)
1.3 Rule \((\text{u}:w-\text{exc})\)

On pages 121-123 we motivated the inclusion of rule \((\text{u}:w-\text{exc})\) on the basis of the fact that the first segment of the clusters \(ii\) and \(uu\) never appear in phonetic representation as glides: \(\text{STAT'JA/STATEJ} \text{ from } ((\text{stōt}+\text{ii})+\text{ī})/((\text{stōt}+\text{ii})+\text{ōx})\) and \(\text{LJUBOV'}/\text{LJUBVI} \text{ from } ((\text{leub}+\text{uu})+\text{ōx})/((\text{leub}+\text{uu})+\text{ōx})\). On page 134, however, we showed that a diffuse vowel before \(\text{īV}\) is specified [-T]. Hence the example \(\text{STAT'JA/STATEJ}\) is not relevant in discussing \((\text{u}:w-\text{exc})\); the forms are derived with the help of the suffix \(\text{īi}\), not \(ii\) (see the derivation of \(\text{STAT'JA}\) given on page 134). But we still require the restriction for the cluster \(uu\). Forms like \(\text{PLYT' } (3 \text{ sg. PLYVET}) \text{ 'to swim'}\), from \((\text{plūu}+\text{ī})\) and \((\text{plūu}+\text{ē})+\text{tu}\), respectively, show that \(ū\) before \(w\) is not specified [-T]; \(\text{LJUBOV'}/\text{LJUBVI}, \text{ therefore, must be derived with the help of the suffix } uu\) (and not \(*\text{ūu}\) ). The derivations given on pages 206-207 cannot be changed in this respect.

1.4 Rule \((\text{C}:s)\).

On page 84 we formulated rule \((\text{C}:s)\) so that any consonantal segment before morpheme boundary followed by \(i\) was
specified \(+\text{obstruent}\). We derived \(s\) in inf. KLJAST' by mark-
\(-\text{grave}\)
\(-\text{compact}\)
\(-\text{continuant}\)
the root \(\text{klin} [-\text{rule} (S:\emptyset)]\) in the inf. (cf. past KLJAL from
((\text{klin}+l)+\text{ox}); see the derivations on pages 58, 84). Rule \((C:s)\)
was restricted to application after \((S:\emptyset)\) and before \((\emptyset:s)\). Ex-
amination of the possible \text{obstruent-obstruent} clusters in under-
lying forms reveals that the first obstruent in such a cluster
may only be \{\(s, z\)\}: \text{STARYJ} 'old', \text{OTPUSK} 'leave, furlough', \text{SPORYJ}
'profitable', \text{MOZG} 'brain', \text{GNEZDO} 'nest', \text{IZBA} 'hut' etc. It is
possible, therefore, that in the most highly valued grammar rule
\((C:s)\) will account for the constraints placed on the first ob-
struent of an \text{obstruent-obstruent} cluster, as well as accounting
for the shift of dentals and labials to \(s/z\) before infinitival \(t\).
In this case, rule \((C:s)\) must be restricted to apply only to ob-
struents (i.e., not to consonants in general), and inf. KLJAST'
derived in some even more \text{ad hoc} manner.

1.5 Rules \((\text{Vredund-c})\) and \((y:i)\).

These two rules apply late in the grammar. Both apply
after the rules of \text{akan'e}. Rule \((y:i)\) is of wider application
than we have thus far suggested.\(^1\) Thus, for example, SYN I DOČ'

\(^1\)This rule, first given in 1912 by Baudouin de Courtenay,
in \text{Ob otnošeni rubber pis'ma k russkomu jazyku}, \#44, has en-
joyed much popularity with present-day phonemicists.
'son and daughter' may be pronounced either [synydɔ], or [syn ɪ dɔ], depending on whether the word boundary in "son and daughter" is deleted before (colloquial style) or after (oratorical style) the application of (y:i). The rules of akan'e raise and deflat unstressed o a e after palatalized consonants. Thus from zob'a 'wife' (from gen+o), the rules of akan'e shift the pretonic vowel to y and rule (y:i) applies vacuously; from zas+y 'hours' (from kes+ɔx), however, the rules of akan'e shift the pretonic vowel to ɔ and rule (y:i) then fronts y to give [ɔ, isɔ].

2. The Inventory of Rules.

We give below the rules of Russian phonology which we have suggested. Rules (C:s) and (y:i) (cf. 207-208 and 208-209, respectively), the vowel redundancy rules of page 31, and the rules which deal with insertion of segments (rules (o-epenth), (###1###), (φ:j), (φ:j/w), (jo:o), and (φ:I)) are not included in the inventory.

We use the abbreviation C for any \{ [+cons] \} segment, L for any \{ [+voc] [+cons] \} segment, N for any \{ +nasal \} segment, V for any \{ [+voc] [+cons] \} segment, and X for any string not containing ##.

\[(d1:1) \begin{array}{c|c|c|c} \begin{array}{c} +obstr \\ \hline -grave \\ \hline -cont \end{array} & \emptyset & / & +[y] \end{array} \text{past stem}

where [y] represents a single phonological segment.
(EL:EL)

\[
\begin{array}{c}
+\text{voc} \\
-\text{cons} \\
-T \\
+R \\
\end{array}
\rightarrow
\begin{array}{c}
+\text{voc} \\
-\text{cons} \\
-T \\
\langle-R\rangle \\
\end{array}
\]

(V:VV)

\[
\{\leftrightarrow\}
\begin{array}{c}
+\text{voc} \\
-\text{cons} \\
-T \\
\underline{\langle-R\rangle} \\
\end{array}
\rightarrow
\begin{array}{c}
1 \\
2 \\
3 \\
\end{array}
\]

(VV:V)_R

\[
\begin{array}{c}
+\text{voc} \\
-\text{cons} \\
-R \\
\end{array}
\rightarrow
\begin{array}{c}
+\text{voc} \\
-\text{cons} \\
-R \\
\end{array}
\rightarrow
\begin{array}{c}
1 \\
\end{array}
\]

(VL:LV)

\[
\begin{array}{c}
+\text{vocal} \\
-\text{cons} \\
-T \\
-df \\
\end{array}
\rightarrow
\begin{array}{c}
2 \\
3 \\
\end{array}
\]

(\overline{V})

\[
\begin{array}{c}
+\text{voc} \\
-\text{cons} \\
+dif \\
+T \\
\end{array}
\rightarrow
\begin{array}{c}
-T \\
\end{array}
\]

\[
\begin{array}{c}
\langle-R\rangle \\
\end{array}
\rightarrow
\begin{array}{c}
+\text{voc} \langle+T\rangle \\
\underline{\langle-R\rangle} \\
\end{array}
\rightarrow
\begin{array}{c}
+\text{comp} \langle+\text{voc}\rangle \\
\underline{+\text{comp}} \langle+\text{voc}\rangle \\
\end{array}
\rightarrow
\begin{array}{c}
X \\
\# \\
\end{array}
\]
\( (K : \mathcal{K}) : \)

\[
\begin{align*}
\text{(B&c)} & \quad \left\{ \frac{1}{n} \right\} \quad \left[ \frac{r}{-} \right] \quad \mathcal{O} \\
\left[ +\text{obs} \right] & \quad \rightarrow \quad \left[ -\text{grv} \right] \\
\left[ +\text{cmp} \right] & \quad / \\
\left( k : \mathcal{K} \right) & \quad \left( \mathcal{W} \right) \quad \left[ -\text{cons} \right] \quad X \\
\end{align*}
\]

\( (C : C,) \quad \mathcal{O} \quad \rightarrow \quad [+\text{sharp}] \\
\left[ -\text{grv} \right] \\
\left[ -H \right] \quad +X \quad \text{Noun}
\]

\( (\mathcal{O} : \mathcal{U}) \quad \mathcal{O} \quad \rightarrow \quad [+\text{diffuse}] \\
\left[ (+\text{cons}) \right] \#\# 
\]

\( (Vb: V) +S \quad V \quad V \quad X \#\# \quad \rightarrow \quad [2] \quad 3 \\
1 \quad 2 \quad 3 
\]

\( (C : \emptyset) \quad [+\text{cons}] \quad \rightarrow \quad \emptyset \\
\left[ (+\text{cons}) \right] \#\# 
\]

\( (V \mathcal{N}) \quad [+\text{vocal}] \quad \rightarrow \quad \left[ \text{flat} \right] \quad \left[ \text{diff} \right] \quad \left[ +\text{grave} \right] \quad \left[ +T \right] \\
\left[ (+\text{cons}) \right] \quad \left[ (+\text{cons}) \right] \quad \left[ (+\text{cons}) \right] \quad \left[ (+\text{cons}) \right] \\
\left( S : \emptyset \right) \quad [-\text{obstr}] \quad \rightarrow \quad \emptyset \\
\left[ (-\text{vocal}) \right] \quad C \quad X \#\#
\[(\mathfrak{f}:\mathfrak{f})\] \[[+\text{obstr}] \rightarrow [+\text{contin}]\]

\[(\mathfrak{f}:\mathfrak{c})\] \[[+\text{obstr}] \rightarrow [+\text{strid}]\]

\[(\mathfrak{e}:\mathfrak{s})\] \[[+\text{obstr}] \rightarrow [+\text{strident}]\]

\[(\mathfrak{s}:\mathfrak{f})\] \[[+\text{obstr}] \rightarrow [+\text{comp}] / \quad [+\text{obstr}]\]

\[(\mathfrak{s},\mathfrak{f})\] \[[+\text{obstr}] \rightarrow [-\text{\langle\text{sharp}\text{\rangle}}] / \quad [-\langle\text{voice}\rangle]\]

(Cf. p. 178)

\[(\mathfrak{r},\mathfrak{r})\] \[[\text{\langle\text{sharp}\text{\rangle}}] \rightarrow [-\text{\langle\text{sharp}\text{\rangle}}] / \quad [+\text{cons}]\]

\[(\text{e:o-exc})\] \[[\text{Y}] \rightarrow [-\text{\langle\text{next rule}\text{\rangle}}] / \quad [+\text{sharp}]\]

\[(\text{e:o})\] \[[\text{e}] \rightarrow \text{o}\]

\[+\text{R}\]
3. The Order of Application of the Rules.

