A PHONOLOGICAL DESCRIPTION OF CONTEMPORARY
LITERARY UKRAINIAN

by

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B.A., University of British Columbia, 1961

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS

in the Department
of
Slavonic Studies

We accept this thesis as conforming to the
required standard

THE UNIVERSITY OF BRITISH COLUMBIA
September, 1962
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The University of British Columbia,
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Date _______ September 14th, 1962 _______
ABSTRACT

The present thesis presents the results of a preliminary investigation of the phonology of contemporary literary Ukrainian (CLU). Based on a morphological analysis of the material contained in H. Holoskevyč, Pravopysnyj slovnyk, it describes the orthoepic standard set forth in O. Synjavs'kyj, Normy ukrajins'koji literaturnoji movy (with due consideration given to the current Soviet norms) within the framework of the theory of phonology formulated by Morris Halle (The Sound Pattern of Russian).

Chapter II contains the descriptive statements under three headings: Segments and Boundaries, Morpheme Structure Rules, and Phonological Rules. The segments are defined in terms of distinctive features as follows:

<table>
<thead>
<tr>
<th>Consonantal</th>
<th>Vocalic</th>
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<tbody>
<tr>
<td>-+-+-+-+-+-+-+-</td>
<td>-+-+-+-+-+-+-+-</td>
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</table>

<table>
<thead>
<tr>
<th>Compact</th>
<th>Flat</th>
<th>Grave</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-------+-----------------------------</td>
<td>0-------+-----------------------------</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Strident</th>
<th>Nasal</th>
<th>Continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>000000000000-+-----------------------------</td>
<td>000000000000-+-----------------------------</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tense</th>
<th>Sharped</th>
<th>Accented</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000000000000-+-----------------------------</td>
<td>0000000000000-+-----------------------------</td>
<td></td>
</tr>
</tbody>
</table>

Chapter III presents a discussion of the individual morphonemes and boundaries. Among the problems discussed are: the morphonemic representation of geminates and of
distinctively sharped labial and palatal consonants: the
distribution of sharped and plain consonants before /i/ in
different varieties of CLU; the distribution of /i/ and /y/
word initially and after /j/; earlier attempts to reduce the
inventory of vowel phonemes to five; the synchronic and dia-
chronic status of the feature tense vs. lax; the status of
the marginal phonemes /f/, /ʃ/, /ʒ/, /ʒ̊/, /ɡ/.

Chapter IV surveys and discusses the material on
which the morpheme structure rules are based and offers a
few incidental comments on problems connected with their
formulation.

Chapter V primarily illustrates the operation of the
phonological rules and discusses their order. A concluding
section contains a brief discussion of the optional phono-
logical rules which describe deviations from Synjavs'kyj's
Normy.
ACKNOWLEDGEMENTS

In the preparation of the present paper I have received assistance from many parts, and I am pleased to acknowledge my debt to them.

I wish to thank the many members of the Ukrainian community of Vancouver who have helped me in various respects. I am particularly grateful to Dr. M. L. Huculak, and to Mr. and Mrs. Ivan Reshetnyk, from whom valuable text material was collected.

I am grateful to the Ukrainian Professional and Business Men's Club of Vancouver for the generous financial assistance I received, and I am especially grateful to the president of this organization, Dr. John Yak, who took a personal interest in my work and helped me in every way.

To the staff members of the University Library who went out of their way to assist me I offer my warmest thanks.

I am most deeply grateful to my teacher, Dr. J. O. St. Clair-Sobell, who introduced me to the field of Slavic linguistics and first awakened my interest in the Ukrainian language.

September 1962

Henning Andersen
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CHAPTER I

INTRODUCTORY REMARKS

The present paper presents some of the results of a preliminary investigation into the phonology of contemporary literary Ukrainian. A full-scale study of contemporary literary Ukrainian was, for practical reasons, impossible within the scope of this investigation, and a number of limitations had to be imposed at various points. These limitations are discussed below (Chapter I-C). First, however, it is necessary to clarify the sense in which the terms "contemporary literary Ukrainian" and "phonological description" are used in the present paper.

A. CONTEMPORARY LITERARY UKRAINIAN

Contemporary literary Ukrainian (hereafter referred to as CLU) is the official language of the Ukrainian Soviet Socialist Republic and the literary language of Ukrainians outside the Soviet Union.

The present description of CLU is essentially based on the orthoepic norms described by Oleksa Synjavs'kyj in his Normy ukrajins'koi literaturnoi movy. These norms are part of the literary standard adhered to by Ukrainians.

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1 Second edition, L'viv, Ukrajins'k£Vydavnyctvo, 1941, pp. 5-37 and 168-176.
outside the Soviet Union,² but have been found irreconcilable with the objectives of Marxist-Leninist educational policies and, consequently, relinquished in the Soviet Ukraine.³

As a result of this, it is necessary to reckon with several varieties of CLU. The differences among these are differences in the distribution of phonemes and are, within the theoretical framework adopted for the present description, reflected in the existence of alternative phonological rules. For the sake of clarity, only the rules describing the orthoepic norms set forth by Synjavs'kyj have been included in Chapter II-C (The Phonological Rules). The alternative rules are given in the course of the discussion of the phonological rules in Chapter V.

B. THEORETICAL BACKGROUND

The present description is an attempt to apply to the

² See, for example, G. Y. Shevelov (pseud. Jurij Serex), Narys sučasnoji ukrajins'koji literaturnoji movy, Munich, Molode Žyttja, 1951, p. 12.

³ The standard description of the current Soviet norms, Kurs sučasnoji ukrajins'koji literaturnoji movy, ed. L. A. Bulaxovs'kyj (Kyjiv, 1955), unfortunately was not available. The Soviet norms are, however, described in such textbooks as M. A. Žovtobrjux, Sučasna ukrajins'ka literaturna mova, Kyjiv, Radjans'ka Škola, 1961; and O. M. Parxomenko, Ukrajins's'ka mova, I, Kyjiv, Radjans'ka Škola, 1961; as well as in recent articles on the subject (cf., for instance, the articles by F. T. Žylko, listed in the bibliography).
data of CLU the theory of phonology formulated by Morris Halle in his *The Sound Pattern of Russian*. This theory of phonology, which has been integrated into the theory of language proposed by Noam Chomsky, is embodied in six formal conditions which phonological descriptions must satisfy. They are summarized in the following.

Condition 1. Speech events are represented as sequences of segments, characterized by phonetic properties, and boundaries, characterized by their effects on the former.

Condition 2. The phonetic properties that characterize segments belong to a restricted set of such properties, the binary distinctive features.

Condition 3. The phonological description provides a method for deriving the utterance symbolized from every phonological representation without recourse to information not contained in the phonological representation.

Condition 4. The phonological description is integrated into the grammar of the language in such a way that it facilitates simple statements of all grammatical operations.

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Condition 5. In phonological representations the number of specified features is consistently reduced to a minimum compatible with satisfying Conditions 3 and 4.

Condition 6. All phonological boundaries correspond to morpheme boundaries.

The theory specifically rejects a condition which has played an important rôle in traditional American linguistics, viz that the phonological description provide instructions for inferring the correct phonological representation of any speech event without recourse to information not contained in the physical signal. This condition is referred to as Condition 3a.6

An exposition of the considerations that make these six conditions necessary, as well as a discussion of their main implications, is given in Sound Pattern (pp. 19-44) and will not be attempted here. Where appropriate in the discussion below (Chapter III to V), the relevance of the conditions for the solutions adopted in the present description will be mentioned, and a few incidental comments

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the latter's "Čto takoe transformacija," Voprosy jazyko-

6 The conditions listed above are introduced in the dis-
cussion in Sound Pattern as follows: 1 and 2, on p. 19;
3 and 3a, on p. 21; 4, on p. 24; 5, on p. 29 f.; 6, on
p. 41.
on some of their implications will be offered.

C. LIMITATIONS

The theoretical framework adopted for the present description requires that the phonological description be based on a full-scale analysis of the language in question. This is necessary, for instance, in order that morpheme structure rules of a sufficient degree of generality can be formulated. It is also necessary in order to satisfy Condition 4. A full-scale study of CLU was clearly excluded by the scope of the present investigation. As a consequence a number of limitations of the present description have to be mentioned.

To make it possible for the phonological description to satisfy Condition 4, a preliminary survey of CLU inflection and derivation was made. The sample analysed was H. Holoskevyč's orthographic dictionary, which, with its some 40,000 entries, constitutes the richest easily accessible source of information on CLU morphology.7

It is on this sample that the morpheme structure rules (Chapter II-B) have been based. It is possible, though not probable, that an expansion of the corpus will necessitate a revision of these rules.

The non-phonemic distribution of prominence in the unaccented syllables of the Ukrainian phonological phrase has, to this writer's knowledge, not been investigated since T. Lehr-Spławinski's study "Z fonetyki małoruskiej" in 1916, based on the speech of eight informants from various parts of eastern Galicia. It is not certain that the results of this study, which are summarized by Jan Zilyński in his chapter on Ukrainian stress, are representative of CLU. A new study of Ukrainian stress, based on the current norms of CLU, is very desirable, but such a study could not be undertaken within the present investigation.