For each rule, the chart below, modeled on the chart given in Chomsky's *Morphophonemics of Modern Hebrew* (p. 40), shows at a glance which rule it must precede and which it must follow. Note that in the chart we do not give (exc) rules (cf. pp. 122-123); with this exception, the chart contains all the rules given in section 2 above.
<table>
<thead>
<tr>
<th>$(\bar{V}:j)$</th>
<th>$(\kappa:\kappa)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$(u:w)$</td>
<td>$(\bar{k}:\bar{k})$</td>
</tr>
<tr>
<td>$(x: \check{k})$</td>
<td>$(\check{\kappa}:\check{\kappa})$</td>
</tr>
<tr>
<td>$(A)$</td>
<td>$(\alpha: \check{\beta})$</td>
</tr>
<tr>
<td>$(\bar{A})$</td>
<td>$(\beta: \check{\alpha})$</td>
</tr>
<tr>
<td>$(S^+(i:\Lambda))$</td>
<td>$(\mu: \phi)$</td>
</tr>
<tr>
<td>$(\mu)$</td>
<td>$(\gamma: \phi)$</td>
</tr>
<tr>
<td>$(\Pi)$</td>
<td>$(\eta: \phi)$</td>
</tr>
<tr>
<td>$(\mu &amp; \Pi)$</td>
<td>$(\eta: \phi)$</td>
</tr>
</tbody>
</table>
3.1 Before justifying the ordering restrictions of the chart, we discuss the ordering of subsections of rules designated by a single mnemonic.

3.1.1 Rule (u:w).

The order must be as shown on page 210 (cf. pp. 122-123).

3.1.2 Rule (k:ᵋ).

No ordering restriction hold on the two (three) parts of this rule.

3.1.3 Rule (LD).

The order must be (EL:OL), (V:VV), (VV:V)\_R, (VL:LV).

If (V:VV) precedes (EL:OL), we derive

MOLOKO: (((melk+ᵋ))

FIRST CYCLE: (melk) \rightarrow V:VV \rightarrow (meelk) \rightarrow EL:OL \rightarrow

+R \rightarrow V:VV \rightarrow +R

(meelk) \rightarrow VL:LV \rightarrow (melok) \rightarrow \text{etc. (ultimately,}

+R \rightarrow +R

*[m:ilakᵋ] for [melakᵋ])

If (VV:V)\_R precedes (V:VV), we derive

GRAD: (((gord)+ox))

FIRST CYCLE: (gord) \rightarrow (VV:V)\_R \rightarrow \text{inapplicable} \rightarrow V:VV \rightarrow

-R \rightarrow V:VV \rightarrow -R

(goord) \rightarrow VL:LV \rightarrow (gorod) \rightarrow \text{etc. (ultimately,}

-R \rightarrow -R

*[g:ᵋría] for [grːₐ]))

If (VL:LV) precedes (VV:V)\_R, we derive:
GRAD: ((gord)+ox)

FIRST CYCLE: (gord) \rightarrow v:VV \rightarrow (goord) \rightarrow VL:LV \rightarrow -R

(gorod) \rightarrow (VV:V) \rightarrow \text{inapplicable etc. (ultimately, *[gəret] for [ɡət]})

3.1.4 Rule (V).

No ordering relation holds for the three parts of this rule.

3.1.5 Rule (K:K).

No ordering relation holds for the two parts of this rule; note that the environment restrictions of (BdC) and (k:K) are mutually exclusive.

3.1.6 Rule (C:C,).

No ordering relation holds for the two parts of this rule.

3.1.7 Rule (J).

The two parts of this rule must be ordered as shown on page 213.

3.1.8 Rule (U/I).

The order must be (u:š), (u:o), (u:ž).

If (u:o) precedes (u:š), we derive:

DEVČONKA: (((děu)+1k)+ín+uk)+š

FIRST CYCLE: (děu) \rightarrow u:w \rightarrow (děw) \rightarrow C:C, \rightarrow (d,ěw)

SECOND CYCLE: (d,ěw+k) \rightarrow C:C, \rightarrow (d,ěw,+1k)
THIRD CYCLE: \((d, \bar{e}w,+1k+i\nu+uk) \rightarrow k: \bar{c} \rightarrow (d, \bar{e}w,+1\bar{c}+i\nu+uk)\)  
\(-\bar{c}:0,\rightarrow (d, \bar{e}w,+1\bar{c},+i\nu+uk) \rightarrow u:0 \rightarrow (d, \bar{e}w,+e\bar{c},+\nu+uk)\)  
\textit{etc.} (ultimately, *[d,iv,i\bar{c},\bar{c}nk\bar{e}] for [d,if,\bar{c},\bar{c}nk\bar{e}])

If \((u:0)\) precedes \((u:o)\), we derive:

\textbf{PES: }\((pis)+\bar{u})\)

\textbf{FIRST CYCLE: }\((pis) \rightarrow c:c, \rightarrow (p,is)\)

\textbf{SECOND CYCLE: }\((p,is+\bar{u}) \rightarrow u:0 \rightarrow (p,s)\) \textit{etc.} (ultimately, *[ps] for [p,\bar{s}])

3.1.9 Rule \((o:e)\).

No ordering relation holds on the two separate parts of this rule.

3.2 We justify the ordering restrictions shown in the chart on pp. 216-217.

3.2.1 \((kt:k)\) before \((k:\bar{c})\); otherwise

\textbf{MO\bar{c}': }\((m\bar{g}+t\bar{t}) \rightarrow k: \bar{c} \rightarrow \text{inapplicable} \rightarrow kt:k \rightarrow (m\bar{g}+\bar{t})\)  
\textit{etc.} (ultimately, *[m\bar{g},] for [m\bar{c},])

3.2.2 \((\bar{v}:j)\) before \((u:w)\); otherwise

\textbf{KUJET: }\((kou+\bar{e}+e) + tu)\)

\textbf{FIRST CYCLE: }\((kou+\bar{e}+e) \rightarrow u:w \rightarrow (kow+\bar{e}+e) \rightarrow v:j \rightarrow (kow+j+e)\) \textit{etc.} (ultimately, *[kavl,\bar{t}] for [kuj\bar{t}])

3.2.3 \((u:w)\) before \((t:\bar{f})\); otherwise

\textbf{ME\bar{A}: }\((m\bar{e}d+1)+\bar{e})\)

\textbf{FIRST CYCLE: }\((m\bar{e}d+1) \rightarrow c:c, \rightarrow (m,\bar{e}d,+1)\)
SECOND CYCLE: \((m, \dd, +i + \dd) \rightarrow t : \dd \rightarrow \text{inapplicable} \rightarrow u : w \rightarrow (m, \dd, +j + \dd) \text{ etc. (ultimately, } *[m, \dd, \dd] \text{ for } [m, i \dd \dd])

3.2.4 \((t : \dd) \text{ before } (k : \dd) \text{; otherwise}

MEZĀ: \(((m\dd + 1) + \dd)\)

FIRST CYCLE: \text{ as above in sect. 3.2.3}

SECOND CYCLE: \((m, \dd, +i + \dd) \rightarrow u: w \rightarrow (m, \dd, +j + \dd) \rightarrow k : \dd \rightarrow \text{inapplicable} \rightarrow t : \dd \rightarrow (m, \dd, +j + \dd) \text{ etc. (ultimately, } *[m, i \dd, \dd] \text{ for } [m, i \dd \dd])

3.2.5 \((k : \dd) \text{ before } (\dd : \dd) \text{; otherwise}

KRIČAT': \((k\dd k + \dd + \dd) \rightarrow \dd : \dd \rightarrow \text{inapplicable} \rightarrow k : \dd \rightarrow (k\dd \dd + \dd + \dd) \text{ etc. (ultimately, } *[k, i \dd, \dd, \dd] \text{ for } [k, i \dd, \dd, \dd])

3.2.6 \((k : \dd) \text{ before } (o1 : \dd) \text{; otherwise}

CEN: \(((koin) + o)\)

FIRST CYCLE: \((koin) \rightarrow o1 : \dd \rightarrow (k\dd n) \rightarrow k : \dd \rightarrow (c\dd n) \text{ etc. (ultimately, } *[\dd, \dd \dd] \text{ for } [c\dd n])

3.2.7 \((k : \dd) \text{ before } (LD) \text{; otherwise}

ZOLOB: \(((gelb) + o)\)

FIRST CYCLE: \((gelb) \rightarrow EL: OL \rightarrow \text{gold} \rightarrow V: VV \rightarrow (goolb) \rightarrow VL: LV \rightarrow \text{gold} \rightarrow k : \dd \rightarrow \text{inapplicable} \text{ etc. (ultimately, } *[\dd \dd \dd] \text{ for } [\dd \dd \dd])

3.2.8 \((k : \dd) \text{ before } (\dd) \text{; otherwise}

XITRO: \(((x\dd tr) + o)\)