Condition 2 requires that all segments be defined in terms of the distinctive features. Ideally, the feature composition of the CLU morphonemes would be established on the basis of measurements of their acoustic properties. While this could not be done in the present investigation, it is hoped that the definitions proposed in this description will serve as a valuable point of departure for a future acoustic study of the CLU segments.

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8 Opis fonetyczny języka ukraińskiego, Kraków, Gebethner i Wolff, 1932.

D. ORGANIZATION

A phonological description based on Morris Halle's theory of phonology consists of descriptive statements of two sorts: an inventory of the segments and boundaries in terms of which any utterance in the language in question can be represented (Condition 1); and a number of rules by means of which any utterance (conveniently in a phonetic transcription) can be derived from its phonological representation (Condition 3).

In conformity with Condition 5, any feature in a given segment which can be inferred from other features in the same segment, or in other segments in the context, should be left unspecified in the phonological representation and assigned by a rule. In order that this principle can be applied consistently to ensure maximal economy without Condition 4 being violated, it is necessary that the rules be divided into two sets, the morpheme structure rules and the phonological rules. The latter, which describe the sequential constraints that hold for segment sequences in general, are applied after the morphological rules. The former, which describe the automatic distribution of features within individual morphemes, are applied before the morphological rules, i.e. as soon as the lexical morphemes have been selected from the dictionary.
The resulting tripartition of the descriptive statements (A. segments and boundaries; B. morpheme structure rules; C. phonological rules) is reflected in Chapter II of the present description.

The three subdivisions of Chapter II are commented on in Chapters III, IV and V respectively. For the purpose of facilitating unavoidable cross-references, these chapters have been subdivided into sections, to which decimal numbers have been assigned. This system of numbering follows the generally accepted conventions (e.g. Sec. 1.32 follows Sec. 1.3134; Secs. 1.321, 1.322, and 1.323 can be referred to en bloc as Sec. 1.32).

E. GRAPHIC CONVENTIONS

The phonetic transcription used in the present paper is an adaptation of that used by Olaf Broch. It differs from Broch's and/or the alphabet of the International Phonetic Association in the following respects:

The symbols a, e, i, o, u, y have the values described in Chapter III-A, Sec. 2.11. Raising and lowering are denoted by adscript diacritics (thus [y⁻] is a lowered, [y⁺] a raised variety of [y]). Moderate and strong fronting

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10 Slavische Phonetik (Sammlung slavischer Lehr- und Handbücher, herausg. v. A. Leskien u. E. Berneker), Heidelberg, Carl Winter, 1911.
are denoted by a superscript dot and diaeresis respectively (e.g. [á], [ä]). Accented vowels are distinguished from corresponding unaccented vowels by an acute accent.

The dental affricates are denoted by the letters č (tense) and ř (lax). The palatal consonants are symbolized by the letters ď, ȷ, š, ž. Palatalization is indicated by a Polish hook (e.g. ć represents a palatalized lax dental stop). The symbols š and ž represent the lax bilabial and velar continuants respectively.

Phonetic transcription is enclosed in square brackets, phonemic representations (satisfying Conditions 3 and 3a), in slants, and morphonemic representations (not satisfying Condition 3a), in braces. Since it is convenient to distinguish between different stages of the specification of non-phonemic features, segment sequences to which the morpheme structure rules have not been applied are distinguished from segment sequences containing only fully and incompletely specified morphonemes by underlining. Incompletely specified morphonemes are marked with a superscript ring to distinguish them from the corresponding fully specified morphonemes.

The asterisk marks phonological entities (phonemes, morphonemes) with phonetic properties or distributional characteristics differing from those of similar phonological entities in CLU.
CHAPTER II

DESCRIPTIVE STATEMENTS

A. SEGMENTS AND BOUNDARIES

The Segments

The feature composition of the forty-four morphophonemes of CLU is displayed in the branching diagram on the following page (Figure I). The numbers at the different levels of the diagram refer to the following eleven distinctive features:

1. Consonantal vs. non-consonantal.
2. Vocalic vs. non-vocalic.
3. Compact vs. diffuse.
4. Flat vs. natural.
5. Grave vs. acute.
6. Strident vs. mellow.
7. Nasal vs. non-nasal.
8. Continuous vs. interrupted.
9. Tense vs. lax.
10. Sharped vs. plain.
11. Accented vs. unaccented.

The statements of the branching diagram are summarized in the distinctive feature matrix below (Figure II).

The segments will be discussed in detail in Chapter II-A.
The Boundaries

The following five morpheme boundaries are postulated for CLU:

1. A phrase boundary, designated by the symbol \[1\].
2. A word boundary, designated by the symbol \[2\].
3. A prefix boundary, designated by the symbol \[3\].
4. A suffix boundary, designated by the symbol \[4\].
5. A compound boundary, designated by the symbol \[\text{[5]}\]. The effects of these five boundaries are discussed in Chapter II-B.

B. MORPHEME STRUCTURE RULES

The morpheme structure rules are partially ordered. Each rule has been assigned a number and a letter, of which only the number refers to the order in which the rule must be applied. The section numbers correspond to the sections in Chapter IV in which the rules are discussed.

1.0. The following rules assign the proper values to all segments in which the features consonantal vs. non-consonantal and vocalic vs. non-vocalic are unspecified.

1.1. The rules in this section apply to segment-sequences immediately following the & marker.

Rule MS 1a. If the first segment is a glide, the second segment is a vowel.

Rule MS 1b. If the first segment is a liquid, a consonantal second segment is non-vocalic, and a non-consonantal second segment is vocalic.

Rule MS 1c. If the first segment is a liquid, and the second segment is consonantal, the third segment is a vowel.

Rule MS 2. If the first three segments are
consonants, the fourth segment is a vowel.

Rule MS 3. If an initial cluster contains a non-initial glide or liquid, the glide or liquid is followed by a vowel.

Rule MS 4. If the morpheme contains no vowel, or if the vowel which follows the initial cluster is followed by a & marker, rules MS 5 to 11 do not apply.

1.2. The rules in this section apply to segment sequences immediately preceding the & marker.

Rule MS 5a. If the last segment is a glide, a consonantal penultimate segment is non-vocalic, and a non-consonantal penultimate segment is vocalic.

Rule MS 5b. If the last segment is a glide, and the penultimate segment is consonantal, the antepenultimate segment is a vowel.

Rule MS 5c. If the last segment is a liquid, and the penultimate segment is a consonant, a consonantal antepenultimate segment is non-vocalic, and a non-consonantal antepenultimate segment is vocalic.

Rule MS 5d. If the last three segments are consonants, the preceding segment is vocalic.

Rule MS 6. If the last segment is a liquid, and both the penultimate and the antepenultimate segments are consonants, the preceding segment is a vowel.
Rule MS 7. If in a final cluster a segment other than the last is a glide or a liquid, it is preceded by a vowel.

Rule MS 8. If the morpheme contains only one vowel, rules MS 9 to 11 do not apply.

1.3. The rules in this section apply to segment sequences between the first and the last vowel of a morpheme. The rules are applied first to the segment sequence immediately following the first vowel of the morpheme.

Rule MS 9a. If the first segment is a glide, a non-consonantal second segment is vocalic.

Rule MS 9b. If the first segment is a glide, and the second segment is consonantal, the third segment is a vowel.

Rule MS 9c. If the first segment is consonantal, and the second segment is a consonant, the third segment is vocalic.

Rule MS 10. If in a medial cluster a segment other than the first is a glide or a liquid, it is followed by a vowel.

Rule MS 11. If the vowel following the medial cluster is not the last vowel of the morpheme, rules MS 9 to 11 are reapplied.

2.0. The following rules apply to segments in which the values of the features compact vs. diffuse, grave vs.
acute, and continuous vs. interrupted can be inferred from other features in the same morpheme.

Rule MS 12a. If a grave compact consonant is followed by a consonant, the latter is diffuse.

Rule MS 12b. If a glide is preceded by a consonant, the latter is grave and diffuse.

Rule MS 12c. If a glide is followed by a non-flat diffuse vowel, the latter is acute.

Rule MS 12d. In a sequence of liquids, the first is interrupted, and the second is continuous.

The material on which the above rules are based is surveyed and discussed in Chapter IV.

C. THE PHONOLOGICAL RULES

The phonological rules are partially ordered. Each rule has been assigned a number and a letter, of which only the former is significant for the order in which a given rule is to be applied. The section numbers correspond to those of Chapter V, where the rules are discussed and exemplified.

1.1. The following rules hold within a phonological phrase.

Rule P 1. If in a word initial obstruent cluster the
last segment is tense, all obstruents other than \{v\} preceding the tense segment become tense; except that a lax obstruent followed by a prefix boundary may remain lax if it is immediately preceded by a vowel and no pause intervenes.

Rule P 2a. If an obstruent cluster contains a lax segment other than \{v\}, all obstruents in the cluster which precede the lax segment become lax unless a compound boundary intervenes.

1.2. Unless otherwise indicated, the following rules hold within a phonological word only.

Rule P 2b. Non-nasal mellow acute diffuse consonants are interrupted.