FIRST CYCLE: \((x\dd tr) \rightarrow \dd : I \rightarrow (x\dd tir)

SECOND CYCLE: \((x\dd tir + o) \rightarrow \dd \rightarrow (x\dd tir + o) \rightarrow k : \dd \rightarrow \)
(čitir-o) etc. (ultimately, *[č,itrə] for [x,itrə]; note that with the correct ordering, rule (ů:ů) must be restricted to application within the domain of a word)

3.2.9 (ě:ů) before (k:ů); otherwise
CEN: ((koin)+ox)
FIRST CYCLE: (koin) →oi:ě→ (kěn) →k:ů→ (kěn)
→ě:ů→ (kěn) etc. (ultimately, *[ćan] for [ćen])

3.2.10 (oi:ě) before (k:ů); otherwise
CELIT': (koli+1+tī) →k:ů→ inapplicable →oi:ě→ (kěl+1+tī) etc. (ultimately, *[k,el, it,] for [cěl, it,])

3.2.11 (oi:ě) before (c:c,); otherwise
STOLE: ((stol)+oi)
FIRST CYCLE: (stol) [no rules apply]
SECOND CYCLE: (stol+oi) →c:c,→ inapplicable →oi:ě→ (stol+ě) etc. (ultimately, *[stalę] for [stal,ę])

3.2.12 (LD) before (c:c,); otherwise
BEROŚ': (berg+tī) →kt:k→ (berg+tī) →k:ć→ (berć+1)
→c:c,→ (b,erć+1) →v:vv→ (b,erć+1) →vl:lv→ (b,erć+1) etc. (ultimately, *[b,iręč,] for [b,ir,ęč,])

3.2.13 (V) before (c:c,); otherwise
XITRIT': (xūtr+i+tī) →c:c,→ (xūt,r+i+t,i) →V→ (xit,r+i+t,i) etc. (ultimately, *[xyt,r,ıt,] for [x,it,r,ıt,])
3.2.14 (K:K) before (O:U); otherwise

LIO: \(((lõk)+ox)\)

\[-R\]

FIRST CYCLE: \((lõk) \rightarrow C:C \rightarrow (lõk)\)

SECOND CYCLE: \((lõk+ox) \rightarrow õ:U \rightarrow (lõk+ux) \rightarrow Bdc\rightarrow inapplicable etc. (ultimately, \([l, ūk] for [l, ĕc]\))

3.2.15 (C:C,) before (VN); otherwise

MJAT': (mīn+tī) \(\rightarrow \#\# : i \# \rightarrow (mīn+ti) \rightarrow VN \rightarrow (mōn+ti)\)

\(-C:C,[once] \rightarrow (mōn,+t,i) \text{ etc.} (ultimately, \([m, ĕt,]\) for \([m, ĕt,])\)

3.2.16 (C:C,) before (VV:V)\(+S\); otherwise

LJUBIT': (leub+ũ+tī) \(\rightarrow \#\# : i \# \rightarrow (leub+ũ+ti) \rightarrow (VV:V)\rightarrow S\)

\((lũb+ũ+ti) \rightarrow C:C \rightarrow (lũb+ũ+t,i) \text{ etc.} (ultimately, \([lub, ūt,] for [lub, ūt,])\)

3.2.17 (O:U) before (C:Ø); otherwise

LIO: \(((lõk)+ox)\)

\[-R\]

FIRST CYCLE: as above in sect. 3.2.14

SECOND CYCLE: \((lõk+ox) \rightarrow Bdc \rightarrow (lõk+ox) \rightarrow C:Ø \rightarrow (lõk+ox) \rightarrow õ:U \rightarrow inapplicable etc. (ultimately, \([l, ūk] for [l, ĕc])\)

3.2.18 (VN) before (S:Ø); otherwise

MJAT': (mīn+tī) \(\rightarrow \#\# : i \# \rightarrow (mīn+ti) \rightarrow C:C \rightarrow (m, in,+t,i)\)

\(-S:Ø \rightarrow (m, ū+t,i) \rightarrow VN \rightarrow inapplicable etc. (ultimately, \([m, ūt,] for [m, ūt,])\)
3.2.19 \((\text{VV}:\overline{V}) + S\) before \((U:\overline{I})\); otherwise
\(\text{LJUBIT}': (\text{leub}+\overline{t}I) \rightarrow (\text{leub}+\overline{t}1) \rightarrow (\text{leub}+\overline{t}1) \rightarrow (\text{leub}+\overline{t}1) \rightarrow (\text{leub}+\overline{t}1) \rightarrow \ldots \) etc. (ultimately, *\([l,ib,\overline{t}1]\) for \([l,ub,\overline{t}1]\))

3.2.20 \((S:\emptyset)\) before \((C:\emptyset)\); otherwise
\(\text{LEZÀ} (\text{cf. p. 179}): ((\text{leg}+\overline{e}+\overline{I})+\text{NC})\)
\(\text{FIRST CYCLE}: (\text{leg}+\overline{e}+\overline{I}) \rightarrow (\text{leg}+\overline{e}+\overline{I}) \rightarrow (\text{leg}+\overline{e}+\overline{I}) \rightarrow (\text{leg}+\overline{e}+\overline{I}) \rightarrow (\text{leg}+\overline{e}+\overline{I}) \rightarrow \ldots \) etc.
\(\text{SECOND CYCLE}: (\text{leg}+\overline{e}+\overline{I}+\text{NC}) \rightarrow (\text{leg}+\overline{e}+\overline{I}+\text{NC}) \rightarrow (\text{leg}+\overline{e}+\overline{I}+\text{NC}) \rightarrow (\text{leg}+\overline{e}+\overline{I}+\text{NC}) \rightarrow (\text{leg}+\overline{e}+\overline{I}+\text{NC}) \rightarrow \ldots \) etc.
(ultimately, *\([l,\text{izà}N]\) for \([l,\text{izà}]\))

3.2.21 \((S:\emptyset)\) before \((J)\); otherwise
\(\text{ZEMLA}: ((\text{zem}+1)+\overline{o})\)
\(\text{FIRST CYCLE}: (\text{zem}+1) \rightarrow (\text{zem}+1) \rightarrow (\text{zem}+1) \rightarrow \ldots \) etc.
\(\text{SECOND CYCLE}: (\text{zem}+1+\overline{o}) \rightarrow (\text{zem}+1+\overline{o}) \rightarrow (\text{zem}+1+\overline{o}) \rightarrow \ldots \) etc.
(ultimately, *\([z,11,\emptyset]\) for \([z,11,\emptyset]\))

3.2.22 \((C:\emptyset)\) before \((U:\overline{I})\); otherwise
\(\text{DOMOM}: ((\text{dom}+\text{om})+\text{mu})\)
\(\text{FIRST CYCLE}: (\text{dom}) \rightarrow (\text{dom}) \rightarrow (\text{dom}) \rightarrow \ldots \) etc.
\(\text{SECOND CYCLE}: (\text{dom}+\text{om}+\text{mu}) \rightarrow (\text{dom}+\text{om}+\text{mu}) \rightarrow (\text{dom}+\text{om}+\text{mu}) \rightarrow \ldots \) etc.
(ultimately, *\([\text{dom}\text{m}]\) for \([\text{dom}\text{m}]\))

3.2.23 \((J)\) before \((U:\overline{I})\); otherwise
\(\text{PJET}: ((\text{pI}+\overline{t})+\text{tu})\)
FIRST CYCLE: (p̝i+ə) → u:w→ (p̝i+j+ə) → ū:u→ (pi+j+ə) → C:C,→ (pi,j+ə) → e:o→ (pi,j+ə)
SECOND CYCLE: (pi,j+ə+tu) → u:ґ→ (pi,j+ə+t) → j:l→ (pi,l+ə+t) etc. (ultimately, *[pl,ʒt] for [p,jʃt])

3.2.24 (U̝lI) before (l:ø); otherwise
MOG: ((mog+1)+ox)
FIRST CYCLE: (mog+1) [no rules apply]
SECOND CYCLE: (mog+1+ox) → ū:ū→ (mog+1+ux) → C:ø→ (mog+1+u) → l:ø→ inapplicable → u:ø→ (mog+1) etc. (ultimately, *[mɔgl] for [mɔk])

3.2.25 (U̝lI) before (w:v)₁; otherwise
DEVKA: (((d̝u)+uk)+ο)
FIRST CYCLE: (d̝u) → u:w→ (d̝w) → C:C,→ (d,ɔw)
SECOND CYCLE: (d,ɔw+uk) [no rules apply]
THIRD CYCLE: (d,ɔw+uk+ο) → (w:v)₁→ inapplicable → u:ø→ (d,ɔw+k+ο) → voice-assim→ inapplicable → (w:v)₂→ (d,ɔv+k+ο) etc. (ultimately, *[d,ɛvke]
for [d,ɛfkə])

3.2.26 (U̝lI) before (s:š); otherwise
S ŽENA: (su#((gen)+ο))
FIRST CYCLE: (gen) → k:ɛ→ (j̝en) → C:C,→ (j̝,en)
→ e:o→ (j̝,on)
SECOND CYCLE: (j̝,on+ο) [no rules apply]
THIRD CYCLE: (su#j̝,on+ο) → s:š→ inapplicable → u:ø→ (s#j̝,on+ο) etc. (ultimately, *[zžnə] for [žžnə])
3.2.27 (U)I before (r,:r); otherwise
TVERDO: ((tuird)+0)
FIRST CYCLE: (tuird) → u:w→ (twird) → V:Vv→
(twiird) → VL:LV→ (twirid) → C:C,→ (t,w,ir,id)
→ u:o→ (t,w,er,id)
SECOND CYCLE: (t,w,er,id+0) → r,:r→ inapplicable
→ u:o→ (t,w,er,d+o) → e:o→ exc→ (t,w,er,d+o)
→ e:o→ inapplicable etc. (ultimately, *[tv,ɛrdə] or *[tv,ɛrdɛ] for [tv,ɛrdə])

3.2.28 (l:ʊ) before (voice##); otherwise
MÖG: ((mog+1)+ox)
FIRST CYCLE: (mog+1) [no rules apply]
SECOND CYCLE: (mog+1+ox) → (ʊ:ʊ) and (C:ʊ)→ (mog+1+u)
→ u:o→ (mog+1) → voice##→ inapplicable → l:ʊ→ (mog) etc. (ultimately, *[mʊg] for [mʊ:k])

3.2.29 (w:v₁) before (voice##); otherwise
DEV: ((dėu)+ox)
FIRST CYCLE: (dėu) → u:w→ (dėw) → C:C,→ (d,ėw)
SECOND CYCLE: (d,ėw+ox) → (ʊ:ʊ) and (C:ʊ)→ (d,ėw+u)
→ u:ʊ→ (d,ėw) → voice##→ inapplicable → (w:v₁)→ (d,ėv) etc. (ultimately, *[d,ėv] for [d,ėf])

3.2.30 (voice##) before (voice-assim); otherwise
MOΖG: ((moζg)+ox)
FIRST CYCLE: (moζg) [no rules apply]
SECOND CYCLE: (moζg+ox) → (ʊ:ʊ), (C:ʊ), (u:ʊ)→ (moζg)
-voice-assim→ vacuous -voice##→ (mozk) etc.
(ultimately, *[môzk] for [môsk])

3.2.31 (voice##) before (ʒːz); otherwise

MOČ': (môg+ti) →kt:k→ (môg+i) →kːc→ (môʃ+i)
→iːi→ (môʃ+i) →cːc→ (môʃ+i) →uː∅→ (môʃ,)
→ʒːz→ (môʃ,) →voice##→ (môʃ,) →sːś→ (môʃ)
e tc. (ultimately, *[môʃ] for [môʃ])

3.2.32 (voice-assim) before (wːv)₂; otherwise

TVORIT': (tuor+ıtI) →uːw→ (twor+ıtI) →iːi→
(twor+ı+tI) →cːc→ (twor,+ı+t,ı) →uː∅→
(twor,+ı+t,) →(wːv)₁ → inapplicable →(wːv)₂→
(tvor,+ı+t,) →voice-assim→ (dvor,+ı+t,) etc. (ultim-
ately, *[dvar,ıt,ı] for [tvar,ıt,ı])

3.2.33 (ʒːz) before (kːc); otherwise

KNJAZ': ((kunying)+ox)

- H

FIRST CYCLE: (kunying) →cːc→ (kun,ing)

SECOND CYCLE: (kun,ing+ox) →bdc→ (kun,ing+ox) →cːc→

(kun,ingg+,ox) →(vn), (∅ːū), (cː∅), and (sː∅)→
(kun,∅g+,u) →uː∅→ (kn,∅g, ) →kːc→ (kn,∅ʒ,)
→ʒːz→ inapplicable etc. (ultimately, *[kn,∅c] for
[kn,∅s,]; note that in the correct derivation, rules
(VN) and (Sː∅) must be restricted to apply only within
the domain of a word)
3.2.34 (έ:c) before (θ:s); otherwise

KNJAZ': ((kuning)+ox)

FIRST CYCLE: as above in sect. 3.2.33

SECOND CYCLE: (kun,ing+ox) →(BdC), (0:C,), (VN), (0:ū),
(0:∅), (S:∅), (u:∅), (voice#)#→ (kn,śk,)
(kn,śc,) →έ:c→ inapplicable etc. (ultimately, *[kn,śc] for [kn,śs])

3.2.35 (έ:c) before (έ:έ); otherwise

OTEC (cf. p. 179): ((ot+ik)+ox)

FIRST CYCLE: (ot+ik) →C:C,→ (ot,+ik)

SECOND CYCLE: (ot,+ik+ox) →(BdC), (ś:ū), (C:∅)→
(ot,+ik+u) →u:o→ (ot,+ek+u) →u:∅→ (ot,+ek)

έ:έ→ inapplicable →έ:c→ (ot,+ec) →e:o→
(ot,+oc) etc. (ultimately, *[at,śc] for [at,śc])

3.2.36 (r,:r) before (e:o); otherwise

TVERDO: ((tuird)+o)

FIRST CYCLE: as above in sect. 3.2.27

SECOND CYCLE: (t,w,er,ld+o) →u:∅→ (t,w,er,d+o)
→e:o→ec→ (t,w,er,d+o) →e:o→ inapplicable

→r,:r→ (t,w,erd+o) etc. (ultimately, *[tv,śrdẽ] for [tv,śrdẽ])

3.2.37 (έ:έ) before (e:o); otherwise

LEŻA (cf. pp. 179, 224): ((lėg+ś+I)+NC)

FIRST CYCLE: as above in sect. 3.2.20
SECOND CYCLE: \((l, \varepsilon^2, +\varepsilon + \text{NC}) \rightarrow \forall \rightarrow (l, \varepsilon^2, +\varepsilon + \text{NC})\)
\(\rightarrow (\text{WV}: \tilde{\text{W}})_{\rightarrow S}^{\rightarrow} (l, \varepsilon^2, +\varepsilon + \text{NC}) \rightarrow \emptyset: \emptyset \rightarrow (l, \varepsilon^2, +\varepsilon + \text{C})\)
\(\rightarrow \varepsilon: \varepsilon \rightarrow (l, \varepsilon^2, +\varepsilon) \rightarrow \varepsilon: \varepsilon \rightarrow (l, \varepsilon^2, +\varepsilon) \rightarrow \text{inapplicable} \rightarrow \varepsilon: \varepsilon \rightarrow (l, \varepsilon^2, +\varepsilon) \rightarrow \text{etc.} \) (ultimately, *[l, \varepsilon^2] for [l, \varepsilon^2])

3.2.38 \((e: e) \text{ before } (o: e); \text{ otherwise}\)

PITIJE (cf. p. 165): \(((\text{p} \text{i} + t + \text{i} 1) + \sigma)\)
\(-\text{R}\)

FIRST CYCLE: \((\text{p} \text{i} + t + \text{i} 1) \rightarrow u:w[\text{twice}] \rightarrow (\text{p} \text{i} j + t + \text{i} j)\)
\(-\text{R}\)
\(\rightarrow \tilde{\text{u}}: u: \text{inapplicable} \rightarrow \text{C}: \text{C} \rightarrow (\text{p} \text{i} j + t + \text{i} j)\)

SECOND CYCLE: \((\text{p} \text{i} j + t, + \text{i} j + \sigma) \rightarrow \emptyset: \emptyset \rightarrow (\text{p} \text{i} j + t, + \text{i} j + \sigma)\)
\(-\text{R}\)
\(\rightarrow \varepsilon: \varepsilon \rightarrow (\text{p} \text{i} j + t, + \text{i} j + \sigma) \rightarrow \text{etc.} \) (ultimately, *[p, i t, i j σ] for [p, i t, i j σ])

3.2.39 \((e: o) \text{ before } (c: c); \text{ otherwise}\)

OTEC (cf. pp. 179, 228): \(((\text{o} t + \text{i} k) + \text{o} x)\)

FIRST CYCLE: as above in sect. 3.2.35

SECOND CYCLE: \((\text{o} t + \text{i} k + \text{o} x) \rightarrow (\text{Bdc}), (\tilde{\text{o}}: \text{u}), (\text{C}: \emptyset), (u: o),\)
\(\text{and } (u: \emptyset) \rightarrow (\text{o} t, \varepsilon \text{K}) \rightarrow \varepsilon: \varepsilon \rightarrow (\text{o} t, + \text{ec}) \rightarrow \varepsilon: \varepsilon \rightarrow (\text{o} t, + \text{ec}) \rightarrow \text{etc.} \) (ultimately, *[a t, \varepsilon c] for [a t, \varepsilon c])
XIV. THE \{\pm S\} MARKER.

All lexical roots must be associated with the marker \{\pm S\}. With one exception, which we discuss below, forms marked \{-S\} appear to undergo almost none of the rules we have thus far suggested. Thus, for example, the velars in KEL'T 'Celt', GENIJ 'genius', XERES 'sherry' fail to undergo either \((k:\varepsilon)\) or \((k:\xi)\). In IMPORT 'import', INDEKS 'index', OMNIBUS 'omnibus', ENDSPIEL 'end-game [chess]' etc., the first segment fails to undergo \((VN)\), and the second segment fails to undergo \((S:\emptyset)\). Forms like TEATR 'theater', CIKL 'cycle' etc. (cf. p. 143 fn.) fail to undergo \((\emptyset:I)\). MU\`EDZIN 'muezzin', POET 'poet', G\`OL 'Aeolus', FIALKA 'violet' show phonetic Vowel-Vowel sequences and have thus failed to undergo \((VV:\overline{V})_{+S}\).