Rule P 2c. Before \{j\}, grave compact consonants become acute.

Rule P 3a. Before acute compact consonants, non-nasal mellow and strident acute diffuse consonants become compact.

Rule P 3b. Acute compact consonants are strident.

Rule P 4a. Before strident acute diffuse consonants, acute compact consonants become diffuse.

Rule P 4b. Before strident acute diffuse consonants, mellow non-nasal acute diffuse consonants become strident.

1.3. Rule P 5a. Grave diffuse consonants are sharped before \{?\} and, when preceded by a consonant with no
intervening boundary, before \{j\}; they are plain elsewhere before non-consonantal segments.

Rule P 5b. Acute diffuse consonants and continuous liquids are sharped before \{j\} when no boundary intervenes.

Rule P 5c. Acute compact consonants are sharped before \{i\} and \{j\} and plain elsewhere before non-consonantal segments.

Rule P 5d. \{\breve{r}\} preceded by a consonant is sharped before \{j\}; otherwise it is plain before \{j\}.

Rule P 6. Unless a boundary intervenes, acute consonants and continuous liquids are geminated before a sequence of glide followed by vowel.

Rule P 7. After a sharp consonantal segment, or after any consonantal segment and before a word boundary, \{j\} is eliminated.

Rule P 8a. Grave diffuse consonants are plain when not followed by a non-consonantal segment.

Rule P 8b. Except for mellow and continuous strident acute diffuse consonants followed by a suffix boundary, all acute diffuse consonants are plain before \{\breve{y}\} and \{\breve{e}\}.

Rule P 8c. Except across a prefix boundary, strident acute diffuse consonants are sharped before \{\breve{i}\}.

Rule P 8d. Grave compact consonants are sharped before \{\breve{i}\} and plain elsewhere.

Rule P 8e. Acute compact consonants are plain when
not followed by a non-consonantal segment.

Rule P 8f. \{ǐ\} is sharped before \{ĩ\}, but plain before \{ŷ\} and \{ē\} and when not followed by a non-consonantal segment.

Rule P 8g. Except when part of a gemination immediately preceded by a word or prefix boundary, or when a suffix boundary intervenes, \{ĩ\} is plain before \{ŷ\} and \{ē\}.

Rule P 9a. In clusters of acute diffuse consonants, all segments are sharped if the last segment is sharped, and all segments are plain if the last segment is plain, unless a boundary intervenes.

Rule P 9b. Acute diffuse consonants are plain before \{l\} and \{r\}.

Rule P 9c. When no prefix boundary intervenes, strident acute diffuse consonants are sharped before sharped grave diffuse consonants.

Rule P 9d. Acute diffuse consonants are sharped before \{l\} when no boundary intervenes.

Rule P 9e. \{ĩ\} is sharped before sharped acute diffuse consonants.

1.4. Rule P 9f. When no prefix boundary intervenes, a continuous strident acute consonant becomes interrupted in position after an interrupted strident acute consonant.
Rule P 9g. {j} is acute and sharped.

Rule P 10a. In position after a strident acute diffuse consonant and before {n}, an interrupted acute consonant is eliminated.

Rule P 10b. Geminates are simplified when contiguous to a consonantal segment.

Rule P 10c. When not followed by a vowel, postvocalic {v} becomes non-consonantal.

Rule P 11a. A sequence of identical consonantal segments is articulated with a single onset or closure, and a single terminal transition or release, separated by a prolonged tenure.

1.5. Rule P 11b. Flat vowels are grave.

Rule P 12. In position after a sharped segment, grave vowels tend to become acute.

Rule P 13. In position before a sharped segment, grave vowels have [i]-like off-glides.

Rule P 14. Unaccented grave flat and acute natural compact vowels tend to become diffuse.

2. Rule P 15. In a phonological phrase containing two accented vowels, the first accented vowel is less prominent than the second.

Rule P 16. Unaccented vowels are less prominent than accented vowels.
CHAPTER III

COMMENTS ON THE SEGMENTS AND BOUNDARIES

A. THE SEGMENTS

The following pages offer some comments on the mor-
phonemes of CLU under the following headings: 1. the glide;
2. the vowels; 3.1. the labial, 3.2. the dental, 3.3. the
palatal, and 3.4. the velar consonants; 4. the liquids.
Each of these sections discusses the feature composition of
the segments as proposed in Chapter II-A as well as the
problems of analysis connected with the individual morpho-
nemes. Where the solutions adopted in the present descrip-
tion differ from those of earlier descriptions, the latter
are reviewed. The concluding Section 5 contains a few
remarks on the degree of economy achieved in the branching
diagram in Chapter II (Fig. I).

The Glide

The distinctive features consonantal vs. non-conson-
antal and vocalic vs. non-vocalic define four classes of
segments in CLU, glides, vowels, consonants, and liquids.
This is in conformity with the definitions in Fundamentals
of Language and with Morris Halle's treatment of Russian.¹

¹ Roman Jakobson and Morris Halle, Fundamentals of Lan-
guage (Vol. I of Janua Linguarum, ed. C. H. van Schooneveld),
Apparently the definitions of vowels, consonants, and liquids are well founded. But glides seem problematic.\(^2\)

In his review of the definitions of the distinctive features which are proposed in *Fundamentals*, Fant discusses the difficulties raised by glides in general, and by sounds like those of Russian \{j\} in particular. Specifically, he suggests the possibility of defining the latter as non-vocalic and consonantal (if its friction be considered distinctive), or as vocalic and consonantal (if the friction be considered unimportant). On the whole, it would seem, sounds like those of Russian \{j\} are not optimally described as non-vocalic and non-consonantal, a description that best fits pure glides of the [h]-type. Fant does concede, however, that "a weak non-fricative [j] connected smoothly to a following vowel may be labeled a glide."\(^3\)

It is on the basis of this statement that the decision to define CLU \{j\} as non-consonantal and non-vocalic was made. For where \{j\} is represented by [j], it


\(^3\) Fant, p. 216.
answers Fant's description of a [j]-glide very well.4

Ziłyński describes it in part as follows:

. . . Tylko w emfazie w pozycji akcentowanej, osobliwie przed ɨ, otrzymuje ɨ w języku ukraińskim charakterystyczny dla spółgłosek frykatywnych szmer, zbliżający je do dźwięcznego spirantu ɨ, jednakowoż odcień ten ɨ różni się bardzo znacznie od właściwego ɨ niemieckiego słabszym szmerem. . . .5

1.2. With one exception, all the descriptions of CLU known to this writer recognize [j] as constituting a phoneme, /j/ of the language. The one dissenter is Karol Dejna, who in his "Fonologiczny system języka ukraińskiego" states that "wariantem fonemu ɨ jest ɨ."6 Dejna does not elaborate this statement, but presumably he means that [i] and [j] do not contrast and, consequently, can be considered representations of one and the same phoneme.7

This is not true, however. [i] and [j] do contrast, and, where they do, their order cannot be inferred from the phonetic context. This is clearly shown by pairs of words

4 It may be noted here that {j} is not uniquely realized as [j]. Cf. Sec. 1.3.

5 Jan Ziłyński, Opis fonetyczny języka ukraińskiego (Polska Akademia Umiejętności, Prace Komisji Językowej, Nr 19), Kraków, Gebethner i Wolff, 1932.

6 Biuletyn Polskiego Towarzystwa Językoznawstwa, X (1950), p. 151. Dejna's phoneme */ɨ/ will be discussed again below, Sec. 2.32.

like [oʃiː˨ɗa] 'I shall do without' and [objiːdajʊsa] 'I am
gorging myself', or [bezzúpiːj] 'toothless' (dat.sg.fem.) and
[bezzúbjiː] 'toothlessness' (loc.sg.). Dejna's phonemic
solution would render the two last mentioned words
*/bezzubii/ and */bezzubii/\(^8\). Since it fails to account for
the phonetic facts, it must be rejected.

1.3. It was mentioned above (Sec. 1.1, n. 5) that
\{j\} is not uniquely realized as [j]. Two distinct problems
are involved, the matter of long, or geminate, consonants,
and the question of distinctive sharpening of generally only
non-distinctively sharpened consonants. Although the former
problem involves more than the multiple realizations of \{j\},
this seems the most convenient place to survey both questions
in full.

1.31. The long, or geminate, consonants\(^9\) have been
treated in widely divergent ways by different writers. It
may be of some interest to compare the different treatments
by Ziłyński, Dejna, and George Y. Shevelov.

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\(^8\) The absence of accentuation in these examples is in
accordance with Dejna's failure to confer phonemic status on
the CLU stress. Cf. his remarks on p. 151. In the article,
stress is marked only in the phonetic transcriptions.

\(^9\) The CLU geminates are described variously as long,
lengthened, and geminate (both phonetically and phonemically).
The terminological confusion has not been relieved by Trou-
betzkoy's term "corrélation de gémination" for the feature
1.3111. Zilnyński, who treats geminates in his chapter on quantity, calls them "długie (wzdłużone)", but points out that in intervocalic position geminates are articulated with diminuendo-crescendo intensity and, consequently, give the impression of identical consonants separated by a syllable boundary. He does not give an exhaustive account of gemination in the chapter on quantity, but geminates are commented on passim all through the book. From the table of consonants, where "dźwięki niesamoistne" (i.e. positional variants) are included in brackets, it is apparent that Zilnyński does not consider geminates separate phonemes.