The phonology of \{-S\} morphemes presents many problems, and we shall not discuss this phonology in any detail. A superficial examination of these forms suggests, however, that the phonology of \{-S\} forms is strikingly different from the phonology of \{+S\} forms. In \{+S\} forms, for example, the palatals \(\varepsilon \overline{\varepsilon} \varepsilon\) are always derived from underlying velars or dentals; in \{-S\} forms, on the other hand, the palatals\(^1\) seem to be basic to

\(^1\)In \{-S\} forms a fourth palatal, \(\varepsilon\), occurs: DZIN [\(\varepsilon\varepsilon\varepsilon\)] 'gin', DZAZ [\(\varepsilon\varepsilon\varepsilon\)] 'jazz band' etc. In \{+S\} forms the affricate [\(\varepsilon\)] is derived from the cluster \(d+\varepsilon\), as in PODZIAT 'to set on fire', where the segment \(\acute{d}\) before \(\varepsilon\) is imploded and the resulting affricate is derived from a stop+strident constrictive clus-
the phonological system: if [S] velars fail to undergo (k:č) (cf. KEL'T, GENIJ, XERES etc.), then the palatals in ČESTER [č,čestar] 'Cheshire cheese', ŽELE 'jelly', ŽERF 'sheriff' etc. must be present in the underlying representations. Again, sharpening of non-velar consonants does not seem to be predictable in {-S} morphemes, at least not in the straightforward manner that it is in {+S} morphemes: there seems no way to predict that 1 in FLJAGA 'flask' is sharp, but in FLAG 'flag' non-sharp; in AL'FA 'alpha' sharp, but in ALFAVIT 'alphabet' non-sharp.³ Velars, on the other hand, seem to obey the {+S} rule.

ter: [pɛd'yɡat,] = [pe̞d'yɡat,]. The sharped variant [z,] occurs only when  ž  is voiced by application of (vce-assim): DOÔ' BY: dʒ, by  → vce-assim— dʒ, by.

ŽELE is an indeclinable; only {-S} roots may underlie indeclinable nouns: BOA 'boa', KOFÈ [masc.] 'coffee', KLIŠE 'cliché' (cf. p. 189 fn.), ŽJURI (for the sharp ž in [ž,ür,š] see Halle, The Sound Pattern of Russian, p. 73), PARVENJU 'parvenu', PAL'TO 'overcoat', MISSIS 'Mrs.' etc. Ukrainian surnames in -KO (cité-KO) are {+S} forms and are exceptional in that they are not declined, although usage here is apparently not fixed; see Unbegau, Russian Grammar, p. 70.

³Roman Jakobson, 'Review of Fonetika sovremennogo russkogo literaturnogo jazyka by R.I. Avanesov,' p. 288, has observed that "Except /l/-/l'/, hardness and softness are distinguished before a consonant only if the latter is preceded by a /#/ alternating with a vowel: [gór'kɛ]—[gór'ik], [sud'bɛ]—[sud'ɛp], [t'ma]—
(C:C,), for k g x are always sharp before front vowels, non-sharp elsewhere.

Considerations of this nature lead us to formulate (tentatively) the following basic segments for {-S} morphemes:

PAIRED CONSONANTS: t d s z p b f v n m r l [each consonant in two variants, one sharp and one plain]

UNPAIRED CONSONANTS: k g x c (3) ŋ ŋ ŋ ŋ

VOWELS: u i a o e

GLIDE: j

It is of interest to compare the {-S} system with the coexistent {+S} system:

CONSONANTS: t d s z p b k g x m n r l

VOWELS: ū ĺ ĺ ĺ u i o e

Although {-S} segments do not undergo the main body of phonological rules, we must mention one important exception: the final segment of a {-S} morpheme is subject to the application of all rules of the grammar. Thus FLAG : FLAŽNYJ 'flag' [t'omnyj]." The few exceptions like KEN'GI (gen. KEN'G) 'fur galoshes' are clearly marginal.
shows that the final velar in the \{-S\} root flag undergoes (k:ɔ); prep. sg. ÊGÈTE 'egret(-plume)' shows that the final consonant of the \{-S\} root ègret undergoes (C:C,) (note, however, that rule (Ø:j/w), given on page 130, does not insert prothetic j); 1 sg. FRANÇÔ, from FRANTIT 'to show off, play the dany' shows that the final consonant of the \{-S\} root frant undergoes (t:ɛ), (k:ɔ), and (C:C,). The final segments in FIG 'fig', FABRIKA 'factory', AKROSTIX 'acrostic' etc. fail to undergo (BdC) because they are not marked \{-R\}.

Obstruents marked \{-S\} obey the rules for devoicing in final position, and for voicing assimilation in position before an obstruent. Underlying f (i.e., not f < v), however, fails to undergo (vce-assim): ÊF-DUR [ɛfdur] 'F major [music]', e.g. 6

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1Halle, The Sound Pattern of Russian, pp. 73-74.
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WORD INDEX. Below we give page references to all words mentioned in the text, excluding words that occur in the lists on pages 44-48, 66, 70-75, 77-78, 106-110, 112-115, 119-120, 128-129, 135, 143-144, 152-154, 193-199. In the INDEX we refer to the dictionary form of the word; thus 3 sg. pres. PECET is indexed under inf. PECI', nom. pl. PERJA under nom. sg. PERO etc. The abbreviation fn after a page number means that the indexed word occurs in a footnote, parenthesized (fn) that the indexed word occurs both in the text and a footnote. The index is arranged according to the Cyrillic alphabetical order, and the transliteration is as follows:

а А и І р Р ш Ь
б Б й Ј с С ш ЬГ
в В к К т Т Ь "
г Г л L у U ы Y
д D м М ф F Ь .
е Е н N х X з Є
ж Ж о O ц C ь ІU
з Z п Р ч Č ы JA

Beside some entries we give morphological information; unless otherwise stated, any form given will be the gen. sg. for nouns, the 3 pl. for verbs.
A
ABZAC 170fn
AGNEC 130
AD 145fn
ADOL'F GITLER 200
ADSKIJ 145fn
AKROSTIX 233
ALI : AL' 138
ALFAVIT 231
AL'PARI 138
AL'FA 231
APOSTERIORI 138
APRIORI 138
ARMEJSKIJ 134-135
ARMIJA 134(fn), 135
-AT- 190
ATTAŠE 189fn
-ĄČ- 190

B
BEDRO 140
BEZ 200
BEZDEL'NIČAT' 74
BELENA 94fn
BELODREVNYJ 155
BELODREVVEC 155
BELUXA 200-201

BEREG 91, 93
BEREZA 21, 139, 144, 146, 151
BEREZINA 139, 145-146, 159
BEREZNIK 21, 151
BERBČ 97, 137, 164, 222
BIG 42, 190
BIČEVAT' 41-42
BLEVAT' 41
BLEKLYJ 82-83
BLEKNUT' 82
BLESNA 140
BLOXA 170
BLOŠKA 170
BOA (masc. and neut., indecl.) 231fn
BOG 18-19, 163
BOGATYJ 190
BOGAČ 190
BOŽESTVO 119
BOŽIJ 18-19
BOK 11
BOMBA 20
BOMBIT' 20
BORODATYJ 190
BORODAČ 190
BOŠINA 11
BRAT 201
Брат' (Берут) 68, 96, 105
Бревно 140
Брег 91, 93, 204
Брек 155
Брехат' (Брестут) 155
Брит' (Бреют) 133
Бражкат' 168
Бражат' 168, 170
Бы:б 138, 231фн
Бытие 134
Быт' 56, 63-64, 78фн, 85
Быт'е

В
В-/во- 112
Вдова 200, 202
Ведат' 190
Ведро 140
Ведшиц 13, 14фн
Везти (Взут) 13, 14фн, 54фн, 81, 84
Век 18-19, 25, 30
Верба 97, 123-124, 126
Верткий 154
Вертое 154
Веселый 21, 148

Весел'е 21, 148, 150
Весел'няй 152
Весло 140
Весна 91, 140
Вести (Ведут) 14фн, 20, 58фн, 81-84
Ветер (Ветра) 143фн
Ветерок 156
Ветла 140
Ветр 143фн
Ветшат' 72
Веже 188фн
Вешняй 18-19
Вешниж 91
Вз-/Во-/Воз-/Воз-/Возо 114
Вихор (Вихра) 142, 143фн
Виҳр 143фн
Взяц' (Возмут) 67, 80
Виззат' (Виззат) 69
Вино 170
Винго 170
Вкус 20
Вкусныж 20, 29
Власянica 96
Влег' 94
Влег' 94
Внушат'/Внушит' 78фн
VODA 20
VODIT' 13(fn), 14fn, 87
VOZ 13, 200
VOZVRTIT' 90, 99
VOZIT' 14fn, 54fn, 87
VOZOMNIT' 116
VOJTI (VOJDUT) 131
VOLK 18-19, 184
VOLNA 142
VOLČIJ 18-19
VOLOČ' (VOLOKUT) 94, 97
VOLČEC (VOLČCA and VOLČE-CA) 118
VOPIT' (1 sg. VOPLJU, 3 pl. VOPJAT) 190
VOPL' 190
VOROBEJ (VOROB'JA) 133, 134fn
VOROTA (plur. tant.) 99
VOROTIT' 99
VOSKLIKNU'T' 168-169
VOSKLICAT' 168
VOSPRIEMNIK 151fn
VPUSK 200
VRAG 11
VRAŽIJ 11
VRATA (plur. tant.) 99
VREMJA (VREMENI) 44, 49(fn), 50, 96
VSTAT' (VSTANUT) 57fn
VTOROJ 37
VYBIRAT' 15
VYBOR 15
VYBRAT' (VYBERUT) 15
VÝŽDAT' (VÝŽDUT) 25-26
VÝŽIDAT' 25
VÝZVAT' (VÝZOVUT) 15
VÝZOV 15
VÝZYVAT' 15
VYT'E 89
VJAZAT' (VJAŽUT) 56
VJAZNUT' 56
G
GENIJ 230-231
GIBAT' 135
GIBNUT' 11fr, 57fn
GIMN 143fn
GLAS 91
GLOXNUT' 15
GLUXOJ 12, 15
GLUŠ' 12
GNAT' (GONJAT) 68fn
GNEZDO 208
DIKIJ 12
DIKOST' 189
DIČAT' 72
DIČ' 12, 189
DOŽDIŠČE 189fn
DOŽINAT' 23
DOIGIJ 126
DOM 185, 224
DOROŽAT'
DOČ' 171fn, 208, 231fn
DRAT' (DERUT) 68, 105
DRUG (pl. DRUZ'JA) 11,
18-19, 64, 170,
171fn, 180, 181(fn)
DRUŽESKIJI 181fn
DRUŽIT' 11, 18-19, 181fn
DRUŽNYJ 18-19
DRUŽOK 170
DRJABLYJ 82
DRJABNUT' 82
DUB 64
DUMAT' 137
DUŠA 191
DUŠEŠVNYJ 48, 166
DYM 161-162
D'JAVOL'SKI(J) 138