1.3112. Dejna's very tersely formulated statement on geminates can be quoted in full.

3. stopień przewyższenia: Korelacja podwojenia:
Na skutek tego, że w dawnych połączeniach l', n', t', d', s', z', š', ž', ž' + 'j po zaniku ' zidentyfikowało się 'j z poprzednią zmienioną spółgłoską, a połączenia l'l', t't' . . . znalazły się w obrębie jednego morfemu, mamy w języku ukr. korelację podwojenia. Fonemy l', n', t', d', s', z', ċ, š, ž, o wyraźnym początku i końcu pozostają do niepodwojonych l', n', t', d', s', z', ċ, š, ž, gdzie nastąpiło fonologiczne złączenie się początku i końca, w opozycji

10 Thus these consonants are properly speaking geminates from a phonetic point of view. Cf. J. Marouzeau, Lexique de la terminologie linguistique, 3-e éd., Paris, Geuthner, 1951.

11 Zilnyński, p. 158 f., p. 6, and passim.
Dejna adds that in the Volhynian dialects, where the third person marker \( \{t\} \) has fused with the initial of the reflexive enclitic \( \{\text{ga}\} \), a geminate \("c\"") \( \ldots \) z możliwego staje się fonemem realnym \( \ldots \). \(^{13}\)

\[^{13}\text{Shevelov, who mentions Dejna's article in his bibliography, does not share Dejna's views. He rejects the term "podvojennja" (gemination) as referring properly only to the orthographic rendering of these consonants and holds that articulatorily there is only "podovžennja" (lengthening). After stating that } t', d', s', z', c', l', n', b, v, m, d, z, ź, n, s, i \text{ can occur lengthened, and that the normally plain ź, ź, ź can be sharpened and lengthened, Shevelov surveys the contexts in which geminates are found. He defines five distinct contexts: A. At the juncture between prefix and radical, between radical (or base) and suffix or desinence, between word and enclitic, or between words. B. In stem final position in neuter nouns.}\]

\[^{12}\text{Op. cit., p. 151.}\]

\[^{13}\text{Op. cit., p. 152. It is unclear why such a phoneme should be limited to the Volhynian dialects. The phenomenon is wide-spread in the eastern part of the Ukraine. Cf. the texts numbered 1, 2, 3, 4, 6, 7 (East Polesian); 8 (Central Polesian); 37, 38, 39 (Middle Dnieper); 41, 43, 44 (Sloboda); 45, 47, 48 (Steppe); in F. T. Żylko, Narysy z dialektoholiți ukrajins'koji movy, Kyjiv, Radjans'ka Skola, 1955. Cf. also Zilyński, p. 89.}\]

\[^{14}\text{George Y. Shevelov (pseud. Jurij Serex), Narys sučas-}\]
in -ja, and in some masculine and feminine nouns in -ja.

C. Before the in.sg. desinence -ju of feminine nouns of the third declension. D. Before the reflexive enclitic {§a}, where the person markers {š} '2nd pers. sg.' and {ť} '3rd pers.' have been assimilated. E. In the adjectival suffixes -enn(yj) and -ann(yj).15 Shevelov considers the geminates separate phonemes, but he is quick to point out that

... vaha podovžennja pryholosnyx u sučasnij literaturnij movi ne velka, bo vono maje zvyčajno til'ky morfolohičnu rol'ju, buvšy zv'jazane z rozmežuvannjam morfolohičnyx častyn slova abo z pevnymy morfolohičnymy katehoriyamy.

Only in a few unclassifiable instances does gemination "characterize the radical of a word," as seen in examples like panna, ssaty, 11ju - 1lješ, where "... podovžennja ... ne tvoryt' jakojis' systemy, a zberihajet'sja čysto tradycijno ... ."16

1.312. In the following pages, Dejna's and Shevelov's phonemicizations will be confronted with the material they describe, and at the same time it will be shown how the

15 These categories will be referred to repeatedly in the discussion below, Sec. 1.313.

16 Shevelov, Narys, pp. 379-81.
morphismemes of the present description, which includes no distinctive feature of "consonant length" or "gemination", are related to the geminate consonants of CLU. First, however, a few remarks of a general nature seem to be in order.

In his chapter on gemination, Troubetzkoy makes the following introductory remarks, which are quite pertinent to the problem in CLU

. . . Or, il y a dans beaucoup de langues des consonnes dites géminées. Elles se distinguent des consonnes non géminées par leur durée plus longue et la plupart du temps aussi par une articulation plus énergique . . . . Mais en position intervocalique les consonnes géminées sont réparties entre deux syllabes, leur implosion appartenant à la syllabe précédente et leur explosion à la syllabe suivante. En outre ces consonnes géminées n'apparaissent que dans les positions où la langue en question admet des groupes de consonnes; elles . . . sont traitées en général exactement comme les groupes de consonnes. Toutes ces marques indiquent une valeur polyphonémique, c'est-à-dire invitent à interpréter les consonnes géminées comme des groupes formés de deux consonnes identiques.17

The following features are characteristic of the CLU geminates. In intervocalic position, implosion and explosion are separated by a syllable boundary (cf. Ziżyński's description, summarized above, Sec. 1.3111). Geminates do not occur in positions where consonant clusters are not admitted. Geminates are subject to certain constraints that seem to be general for all sequences of non-vowels.18 It is thus

17 Principes, p. 184 f.
18 This statement is elaborated below, Sec. 1.3134.
perfectly possible, from a theoretical point of view, to interpret the CLU geminates as clusters. Since their interpretation as functional units requires the introduction of several additional segments, and of one extra distinctive feature, in the description, this interpretation should not be accepted unless strong arguments in its favour are found.

Shevelov remarks that "... movna svidomist' spryj-maje joho [podovženyj pryholosnyj] jak podvojenyj i nezelež-no vid pys'ma ... ."\(^{19}\) When he nevertheless chooses to interpret geminates as lengthened consonants, he appears to prefer a counter-intuitive solution to one that seems more natural. He adduces only one reason for this step, viz that articulatorily there is only lengthening: "... u slovi 'čyslennyj' ne vymovljajemo dvox 'n' ... a til'ky majemo podovženu vymovu ... ."\(^ {20}\) Since Shevelov agrees with Žiliński (summarized above, Sec. 1.3111) that "... meža skladu proxodyt' čerez podovženyj pryholosnyj ... ."\(^ {21}\) his only argument in favour of consonant length is clearly based on a failure to trace the audible intensity "valley" that separates geminates to its articulatory source.\(^{22}\)

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19 Shevelov, Narys, p. 379.  
20 Loc. cit.  
21 Loc. cit.  
22 In his chapter on the syllable, Shevelov does do this: "... členuvannja na sklady maje xarakter čysto fonetyčnyj (artykuljacijnyj)."
Dejna advances only one argument for his "korelacja podwojenia," the fact that geminates are found within single morphemes.²³ This argument is far from convincing. That geminates occur within single morphemes can be considered the minimal prerequisite for their interpretation as unit phonemes. But it can by no means be considered sufficient grounds for such an interpretation.²⁴

Within the framework of Morris Halle's theory of phonology no a priori considerations of the relative merits of alternative solutions are relevant. It was stated above that, from the point of view of economy of description, geminates should be treated as clusters unless strong arguments against such a solution could be found. The only argument strong enough to force the rejection of this solution is that it fails to meet Condition 3 and/or Condition 4. It will be evident from the following paragraphs that not only does the solution adopted here not violate Conditions 3 and 4, but it alone makes it possible to state certain simple operations in CLU inflection and derivation in a simple fashion.

²³ Cf. the quotation in Sec. 1.3112. And yet, he does not set up any ∗n, ∗s, or ∗v, all of which occur within morphemes, cf. Sec. 1.3131.

²⁴ Apparently Dejna has misunderstood Troubetzkoy's statement to this effect, Principes, p. 185.
1.3131. Shevelov sets up the following phonemes not recognized by Dejna: */b: v: m: d: z: ʒ: n: s: j:/. They are all exemplified in Shevelov's Category A., where any attempt at morphological analysis will require their interpretation as clusters, and not as unit phonemes. Examples of these geminates are given in Chapter V as illustrations of Rule P 11a. Only */v: n: s:/ are attested outside Category A. */n:/ is attested both in Category E. and among the unclassifiable items, i.e. in single morphemes; whereas */v:/ and */s:/ are attested only in the latter group. There are no cogent reasons why these cannot be considered clusters. As for */v:/, which outside Category A. is attested only in bovvan 'image' (and derivatives), it can be added that the maximally distinct allophones of {v} here, [bowván], make their interpretation as a functional unit rather unsatisfactory. */s:/ is attested outside Category A. only in ssaty 'suck' (and derivatives). That the [s:] here represents a cluster {ss} is evident from the equation {rov-ú}:{vy-rov-áj-u} = {žv-ú}:{vy-žv-áj-u} = {šs-ú}:{vy-šys-áj-u} 'tear; tear out; call; call out (trans.); suck; suck out' (1.sg.pres.).

1.3132. Shevelov's Category D. exemplifies Dejna's Volhynian "*c*" (i.e. */č:/), as well as */š:/,. Here, as in Category A., an attempt at morphological analysis would require that */č: ʒ:/ be reinterpreted as clusters,
respectively /qɛ/ and /ʂʂ/. The distribution of the "allo-
morphs" of the 2.sg. person marker (/mỳj-e-ʂ/; /mỳj-e-ʂ-ʂa/
'you (sg.) wash' (trans. and intr.)), the third person mark-
er (/mỳj-u-ʈ/, /mỳj-u-ʂ-ʂa/ 'they wash' (trans. and intr.)),
and the reflexive enclitic (cf. /mỳj-u/; /mỳj-u-ʂa/
'I wash' (trans. and intr.)), is accounted for by the dis-
tributional constraints of the language (the sequences [ʂʂ] and
[ʈʂ] are not admitted within word boundaries). This
means that, given the rules P 4a, 4b, 9a, 9f, and 11a, the
words just mentioned can be adequately represented as
follows: {mỳjeʂ}, {mỳjeʂʂa}, {mỳjuʈ}, {mỳjuʂa}, {mỳju},
{mỳjuʂa}.

1.3133. Dejna and Shevelov agree on setting up */q: t:: q: ʂ: c: ʂ: l:/.
These are all represented in Shevelov's Category C. It is impossible to establish a
single stem for nom.sg. and in.sg. in words like the
following unless these geminates are considered clusters:
/miʂ/, /mìʂ-ʂu/ 'copper'; /tɨʂ/, /tɨʂ-ʂu/ 'shadow'; /maʂ/,
/máʂ-ʂu/ 'ointment'; /siɬ/, /siɬ-ɬu/ 'salt' (cf. /krov/,
/krov-ɬu/ 'blood' and /dvir/, /vɪr-ɬu/ 'door').

A similar situation is found in Category B., where
it is not possible to isolate from the underlying bases the
derivative suffix that forms the numerous collective and
abstract neuter nouns in this group unless the geminates are
analysed as clusters. Compare /lʊd-y/ 'people', /bez-ɭʊq-

In both categories an automatic alternation is involved. The only clusters of a consonantal segment followed by /j/ that are admitted in the native vocabulary of CLU are those beginning with a labial consonant or /r/. The examples just listed partly illustrate how /j/ (both the initial of the desinence /ju/ and the derivative suffix) alternates with the duplicate of whatever single acute consonant or continuous liquid precedes it. An accurate formulation of the distributional constraints involved can be found in rules P 2c, 5b, 5c, 6, 7, 10b, 11a, and illustrations of these rules, in the corresponding sections of Chapter V. This alternation, incidentally, also accounts for the unclassifiable lľjú - lľješ, as might be seen from the equation /byj/ : /bju/ : /bješ/ 'beat' (2.sg.impr.; 1.sg. pres.; 2.sg.pres.) = /pyj/ : /pju/ : /pješ/ 'drink' = /lyj/ : /ľu/ : /ľeš/ 'pour' (cf. the examples to rule P 8g).

1.3.34. One additional point should be mentioned in this connection. It was mentioned above (Sec. 1.312, n.18) that geminates are subject to certain constraints that can be considered general for all clusters. In word final
position and in the context C...V no sequences of consonantal segment followed by /j/ are attested. In these contexts, geminates are not admitted. Thus, for instance, to /pid-bořiq-qa/' chin' (nom.sg.) corresponds the gen.pl. /pid-bořiq/ with a zero desinence; and, while the in.sg. of /suṭ/ 'gist' is /sūṭ-ṭu/, the corresponding form of /čaṣṭ/ 'part' is /čaṣṭ-u/ (cf. rules P 6 and 10b). In the context R...V, sequences of labial consonant plus /j/ are admitted, but sequences of /r/ plus /j/ are not attested. Neither are geminates: the in.s. of /smerṭ/ 'death' is /smerṭ-u/ (cf. rule P 10b). Thus, not surprisingly, there is a fair degree of similarity between the constraints governing geminates and those governing clusters of labial consonant or /r/ followed by /j/.

To sum up the preceding few pages, there is no need to set up a series of geminate morphonemes and a distinctive feature of consonant length in CLU. The vast majority of geminates straddle morpheme boundaries, where they arise as the result either of the chance meetings of identical morpheme final and morpheme initial segments, or of the distributional constraints of the language. Only in a handful

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25 Dejna's assertion that geminates do not occur in word initial position (cf. the quotation in Sec. 1.3112) does not appear to be factual. Cf. the forms of ssatvy 'suck' and lyty 'pour', discussed in Sec. 1.3131, 1.3133.
of instances are geminates found within morphemes. Some of these have been mentioned already (Sec. 1.3131). A few more will be mentioned in the discussion of rule MS 12b in Chapter IV, Sec. 2.2.

1.32. The question of distinctive sharpening of generally only non-distinctively sharpened consonants involves two groups of consonants, the palatals and the labials. They are most conveniently discussed separately.

1.321. In position before a vowel, palatal consonants are, generally speaking, sharpened before /i/ and plain elsewhere. An exception are the soft geminate palatals which may precede not only /i/, but also /a/ and /u/. Thus, for instance, parallel to /dvir/, /dvir-ju/ 'door' (nom.sg. and in.sg.), and /sút/, /sút-tu/ 'gist', there is [nĭç], [nĭç:u] 'night', which could be adequately phonemized as /nĭç/, /nĭç-ju/ since all [ç] represent /çj/ (the three in.sg. forms are morphemically {dvírju}, {súťju}, {nĭčju}).

In addition, however, single sharpened palatals occur in a small number of words before /a/ and /u/. No description known to this writer sets up special phonemes to take care of these palatals, and indeed there is no need to. Like the corresponding geminates, they are found only at morpheme boundaries. Unlike the geminates, however, they
are always preceded by a consonantal segment. From a comparison of /čest/, /čest-u/ 'honour' (nom.sg. and in.sg.), and /bež-čest-Ø-a/ 'ignominy' on the one hand, and [žowč], [žówču] 'gall' and [bežówča] 'acholia' on the other, it is evident that the last two items result from the constraints that were discussed in Sec. 1.3134. Morphonemically they can be written {žovču} and {bezřžovčja}.

1.322. The distinctively sharped labial consonants, like the palatals discussed in the preceding section, are limited to a small number of words. Shevelov lists the most important of these "nexarakterystyčni reštky." He recognizes the distinctive function of the sharped labials, but does not set up any sharped labial phonemes. Dejna does not mention distinctively sharped labials.

It was mentioned above (Sec. 1.3134) that no sequences of consonantal segment followed by /j/ is attested in the context C...V. It is in this context that the distinctively sharped labials occur. It is consequently possible to represent every distinctively sharped labial as a morphonemic sequence of labial plus {j} and formulate the phonological rules accordingly (cf. rules P 5a and 7).

This solution makes it possible to formulate general morphological rules describing the {j} "epentheticum" added

26 Shevelov, Narys, p. 377.
to morphemes ending in a labial consonant before suffixes like \{ân\} and \{âč\}. Cf. \{déřev-o\} 'wood', \{déřevj-án-yj\} 'wooden' and \{ťm-á\} 'darkness', \{ťmj-án-yj\} 'darkish' (the adjectives ultimately become [derevjányj] and [ťmányj]); \{korôv-a\} 'cow', \{koróvj-ač-yj\} 'pertaining to a cow' and \{mávp-a\} 'monkey', \{mávpj-ač-yj\} 'pertaining to a monkey' (ultimately [koróvjačýj] and [máwpačýj]).

The distinctively sharped labials occur not only at morpheme boundaries, but also within morphemes. There seems to be no better way of representing such words as [gyáto] 'holiday', [cíx] 'nail' than \{śvjàt-o\}, \{ɕvjàx\}. This solution, however, has certain consequences for the morpheme structure rules. These will be discussed in Chapter IV, Secs. 1.1 and 2.2.

1.323. It was mentioned above (Sec. 1.3133) that the only sequences of consonantal segment followed by /j/ which are admitted in the native vocabulary of CLU are those beginning with a labial consonant or non-continuous liquid. In the preceding section it was shown that it is possible to analyse sharped labial consonants in the context C...V as morphonemic sequences of labial followed by \{j\}. In the context C...V also the sharped non-continuous liquid occurs.

Since /ř/ is a phoneme of CLU, there would be no motivation in a traditional phonemic analysis (leading to the establishment of a phonological representation satisfying
both of Conditions 3 and 3a) to push the analysis of, for instance, [bezy\textit{itr}\textsubscript{u}] 'with no wind' and [bezy\textit{itr}\textsubscript{u}] 'dead calm' (dat.sg.) beyond /bez\textit{vitr}/ and /bez\textit{vit}\textsubscript{r}/. The parallelism of /\textit{vira}/ 'faith', /bez\textit{virja}/ 'atheism' and /\textit{viter}/ 'wind', /bez\textit{vitr}\textsubscript{a}/ 'dead calm', however, suggests that the latter contains the morpheme \{j\}. In a morpho-
nemic representation, it can be adequately written as
\{bez\[3\textit{vitr}-j-a\} provided a rule is formulated to the effect
that in the context C...V \{\textit{fj}\} is realized as [\textit{f}]. Cf.
rules P 5d and 7.