ŽELEZA

E
-EV- 41, 43fn, 44-48
(N)EGO (pron. [n,iva]/
[jiva]) 78fn, 130,
131fn
EDIN- 132
-EL'NYJ 152-154
-EMNIK 151-152
EMU 131fn
ERNIK 152
-(E)SK- 119-120
-(E)STV- 119-120
EST' (1 sg. EM) 59
ETI : ET' (EBUT) 85(fn)
-EC 117-119

Ž
ŽAR 69-70
ŽAT' (ŽUT) 23, 27, 69, 76
ŽAT' (ŽUT) 23, 27, 69, 76
ŽDAT' (ŽDUT) 68, 76, 105
ŽEVAT' (ŽUJUT) 41-42, 64fn,
161-162
ŽEZL 143fn
ŽELE (neut., indecl.) 231fn
ŽELEZA 94fn
Železo 94fn
ŽELKNUT' 16
ŽELOB (pl. ŽELOBA) 96, 221
ŽELTYJ 16, 126
ŽENA 85, 148, 209, 225
ŽENSKIJ 119, 148
ŽIT' (ŽIVUT) 37fn, 121
ŽNEC (ŽNECA) 117
ŽRAT' (ŽRUT) 68, 105
ŽREBIJ 134(fn)
ŽJURI (neut., indecl.) 231fn

Z
ZADIRAT' 25
ZADRAT' 25-26
ZAKANČIVAT' 25
ZAKONČIT' 25
ZAKORUZLYJ 82
ZAMASLIT'/ZAMASLIVAT' 91
ZAMKNUT' 25
ZAMORAŽIVAT' 25, 27
ZAMOROZIT' 25, 27
ZAMYKAT' 25
ZAPIVAT' 15
ZAPIT' (ZAP'JUT) 15
ZAPOJ 15

ZAPOLONIT' 94fn
ZAPRJAČ' 55
ZARJA 76
ZVAT' (ZOVUT) 68, 105
ZVEZDA 144fn
ZVEZDNYJ 144(fn), 146, 159
ZVENET' 50-51, 54
ZVEREK 191fn
ZVEROK 191fn
ZVER' 191fn
ZVON 53-54
ZVUK 53-54, 64, 163, 200
ZVJAKAT' 50-51, 54
ZDES' 138
ZEMELNYJ 40fn, 157-158
158fn
ZEMIJA 21, 83, 140, 148-149, 202, 224
ZEMNOJ 88, 157
ZEMSKIJ 148
ZERNO 125, 140
ZNAT' 76, 121, 137
ZJABLIX 171
ZJATEK 191
ZJAT' (pl. ZJAT'JA, ZJA-
T'EV) 191
| Page 1 |
|-----------------|-----------------|
| I               | KARANDAŠ 188-189|
| I 208           | KARIŠ 9         |
| IGLA 142        | KVAS 191        |
| IGRA 142        | KVASOK 191      |
| IZ-/IS-/IZO- 117| KVĚLYJ 174fn    |
| IZBA 208        | KEDR 174fn      |
| IZDALI 138      | KEL'T 230-231   |
| ILI : IL' 138   | KENGURU (masc., indecl.) 174fn |
| IM 131fn        | KEN'GI (plur. tant.) 232fn |
| IMI 131fn       | KINUT' 11fn     |
| IMPORT 230      | KLADBIŠČE 189fn |
| INDEKS 230      | KLAST' (KLADUT) 81, 84 |
| ISPEC' (ISPEKUT) 11 | KLEV 41, 49fn, 123, 173 |
| ISČEZNOVENIE 66 | KLEVAT' 40-42, 64fn, 204 |
| ISČEZNUT' 66, 81| KLEN 139, 144, 146 |
| ITTI (IDUT) 85, 131 | KLIK 189 |
| (N)IX 78fn, 131 (fn)| KLIČ 189 |
|                | KLIŠE (neut., indecl.) 189fn, 231fn |
| J               | KLOK (pl. KLOČ'JA) 180 |
| -JAT' 26fn      | KLJAST' (KLJANUT) 56fn, 57fn, 58fn, 84, 208 |
| K               | KLJAUZA 161fn   |
| K 200, 202      | KNIGA 137, 162, 171 |
| KAPAT' (KAPAJUT and KAPLJUT) 88 | KNIŽICA 171 |
| KAPLJA 88, 140  |                 |
Knut

Knjazinj 168
Knjažeski 181fn
Knjažit' 181fn
Knjažna 169
Knjažek 192
Knjaž' (pl. Knjaž'ja) 168-
169, 171fn, 180, 181(fn),
183, 190, 192, 227-228

Kožirjat' 75
Kolesiko 171(fn)
Kolesnik 22, 151
Kolesnyj 139, 151
Koleso 22, 139, 171
Koli: Kol' 138fn
Kolot' (Koljut) 96-97
Koljaska 155
Končat' 73
Kop'e 166
Korabel'nyj 40fn, 157-158
Kosa 13, 14fn, 15
Kosec (Kosca) 118
Kostel 152(fn)
Kostel'nyj 152
Kostrec 117-118

Kovat' (Kujut) 36-38,
40, 64, 161, 220

Kost' 183-188
Kot 9
Kofe (masc., indecl.) 231fn
Kraža 190
Krasnoderevec 155
Krasnoderevnj 155
Krasnozamenec 155
Krašt' (Kradut) 190
Kreml' 142
Krepostca 171-172
Krestnjaj 100
Kričat' (Kričat) 69, 76,
205, 221
Krug 82
Kruglyj 82, 142
Krylatyj 190
Krylač 190
Kruk (pl. Krjuč'ja) 180
Kuma 9
Kupce (Kupca) 117, 170
Kurit' 20-21

L

Lad'ja 98
Lgat' (Lgut) 189
Lebed' 183
Lev (L'va) 100
LEGKIJ (pron. [lɛkɛj])
   154
LEGČAT' 72
LEGCE 154
LED (L'ĐA) 102, 150
LEDNIK 150
LEŽAT' (LEŽAT) 76, 179,
   224, 228-229
LEZT' (LEZUT) 81
LEST' (LESTI) 103
LEŠ' (LJAGUT) 50-52, 56,
   78 fn
LI : L' 138
LINJAT' 76
LICO 168-169, 171, 223
LIČIKO 171
LIČNOJ 169
LOV (LOVA) 200-201
LOVIT' 36, 38-39, 88
LOVLJA 38-40, 88, 140,
   184, 191
LODKA 98
LOŽE 188 fn
LOŽ' (LŽI) 189-190
LOMIT' 88-89
LOXMATIJ 190
LOXMAČ 190
LUG 64
LUKA 54 fn
LUG 64
LUKA 54 fn
L'VICA 170
L'GOTA 183
L'STEC (L'STECA) 117-118
L'STIT' 103
LJUBIT' 82, 87, 223-224
LJUBOV' (LJUBVI) 121-122,
   205-207
LJAKA 54 fn
M
MALYS 190
MAXAT' (MAŠUT) 18-19
MĒD (MĒDA) 30
MEŽA 42, 87, 190, 191,
   220-221
MEŽ(DU) 190
MEŽEVAT' 42
MERÈŽA 99
-MERET' (-MRUT) 126
MERZNUT' 15, 123-125
MERTVYJ 125
MERCAT' 170
MESTI (METUT) 81, 84, 142
MESTO 20-21, 25
MEST' (MESTI) 103
METEL'NYJ 157
METEL'SIK 156-157
METLA 140-141, 155
METR 143fn
MEŠOK 102
MEŠOČEK 102-103, 147
MISSIS (fem., indecl.) 231fn
MLEKO 94(fn), 95-96, 204
MLEKOPITAJUSIE 94fn
MLEŠNYJ 94fn
MNOGO 11
MNOŽESTVO 11
MOZG 208, 226-227
MOKNUT' 65
MOLODEC 119, 169-170
MOLOĐINA 169-170
MOLOKO 94(fn), 95-96, 170, 218
MOLČKO 170
MLOT' (MELJUT) 94fn, 97
MONAŠESKIJ 119
MORE 76
MOROZ 15
MOX (MXA or MOKA) 103
MOČ' (MOGUT) 18-19, 76, 82-84, 180, 220, 225-227
MRAK 29
MRAČNYJ 29
MREŽA 99
MSTIT' (1 sg. MSČU) 103
MUDREC (MUDRECA) 117
MUŽ (pl. MUŽ'JA and MUŽI) 145fn
MUŽESKIJ 145fn
MUKA 18-19
MUČIT' 18-19
MUĐEZIN 161fn, 230
MČAT' (MČAT) 68fn
MYT' (MOET) 121, 133
MYT'SJA 170fn
MJATEŽ 55
MJATEŽNIK 151fn
MJAT' (MNUT) 23, 27, 69, 186fn, 223
N
NADĚŽA 100
NADĚŽDA 100
NADZIRAT' 15
NADZOR 15
NAEMNIK 100, 151fn, 152
NAZVAT' (NAZOVUT) 25-27
NAZYVAT' 25, 27
NANJAT' (NAJNUT) 80
NAPERSTOK 100
NAPISAT' (NAPIŠUT) 20
NAPRJAČ' (NAPRJAGUT) 55
NATUGA 54
NACAT' 9, 23-24, 27, 30
NACIŅAT' 23-24, 30
NAŠ 201
NĚBNYJ 144fn
NĚBO (pl. NEBESA) 100
NĚBO (pl. NEBA) 100, 144fn
NEVEŽ(D)A 190
NEGO/NEĚ/NIX 78fn
NEL'GA 183fn
NEL'ZJA 183
NESTI (NESUT) 14fn, 20,
54fn, 76, 81, 136,
139, 144, 146
NIZ-/NIS-/NIZO- 116-117
-NIČAT' 73-74
-NJAT'/-NIMAT' 76-80, 152
-NOVENIE 66-67
NOVOTEL'NYJ 152
NOGA 185
NOSATYJ 190
NOSAČ 190
NOSIT' 14fn, 54fn
-NU- 65-67, 96