The Vowels

2.11. The distribution of the principal allophones
of the CLU vowels is described in rules P 11c to 14 and
exemplified in the corresponding section of Chapter V. In
the present section the vowels will be briefly characterized
in articulatory-auditory terms and related to the distinctive
feature definitions decided on for this description. The
following section will add a few remarks on some possible
problems connected with these definitions.

On the quadrilateral in Figure III the circles indi-
cate the approximate values of the six accented vowels as
they are realized in unchecked position, e.g. in isolation
(as names of the letters \textit{i}, \textit{y}, \textit{u}, \textit{e}, \textit{a}, \textit{o}).\textsuperscript{27}

\textsuperscript{27} The quadrilateral represents the eight primary cardinal
Figure III. The six accented vowels of CLU in unchecked position. Cf. p. 38 ff.
From this figure it can be seen that the CLU vowels constitute two series opposed articulatorily as wide vs. narrow, i.e., acoustically, as compact vs. diffuse.

{ú}, {u}, {ö}, {o}, while generally realized as back vowels, undergo varying degrees of fronting when adjacent to sharped non-vowels (stressed and unstressed [ú], [ö]), particularly when surrounded by sharped non-vowels (where {u}, {o} may be realized as [ü], [ö]). The feature that consistently distinguishes them from the remaining vowels is labialization. In the present description, therefore, they are defined as flat, as opposed to the rest of the vowels, which are natural.

{u} and {o} are generally more lax than the corresponding accented vowels, and, at the same time, less extreme: {u} is less diffuse, {o}, less compact (e.g. when not contiguous to a sharped non-vowel, respectively [u'] and [ö']). The raising of {o} is particularly marked in pre-tonic position when the following syllabic of the same word is [u] or [i]. In this position {o} may be realized as [u'] in allegro speech.

Though {y} and {e} vary considerably in terms of cardinal vowels of the IPA. Cf. The Principles of the International Phonetic Association, London, Dept. of Phonetics, University College, 1949 (Reprinted 1958). Note that the symbols used here are not those of the IPA.
tongue height, and \{\dot{a}\}, \{a\} vary along the front-back axis, \{\acute{y}\}, \{y\} and \{\acute{a}\}, \{a\} are consistently opposed to respec­tively \{i\}, \{i\} and \{\acute{e}\}, \{e\} as retracted to advanced. In the present description, therefore, \{\acute{y}\}, \{y\} and \{\acute{a}\}, \{a\} have been defined as grave, and \{i\}, \{i\} and \{\acute{e}\}, \{e\}, as acute.

\{y\} and \{e\} are realized as more lax, and less extreme, than the corresponding accented vowels. \{y\} is generally lowered to a \([y\cdot]\). \{e\} is usually realized as \([y\cdot]\) when the following syllable of the same word is a diffuse vowel, otherwise, as \([e\cdot]\). A careful style, however, may distinguish \{y\} and \{e\} in all positions.

\{\acute{a}\} and \{a\} are somewhat advanced (i.e. become less grave) when adjacent to a sharp non-vowel (stressed and unstressed \([\ddot{a}\])). Their fronting is especially marked when they are surrounded by sharp non-vowels (unstressed, and occasionally also stressed, \([\ddot{a}\])).

2.12. In view of the complete absence of any acoustic data on the CLU vowels, it is obviously impossible to discuss their feature composition in any detail. Even the following very general remarks are fraught with all the weaknesses of pure speculation, but some comments on the vowel definitions decided on are clearly required.

The sonority feature compact vs. diffuse seems the
least problematic. As defined in Fundamentals, this feature is related to the ratio of the volume of the front resonance chamber of the vocal tract to that of the back resonance chamber. This ratio is higher for wide vowels than for narrow vowels. In terms of the positions of the first two formants (F1 and F2), a high ratio between the two resonance chambers means centrally located F1 and F2, a low ratio, widely separated F1 and F2. In practice, the position of F1 may in some languages be sufficient for the identification of the feature. It is likely that this is the case in CLU, though possibly a more complex identification procedure is required. In any case, the difficulty of defining a threshold between compact and diffuse vowels will be the same. Such a threshold will have to

28 P. 29 ff; also the discussion in Fant, op. cit., p. 217.

29 This is the situation in Russian (where the feature is split into two, diffuse vs. non-diffuse and compact vs. non-compact). Cf. Sound Pattern, p. 126: "[Diffuseness] . . . is acoustically signalled by a maximally low first formant."; and p. 127: "Compactness is signalled by a maximally high first formant." The same view is held by V. I. Grigor'ev ("differencial'nye priznaki russkix glasnyx /u, y, i/", Voprosy Jazykoznanija, XI:1, 1962, pp. 10-30), who, on the basis of the dependency of F1 on the fundamental, argues against defining absolute values of diffuseness and terms the diffuse vowels of Russian simply "krajnie", with reference to their extreme, i.e. maximally low, F1.

discriminate properly between the high F1 positions of \([y^\ddagger]\) and \([u^\ddagger]\) and the low F1 positions of \([e^\ddagger]\) and \([o^\ddagger]\).

The tonality feature which is considered primary for the CLU vowels, the feature flat vs. natural, is related to the shape of the front orifice of the mouth resonator: Labialization causes a downward shift of some of the components of the spectrum.\(^{31}\) In Russian, the feature flat vs. natural "... poses no problem. Its acoustical correlate is the position of the second formant."\(^{32}\) It seems reasonable to assume that a similar situation exists in CLU. The most advanced articulations of \([\ddot{\text{u}}]\) are possibly more advanced than \([y]\), but can, even then, be expected to have a lower F2, due to the lip rounding. The same relation probably holds between \([\ddot{\text{o}}]\) and \([\text{a}]\). It is suggested, then, that flat vowels can be defined as having an F2 at, or below, a yet to be defined critical frequency.

The second tonality feature relevant to the specification of the CLU vowels, the feature grave vs. acute, presents a less clear-cut picture than the two features discussed above. In \textit{Fundamentals}, gravity is defined as a concentration of energy in the lower frequencies of the spectrum.\(^{33}\) The feature is thus the acoustic correlate of the back–front opposition in the vowels. The retraction of the

\(^{31}\) Cf. \textit{Fundamentals}, p. 31; and Fant, p. 219.

\(^{32}\) \textit{Sound Pattern}, p. 130.

\(^{33}\) \textit{Fundamentals}, p. 31.
tongue from the [i] position to that of [y], or from that of [e] to that of [a], is accompanied by a downward shift of F2 and thus lowers the energy concentration of the spectrum. It should be noted, however, that this lowering of the energy concentration is somewhat counteracted by a concomitant upward shift in F1 ([y] is less diffuse than [i], [a] more compact than [e]). In view of the lack of acoustic data no specific identification procedure can be suggested.\(^{34}\)

2.13. The present description of the CLU vowels conflicts with the statement in Preliminaries that Ukrainian has "... two classes of grave vowels — flat as /u/, plain as /i/ — and only a single, optimal class of acute vowels — plain as /i/."\(^{35}\) This statement agrees well with the view, expressed in Preliminaries and elsewhere,\(^{36}\) that the feature grave vs. acute is more fundamentally important in languages in general than the other tonality features. It does not, however, agree with the phonetic facts of CLU.

\(^{34}\) Cf. Preliminaries, p. 29 ff.


\(^{36}\) Preliminaries, p. 32 ff.; also Fundamentals, p. 40 ff.
As mentioned above, the labialized vowels have both back and front allophones. Gravity, then, cannot properly be considered an invariant attribute of the labialized vowels, but must be treated as a redundant feature.

2.2. Most treatments of CLU phonology describe the vowel system in terms of six vowel phonemes and a phoneme of stress. In addition, it is usually recognized that the distribution of the six vowel phonemes, independently of the stress, is somewhat uneven. The present section will outline the distributional characteristics of the CLU vowels as they present themselves to the analyst. The discussion will in particular concern the phonemes /i/ and /y/, which have been the object of special attention in the literature on CLU. In this connection, some attempts to reduce the vowel inventory to five phonemes will be reviewed. But first a statement of the distributional facts is in order.

2.21. Since vowel chains do not occur in the native vocabulary of CLU, it is necessary to distinguish only two typical positions for vowels in the CLU word. In the

37 Or, as A. V. Isačenko, "Versuch einer Typologie der slavischen Sprachen", Linguistica Slovaca, I (1939), p. 71, in terms of six stressed and six unstressed vowels. In the following, the feature accented vs. unaccented will, for simplicity's sake, be left out of consideration.
following they will be termed initial (following a pause) and medial (following a non-vowel) respectively. The latter position is numerically the more important and will be dealt with first.

2.211. Figure IV presents, in a rough phonetic transcription, all possible sequences of non-vowel followed by vowel, with the exception of those described in notes (b) and (c). The latter are best left aside for a moment, but will be taken up below.