O
0
0-/OB-/OBO 116
OBEZVODIT' 26fn
OBEZVOŽIVAT' 26fn
OBLAKO 184
OBLIK 168
OBLYGAT' 25, 111
OBMANUT' 67
OBMINAT' 23
OBNJAT' (OBNIMUT) 79fn
OBOIGAT' (OBOIGUT) 25-26
OBUSLAVLIVAT' 26fn
OBUSLOVIT' 26fn
OBUSLOVLIVAT' 26fn
-OV- 38, 42, 43fn, 44-48
OVEČIJ 104, 140
OVCA 140
OGLOXNUT' 81
OGON' (OGNJA) 142
ODEŽA 57fn, 99
ODEŽDA 57fn, 99
ODIN 132
ODNOPOMETNIK 151-152
ODUTLIJ 82
OZABOTIT' 26fn
OZABOŽIVAT' 26fn
OZLOBIT' 26fn
PERL 143fn
PERO (pl. PER'JA) 21, 149-150
PERST 100
PĚRYŠKO 21, 148
PĚS (PSA) 21-22, 25, 28-30, 49fn, 139-140, 202, 220
PESIJI 21-22, 140, 150
PESIK 139, 144, 159
PESTRYJ 142
PETLJAT' 75
PĚTR 22
PĚTJA 22
PEČ' (PEKUT) 18-19, 21-22, 59-61, 76, 81, 137, 164, 180, 204
PIVO 170
PIVKO 170
PIVCO 170
PISAT' (PIŠUT) 35-36, 40, 82, 87, 204
PITIE 165-166, 229
PIT' (P'JUT) 89, 120, 133, 224-225
PIT'E 133, 166
PLAKAT' (PLAČUT) 18-19, 76, 86, 89, 189
PLATIT' 59-60, 76
PLAT'E 190
PLAČ 189
PLAČEVNYJ 166-167
PLAŠČ 190-191
PLEVAT' (PLJUJUT) 41
PLEN 94fn
PLĚNKA 95fn
PLESTI (PLETUT) 81
PLETKA 22
PLET' (PLETI) 22
PLEČIKO 171
PLEČO (pl. PLĚČI) 171, 188fn
PLYT' (PLYVUT) 121, 207
POGIBNUT' 81
POD 200-201
PODŽIGAT' 230fn-231fn
PODŽINAT' 111
PODLYJ 82
PODNJAT' (PODNIMUT) 79fn
PODOBRAČ' (PODBERUT) 111-112
PODODRAT' (PODDERUT) 105-106
PODOŽDAT' (PODOŽDUT) 105-106
PODPISAT' (-PIŠUT) 66-67
PODSKAŽAT' (-SKAŽUT) 115
POĐERKIVAT' 123fn
POD"EMNIK 151fn
POJNIJ 126-127, 143fn
POL'ZA 183
POMETIT' / POMEČAT' 152
POMETNIK 152
POMINAT' 23
POMINOVENIE 67
POMNIT' 23, 137
POMJANUT' 67
POMINAT' 78-80
PONJAT' (POJMUJ) 76, 78-80
PO-PTIČI 138
POROT' (PORUT) 96
POT (POTA) 28-29
POXITIT' (1 sg. POXISĆU) 90
POXISĆAT' 90
POČTI 138
PRE- 116-117
PREĐ-/PREĐO- 116-117
PREEMNIK 100, 151fn
PRIGOTOVIT' 67
PREEMNIK 151fn
PRIJTI (PRIDUT) 80(fn)
PRIKOŠNOVENIE 67
PRINJAT' (PRIMUT) 80
PRODAZA 190
PRODAT' (1 sg. -DAM) 190
PROKLINAT' 57fn, 58fn
PRONIKAT' 168-169
PRONIKNUT' 168-169
PRONICAT' 168-169
PROREKAT' 168
PROREČ' (PROREKUT) 168
PRORICAT' 168
PROSROČIVAT' 26fn
PROSROČIT' 26fn
PROSTIT' 85, 180
PROČEST' (PROČUT) 21, 150
PROŠČAT' 73
PRUŽINA 55
PRYGNUT' 20, 137, 164
PRJAŽKA 55
PRJAST' (PRJADUT) 81
PTICA 169-170
PTIČIJ 138, 169-170
PUSKAT' 16
PUSTIT' 16
PUT' (irreg. masc.: gen./dat./
prep. sg. PUTI, instr. sg.
PUTEM) 94fn
PUX 11
PUXLYJ 82
PUXNUT’ 82
PUŠISTIJ 11
POELA 154
POEL’NYJ 154
PSENNIIK 152
PYL’CA 170
PJAT’ 186

RA
RA B 145fn
RABSKIJ 145fn
RAVNYJ 98
RADI 138
RÁZ- 98-99
RAZDÍRAT’ 15
RAZDOR 15
RAZŽEC’ (RAZOŽGUT) 111
RAZŽIMAT’ 23
RAZLIT’ (RAZOLJUT) 67
RAZMYSNIT’ (1 sg. RAZ-
   MYSLN) / RAZMYSŁJAT’ 91
RAZNO 98
RAZNJAT’ (RAZNIMUT) 79fn
RAZODRAT’ (RAZDERUT) 15
RAZUM 98