From this table several facts are evident. Firstly, CLU has six vowel phonemes, /i e y a u o/. Secondly, the consonantal phonemes fall into two categories, that of the "paired" and that of the "unpaired" consonantal phonemes. The unpaired consonantal phonemes — the labial, the palatal, and the velar consonants— are sharped before /i/ and plain before the rest of the vowels. In the paired consonantal phonemes, on the other hand — the dental consonants and the liquids — sharpening plays a distinctive rôle. Thirdly, the paired consonantal phonemes form two groups, which may be called "the strong" and "the weak". In the strong group,

38 I. Z. Petlyčnyj ("Do pytannja pro systemu holosnyx fonem v sučasnej ukrajins'kij literaturnij movi", Pytannja ukrajins'koho movoznavstva, I (1956), p. 16) counted 13000 vowels and found that 94 per cent were in medial position, 5.6 per cent, in initial position; .4 per cent were the second segment in vowel chains (all in foreign words).
Figure IV. The occurrence (+) and non-occurrence (-) of vowels following non-vowels and pause, and of non-vowels preceding vowels and pause.

NOTE: To the generalizations of the table the following details should be added: (a) The sequence [jy] occurs only across morpheme boundaries; cf. Sec. 2.2213. (b) Sharped labials and palatals occur before [au] under the circumstances discussed in Sec. 1.32. (c) Sharped dentals and [l] occur before [ye] across the suffix boundary ([4]); cf. Chapter III-B.
which comprises the non-strident dentals and the continuous liquids, sharping is distinctive before /i a u o/, but not before /e y/. In the weak group, which comprises the strident dentals and the non-continuous liquids, sharping is distinctive before /a u o/, but not before /i e y/.

In a phonological representation the distributional regularities just summarized should obviously be exploited in conformity with Condition 5. They result from distributional constraints which can be stated in a few simple rules. Since the exceptions mentioned above (notes (b) and (c) on Figure IV) are easily delimitable, they do not restrict the validity of these rules (i.e. they are not genuine exceptions), but merely limit their applicability (i.e. they make the rules applicable to specific contexts only). The rules that describe the distribution of non-distinctive sharping before vowels are numbered P 5a, 5c, 8b, 8c, 8d, 8f, 8g. Examples and details of the operation of these rules are found in the corresponding sections of Chapter V.

Any of the six vowel phonemes can occur after [j]. However, as stated in note (a) on Figure IV, the sequence [jy] occurs only across morpheme boundaries. This means that the feature grave vs. acute in non-flat diffuse vowels following {j} need not be specified in the representation of morphemes in the dictionary, but can be specified by a
morpheme structure rule. Cf. rule MS 12c.

2.212. In initial position, as stated in Figure IV, any of the six vowels can occur.

2.22. The last statement, as well as several of those preceding it, needs qualification. The fact that the orthoepic norms of CLU tolerate certain deviations from the standard just surveyed makes it necessary to consider also other varieties of CLU. This will be done in the following pages. At the same time, the findings of some other studies of CLU phonology will be discussed.

2.2211. In some varieties of Ukrainian the group of strong paired consonantal phonemes includes the strident dentals (while the non-continuous liquids alone constitute the weak group). The differentiation of sharped and plain strident dentals before /i/ is by some observers considered atypical of CLU, but is considered acceptable according

39 This is characteristic of dialects of the Dniester Region, of Podolia, and in the south of the Middle Dnieper Region. Cf. F. T. Zylko, Hovory ukrajins'koi movy, Kyjiv, Radvans'ka Škola, 1958, pp. 73 ff., 107 ff., 150 ff.

to the current Soviet norms. For the present description it was decided to disregard this phenomenon, but it could easily be accommodated. The present set of phonological rules presupposes a dictionary and a set of transformational rules that would yield sequences like {*ik}*masc.* past & 'chopped', {*ik}*sg.*nom.* 'juice', and {*il}*pl.*gen.* 'villages', and turn them into {*ik}, {*ik}, {*il}. Rule P 8c then turns these into [*ik], [*ik], [*il]. To yield the pronunciation [*ik], [*ik], [*il], typical of the dialects in question, only one change in the phonological rules is necessary, viz the suspension of rule P 8c. In addition, however, it is necessary that all strident dental consonants be specified as sharpened before {i}, {i} in the dictionary.

2.2212. In some varieties of Ukrainian the division of the paired consonantal phonemes into strong and weak has been eliminated: all paired consonantal phonemes are weak, i.e. are non-distinctively sharpened before /i/. This


42 This situation predominates in the south-eastern group, but is also typical of some south-western dialects, e.g. in
phenomenon was formerly considered inconsistent with the orthoepic norms of CLU, but is currently not merely accepted, but preferred, in the URSR. The spread of this phenomenon seems to be favoured, not only by the attitude of educators like Žylko; and the absence (since 1928) of an orthographic means of differentiating minimal pairs like [dij] 'milk!' : [di̞j] 'act!' (both spelt di̞j), [nis] 'nose' : [nis] 'carried' (both nis), or [liz] 'of willows' : [liz] 'crawled' (both liz); but by the drift of the language itself. The varieties of CLU that do not distinguish sharped and plain paired consonantal phonemes before /i/ are covered by the alternative rules given in Chapter V, Sec. 3.

2.2213. The opposition of [ji] and [jy] across morpheme boundaries is not maintained by all speakers of

the Prut Region, and in the Carpathian group. Cf. Žylko, Hovory, pp. 73 f., 103, 134, 151, 160 f., 167.

43 Synjavs'kyj, p. 10 f.

44 Cf. the following remarks by Žylko on the formerly orthoepic distinction between sharped and plain paired consonantal phonemes before /i/: "Dexto z poslidnykiv namaha-jet'sja cju rysu obstojuvaty nibyto jak prytamannu sučasnej ukrajins'kij movi. 'Prote dlja c'oho nemaje pidstav . . . . My vražajemo cju osoblyvist' vymovy peredn'ojazyčnyx pryoholosnyx . . . . dialektnoju, i jiji treba unykaty v sučasnej literaturnij movi." ("Dialektni vidimnosti pryoholosnyx fonem ukrajins'koi movy", Ukrajins'ka mova v školi, XI:4 (1961), p. 12).
CLU. It is described as standard by Synjavskyj, but according to Ziłyński it is not typical of the speech of the "educated":

Każe akcentowane i, bez względu na swe pochodzenie, brzmi po j w wymowie wykształconej zwykle jak jį (ji) . . . . W gwarach wschodnich i zachodnich przeważa w takiej pozycji ji (j szerokie), które w gwarach galicyjskich obniża się do yė, o . . . .

Unfortunately, this writer has found no mention of this matter in the recent Soviet literature on Ukrainian phonetics available to him.

For the speakers that do not distinguish [ji] and [jy], the feature grave vs. acute in non-flat diffuse vowels is predictable after {j} when no word boundary intervenes. For these speakers, the rule MS 12c must be deleted, and a phonological rule with analogous effect must be inserted at a later place (cf. the optional rule given in Chapter V, Sec. 3).

2.222. It was stated above that all the six vowel phonemes can occur in initial position. This statement requires a few comments regarding the status of initial [i] and [y].

46 Ziłyński, p. 12.
Ziłyński makes the following observation:

Na początku wyrazu wymawia się etym. i w gwarach wschodnich i w wymowie wykształconej wschodniej i zachodniej w pozycji akcentowanej i nieakcentowanej z nieznacznymi wyjątkami jak yę. . . . Gwary zachodnie wykazują pod tym względem wahania. W jed­nach z nich słyszy się przeważnie yę, w innych zaś w pozycji akcentowanej ie . . . w zgłosce nieak­centowanej najczęściej i. . . . 47

The "unimportant exceptions" he lists are ispyt, im'ja, Ivan, all native Ukrainian words.

Synjavs'kyj limits himself to stating that the stressed orthographic i in words like inšyj, inodi, inde, istyk, iskra, ihraška, irod, iš is pronounced as y, and adds that "... ce odna z moźlyvyx vymov, bo vymovljajut'–sja vony j z i." 48

Shevelov mentions the problem of initial [i], [y] both in his textbook (Narys, p. 365) and in the article "Phonema Errans" (p. 404, n. 7). In both places he dis­cusses the "intermediate place of /y/ between /i/ and /e/.

As an illustration of the close affinity of /y/ and /i/, he mentions in Narys that

Ut toj čas, jak u vymovi sliv inšyj, inodi, indyj, istyk, irij zberihajet'sja vymova y− (xoč i pyšet’–sja i−), v inšyx slovax zvyčajno vymovljajet'sja i−, napr., ity, im'ja, ispyt.

47 Ziłyński, p. 20.

48 Synjavs'kyj, p. 173.
In "Phonema Errans" he evaluates this situation in these words:

... the indiscriminate use of y — i does not exist either, except ... at the beginning of a word: although linguistic consciousness distinguishes the pronunciation of y — i at the beginning of words (ynšyj — inšyj, orthographical: inšyj 'other'), but the two variants of the pronunciation are perceived as equivalent.