RALO 98-99
RASPINAT’ 23
RASPRJA 98
RASPJAT’ (RASPNUT) 23
RASSMOTRET’ (RASMTJRJAT) 67
RASSPROST’ 115
RASTI (3 pl. RASTUT; masc.
past ROS) 98
RVAT’ (RVUT) 105
REBRO 140, 155
REMBSLO 140
REŠETČATIJ 155
RŽAT’ (RŽUT) 105)
ROVNYJ 98
ROGATYJ 190
ROGAČ 190
RÓZ- 98-99
ROZNO 98
ROSPIS’
ROST 98
ROSČERK 98
ROT (RTA) 28-29, 33-34
   49fn, 102, 111fn
RUBL’ 190
RUKA 9, 10(fn), 11-13, 30
RUČIŠKA 11
RUČIŠČA 11
<p>| Ručka 11 |
| Ručnoj 9, 10(fn), 12-13 |
| Ručonka 11 |
| Rys' 187 |
| S |
| S-/SO- 85, 112, 114-116 225 |
| Sad 186fn |
| Sâse (neut., indecl.) 189fn |
| Svekor (Svekra) 142 |
| Sverlo 142 |
| Svet 190 |
| Sveča 190 |
| Svjaž' 56(fn) |
| Sdelat' 200 |
| Sedlo 140 |
| Selezenj 140 |
| Selezenka 94fn |
| Selezen' (Seleznja) 94fn, 140 |
| Selishće 189fn |
| Selo 22, 148, 189fn |
| Sel'skij 22, 148 |
| Semjanin (pl. Semjaniny) 197 |
| Sestra 22 |
| Sestrin 22 |
| Sest' (Sjadut) 50-51, 56, 78fn |
| Szadi 138 |
| Sidet' (Sidjat) 34-36, 40, 205 |
| Sila 20-21 |
| Sil'nyj 20-21, 29 |
| Skorotel'nyj 154 |
| Skresti (Skrebut) 81 |
| Skudnyj 55 |
| Skudost' 55 |
| Sladkij |
| Slat' (Sljut) 76, 91 |
| Slez 144fn |
| Sleznyj 144fn |
| Slovăr' 76 |
| Slovo 170, 184 |
| Slovoč 170 |
| Slušat' 57fn |
| Slyšat' (Slyšat) 57fn, 69 |
| Smuglyj 142 |
| Smutit' (1 sg. Smušđu) 55 |
| Smuťjan 55 |
| Smjatenie 55 |
| Sneg 192 |</p>
<table>
<thead>
<tr>
<th>Word</th>
<th>Page Numbers</th>
<th>Synonym Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNEŽOK</td>
<td>192</td>
<td></td>
</tr>
<tr>
<td>SNJAT' (SNIMUT)</td>
<td>76, 79(fn), 80</td>
<td></td>
</tr>
<tr>
<td>SOBAKA</td>
<td>201</td>
<td></td>
</tr>
<tr>
<td>SOBARYŠNJJA</td>
<td>195</td>
<td></td>
</tr>
<tr>
<td>SOBLAZN</td>
<td>143fn</td>
<td></td>
</tr>
<tr>
<td>SOBOR</td>
<td>116</td>
<td></td>
</tr>
<tr>
<td>SOVREMENNYJ</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>SOLOVEJ (SOLOV'JA)</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>SOL'</td>
<td>170</td>
<td></td>
</tr>
<tr>
<td>SOL'CA</td>
<td>170</td>
<td></td>
</tr>
<tr>
<td>SOPROSTANOVŠIK</td>
<td>114fn</td>
<td></td>
</tr>
<tr>
<td>SOPROVODIT' (ppp SOPROVOŽĐEN)</td>
<td>116</td>
<td></td>
</tr>
<tr>
<td>SOSAT' (SOSUT)</td>
<td>68fn</td>
<td></td>
</tr>
<tr>
<td>SOKREBYVAT'</td>
<td>116</td>
<td></td>
</tr>
<tr>
<td>SOSTJAZAT'SJA</td>
<td>168, 182</td>
<td></td>
</tr>
<tr>
<td>SOXNUT'</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>SOJUZ</td>
<td>56(fn), 132</td>
<td></td>
</tr>
<tr>
<td>SPAT' (1 sg. SPLJU, 3 pl. SPJAT)</td>
<td>68fn</td>
<td></td>
</tr>
<tr>
<td>SPEX</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>SPEŠIT'</td>
<td>52-53</td>
<td></td>
</tr>
<tr>
<td>SPORYJ</td>
<td>208</td>
<td></td>
</tr>
<tr>
<td>SPRJAGAT'</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>SRAT' (SERUT)</td>
<td>68, 105</td>
<td></td>
</tr>
<tr>
<td>STARYJ</td>
<td>208</td>
<td></td>
</tr>
<tr>
<td>STAT' (STANUT)</td>
<td>56fn, 57fn</td>
<td></td>
</tr>
<tr>
<td>STAT'JA</td>
<td>89, 121-122, 133-134, 207</td>
<td></td>
</tr>
<tr>
<td>STEBLO</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>STEKLO</td>
<td>142</td>
<td></td>
</tr>
<tr>
<td>STEL'NYJ</td>
<td>154</td>
<td></td>
</tr>
<tr>
<td>STENA</td>
<td>184, 187</td>
<td></td>
</tr>
<tr>
<td>STLAT' (STELJUT)</td>
<td>68, 105</td>
<td></td>
</tr>
<tr>
<td>STOL</td>
<td>20-21, 200-201, 222</td>
<td></td>
</tr>
<tr>
<td>STOLBEC (STOLBAC)</td>
<td>119</td>
<td></td>
</tr>
<tr>
<td>STOLKNUT'</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>STONAT' (STONUT and STONAJUT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STOROŽ</td>
<td>188-189</td>
<td></td>
</tr>
<tr>
<td>STOJAT' (STOJAT)</td>
<td>57fn, 69</td>
<td></td>
</tr>
<tr>
<td>STRAXOVAT'</td>
<td>76</td>
<td></td>
</tr>
<tr>
<td>STREMA</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>STREMIT'</td>
<td>139, 150</td>
<td></td>
</tr>
<tr>
<td>STUDENYJ</td>
<td>57fn</td>
<td></td>
</tr>
<tr>
<td>STUDIT' (ppp STUŽEN)</td>
<td>57fn</td>
<td></td>
</tr>
<tr>
<td>STYNUT'</td>
<td>57fn</td>
<td></td>
</tr>
<tr>
<td>STYT' (STYNUT)</td>
<td>56fn, 57fn</td>
<td></td>
</tr>
<tr>
<td>SUK (pl. SUČ'JA)</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>SUPRUG</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>SUXOJ</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>SČET</td>
<td>139</td>
<td></td>
</tr>
<tr>
<td>SČETEC</td>
<td>139, 144</td>
<td></td>
</tr>
<tr>
<td>SYGRAT'</td>
<td>131</td>
<td></td>
</tr>
<tr>
<td>SYN (pl. SYNOV'JA, SYN-OVEJ)</td>
<td>208</td>
<td></td>
</tr>
</tbody>
</table>
T
TABAK 192
TABAČOK 192
TVERDYJ 97, 123-125, 226, 228
TVOJ 37, 200
TVORIT' 227
TEATR 143fn, 230
TENETNIK 152
TEPER' 138
TEPLYJ 140
TERET' (TRUT) 126, 139, 144
TERZAT' 168, 182
TERN 142
TERPET' (TERPJAT) 76, 87
TES (TESA) 25, 28-30
TESLO 140
TETJA 154
TESŽA 154
TIGR 143fn
TIUN : TIVUN 161fn
TIXO 189
TIŠ' 189
TKAT' (3 sg. TKET, 3 pl. TKUT) 105, 180-182
TOLČI' (TOLKUT; past TOŁOK, TOLKIA) 97, 126, 127, 136
TOLSTIJ 190
TOLŠČA 190
TORG 38
TORGOVAT' 39, 161
TORGOSIJA 38-39, 88
TREŠNIK 151
TRUSIT' 55, 64
TRJASTI (TRJASUT) 55
TUGOJ 54
TUŽIT'ŠJA 54
TUŠE (neut., indecl.) 189fn
TJAGAT'ŠJA 168
TJAGOST' 54
TJAJELEYJ 54
TJANUT' 54
U
UBIRAT' 25, 27-28
UBRAT' (UBERUT) 25-28
UGOL (UGLA) 142
UGOL' (UGOLJA) 142
UGOR' (UGRJA) 142
UGOSČAT' 70
UŽELI : UŽEL' 138
UZEL (UZLA) 191
UZELOK 159, 191
UZKIJ 56(fn)
UZY (plur. tant.) 56(fn), 132
UŽIN 132
UM 20
UMBRETTVIĆ/UBERSOVLJAT' 91
UMNIK 171
UMNICA 171
UMNYJ 20, 23, 29
UPOMINOVENIE 67
UPOMJANUT' 67
UPRUGIJ 55
USLADIT' (ppp USLAŽEN) 90
USPEK 18-19
USPESNYJ 18-19
UXO (pl. UŠI) 9-10, 12-13, 78fn, 161fn

F
FABRIKA 233
FAVN 143fn
FIALKA 230
FIG 233
FILOSOF 145fn
FILOSOFSKIJ 145fn
FIRN 143fn
FLAG 231-233

FLAŽNYJ 232-233
FLJAGA 231
FRANČIT' 233

X
XANŽA 171fn
XERES 230-231
XITRIT' 222
XITRYJ 11fn, 135, 221-222
XLESTAT' (XLEŠČUT) 76
XMELEK 191
XMEL' (prep. V XMEL'; loc. VO XMELJÚ) 191
XODIT' 13, 14fn, 205
XOLM 97
XOXOTAT' (XOXOČUT) 87
XREBET (XREBTA) 100
XRIPLYJ 82
XRIPOTA 82

C
CAREVNA 48, 166
CAREK 191
CAR' 191
CVESTI (CVETUT; masc. past CVĚL) 174(fn), 175
<table>
<thead>
<tr>
<th>Šerif</th>
<th>231</th>
<th>Ė</th>
</tr>
</thead>
<tbody>
<tr>
<td>ŠLEM</td>
<td>94fn, 95, 204</td>
<td>ĖGRET 233</td>
</tr>
<tr>
<td>ŠNUR</td>
<td>191</td>
<td>ĖNDŠPIL' 230</td>
</tr>
<tr>
<td>ŠNUROK</td>
<td>191</td>
<td>ĖOL 230</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ĖF-DUR 233</td>
</tr>
<tr>
<td>Šć</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ŠČADIT'</td>
<td>55(fn)</td>
<td>JU</td>
</tr>
<tr>
<td>ŠČEGOLJAT'</td>
<td>75</td>
<td>JUG 132</td>
</tr>
<tr>
<td>ŠČEKA</td>
<td>139, 144fn</td>
<td></td>
</tr>
<tr>
<td>ŠČEBOKA</td>
<td>139, 144, 146-147</td>
<td>JA</td>
</tr>
<tr>
<td>ŠČEONYJ</td>
<td>144fn</td>
<td>JABLOKO 184</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JAGNENOK 130</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JAGODICA 170</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JAZVA 200-202</td>
</tr>
</tbody>
</table>
Bibliography

I was born in New York City in 1934, graduated from Phillips Exeter Academy (Exeter, N.H.) in 1952, from Duke University (Durham, N.C.) in 1958. From Duke I received a B.S. in mathematics, with a minor in chemistry. My interest in linguistics stems from an informal study of Russian, which I began in 1956. Of the linguistic literature which I read before coming to MIT in 1960, Roman Jakobson's "Russian conjugation" (Word, 1948) and Noam Chomsky's Syntactic Structures ('s-Gravenhage, 1957) made the deepest impression on me. The influence of these works can be seen in my thesis. I have published two articles, "О циклических правилах в русском спряжении" and "On the Phonology of Old Church Slavonic Conjugation" (details in BIBLIOGRAPHY).