From the above quotations it is evident that the distribution of initial [i] and [y], at least in some varieties of CLU, is determined not by the phonetic context, but by the linguistic habits of the speakers. This means that initial [i] and [y] represent two phonemes. The paucity of words with initial [i] and [y], and the absence of minimal pairs — together with the regional variations mentioned by Ziłyński — suffice to justify the orthographic convention of writing only initial i. But these facts do not constitute a sufficient basis for considering initial [i] and [y] positional, or stylistic, or free variants.

In this writer's view, Shevelov's assertion that "... the two variants of the pronunciation are perceived

49 In the article quoted above, Shevelov seems to say that initial [i] and [y], after all, are variants of a kind. In the absence of genuine paronyms, a pair like [ɪspyt] 'test' and [jfskra] 'spark' would tend to indicate the opposite. In any case, whereas the presence of minimal pairs implies a phonemic opposition, the absence of minimal pairs does not imply the absence of a phonemic opposition.
as equivalent." is not accurate. Pronunciations with [i] and [y] are probably equivalent only when the context makes any deviation from the listener's norm relatively insignificant. This is undoubtedly usually the case, but it is not always. 50

Since the elimination of the opposition between {i} and {y} in initial position is accepted by the current Soviet norms, an optional phonological rule has been formulated (cf. Chapter V, Sec. 3). It should be noted that, since all varieties of Ukrainian distinguish morpheme initial {i} and {y} in derivational and inflectional suffixes, the morpheme structure rules are not affected.

In some of the varieties of Ukrainian that do distinguish initial {i} and {y} there is some variation from one speaker to another as to the exact distribution of these two morphonemes. Thus, one speaker may habitually say [jśkra] 'spark', [jstyk] 'plough-scraper', [jspyt] 'test',

50 Asked for the meaning of the word [ива], one informant repeated the sound sequence several times, but could not assign it a meaning. Supplied with the additional information that this might be a sort of plant, possibly a tree, he exclaimed, 'Aha, bačyte, iva, a u nas skazaly yva.' and proceeded to define iva as a tree similar to the loza (both are kinds of willow). Cf. Troubetzkoy's 2nd rule (Principes, p. 49 f.): "Si deux sons apparaissent exactement dans la même position phonique et ne peuvent pas être substitués l'un à l'autre sans modifier la signification des mots ou sans que le mot devienne méconnaissable, alors ces deux sons sont des réalisations de deux phonèmes différents." (Underlining supplied. H.A.).
another, [ýskra], [ístyk], [íspyt]. This sort of variation can only be accounted for as due to differences in morpheme shapes on the dictionary level and is consequently, outside the scope of a phonological description.

2.3. The literature on Ukrainian phonology contains, as was mentioned above, a number of references to a Ukrainian five-vowel system. Since some of these have received general recognition, they deserve a few words of comment.

2.31. Roman Jakobson, in his study of the history of the Russian phonological system, sets up a five-vowel system for the south-eastern dialect group:

Dans les parlers orientaux de l'ukrainien méridional, les consonnes ont pris le son mou devant tout i p rovenant de diphthongue. i est naturellement envisagé comme variante extragrammaticale combinatoire de i conditionnée par position après consonne dure; i est caractéristique que, même objectivement, i soit plus proche de i dans les parlers orientaux que dans les parlers occidentaux de l'ukrainien...

Jakobson's description fits not all the dialects of the south-eastern group, but only those in which non-distinctive softening of all consonantal phonemes before /i/ coincides with the elimination of the /i/:/y/ opposition in initial

51 "Remarques sur l'évolution phonologique duerusse comparée à celle des autres langues slaves," TCLP II, Prague, 1929.
position as well as after /j/. In these dialects, /i/ and /y/ can indeed be considered to be in complementary distribution, but only if labial, palatal, and velar consonants be considered paired. Thus, collapsing /i/ and /y/ into one phoneme, */i/*, entails the establishment of a dozen more consonant phonemes having a distinctive function only in one position, viz before */i/*. This is clearly not a very economical solution. It is interesting to note that the phonetic properties of [i] and [y], which Jakobson mentions in passing, do not per se recommend this solution. 52

2.32. Karol Dejna, in the article mentioned above, follows Jakobson in setting up a six-vowel system, i e a o u, for the south-western group, and a five-vowel system, i e a o u, for the south-eastern dialects (p. 149). At the same time, he considers sharpening non-distinctive in labials (p. 149), velars, and palatals, as well as in the non-continuous liquids (p. 150). This creates a problem: the differentiation of words depends on whether the positional variants [w p b y r] stand before */i/*, or the "positional variant" [y] follows */m p b v r/. It is obviously not satisfactory to represent both [wij]

52 Cf. Preliminaries, p. 5 f.
and [myj] as */miy/, [piw] and [pyw] as */piy/, [biy] and [byj] as */byy/, and so forth, so Dejna proposes to mark the occurrence of [y] by means of a diacritical mark on a preceding symbol representing a labial consonant or non-continuous liquid (p. 150). This, of course, is tantamount to recognizing either /i/ and /y/ or distinctive sharpening in labials and the non-continuous liquids while obscuring which distinction is being recognized as phonemic and which is held to be allophonic.

It should be noted that Dejna's description implies that /i/ and /y/ are not distinguished after palatal or velar consonants in the south-eastern dialects (i.e. that sequences like [xi], [ky], unlike sequences like [pi], [py], are phonemically identical). This implication finds no corroboration in the dialect texts available to the present writer, and it is incorrect with reference to CLU. On the other hand, Dejna's */r/, corresponding to CLU {f} and {r}, is typical of most dialects in the south-eastern group.

53 Note in preceding examples that Dejna's */i/ includes the phoneme /j/; cf. Sec. 1.2.

54 Żylko, Narasy contains 28 texts (comprising some 12000 words) from the Middle Dnieper Region (pp. 271-277), the Sloboda Region (pp 277-288), and the Steppe Region (pp. 288-299).
2.33. Edward Stankiewicz's characterization of Ukrainian in his paper on Slavic typology agrees largely with Dejna's description: Standard Ukrainian has five vowels, the Western Ukrainian dialects, six (p. 311). The feature sharp vs. plain is distinctive only for dental consonants and continuous liquids. He adds that "... in Standard Ukrainian ... /r'/ is a free variant [sic]." (p. 309) There would be little point in discussing this description further if it were not for the fact that Stankiewicz has tried to apply it, without major changes, in his study of Ukrainian morphology.

Instead of the automatic distribution of plain and sharped consonantal segments before /i/ and /y/ which was outlined above (Sec. 2.21), Stankiewicz finds a maze of morphophonemic alternations which have no "... clear morphological function, but are distributed, as if haphazardly, in specific grammatical categories ... ." and


56 "The consonant alternations in the Slavic declensions," Word, XVI (1960), pp. 183-203. From the examples */javor'1/ and */javori/ (p. 190, n. 11) it is apparent that Stankiewicz has modified his views regarding the status of /r'/ (The two words should be written /javori/ (with the proper /i/) and /javori/.)
are "... quite complicated." The reasons are obvious. Given the CLU forms of the adjective 'lean' listed in Column A below, the eastern forms in Column B can easily be inferred by means of a rule that sharps all consonantal segments before /i/. If /i/ and /y/, however, are collapsed into a */i/, as in Column C, it becomes necessary to state for each single suffix beginning with */i/ whether or not it requires a preceding consonantal segment to be sharpened.  

<table>
<thead>
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<th>B</th>
<th>C</th>
</tr>
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<tr>
<td>gen.pl.</td>
<td>/xud-ŷx/</td>
<td>/xud-ŷx/</td>
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57 Op. cit., p. 189 f. and n. 11

58 Stankiewicz's remark, op. cit., p. 197, that "... it is interesting to notice the phenomenon of free variation in the final consonants of adjectival stems; the tendency is however, to generalize either the hard or the soft consonant throughout the declension of adjectives ... ." may be noted in passing. It is supported with a reference to Żyłko, Narysy, pp. 165, 174. Characteristic of the dialects in question is not the free variation in the final consonants of adjectival stems, but the fact that "Porivnjano najbil's vyrazno zberezene ... davnje rozrznjuvannja tverdyx i m'jakyx osnov prykmetnykiv ... ." ( Żyłko, Narysy, p. 162). The examples on pp. 165 and 174 illustrate how the generalization of hard stem final consonants in the adjectival paradigm, typical of CLU (cf. Column A above), cannot be maintained in some of the dialects Stankiewicz is discussing (cf. Column B above).
From the above considerations it should be clear that a morphonemic solution analogous to the phonemic solution advocated by Dejna and Stankiewicz would fail to satisfy Condition 5 by violating Conditions 3 and 4. Such a solution could be modified so as to satisfy Condition 3 in one of two ways: by the addition of a dozen consonant morphonemes, or by the recognition of {i} and {y} (and {i} and {y}) as distinct functional units. The latter solution is the more economical and, unlike the former, makes it possible to satisfy Condition 4. It is therefore to be preferred.

The Consonants.

The use of the features consonantal vs. non-consonantal and vocalic vs. non-vocalic to define the class of consonants in CLU requires no comment. The feature compact vs. diffuse, which is the acoustic correlate of the back-front opposition, and the feature grave vs. acute, which is the correlate of the opposition between peripheral and medial point of articulation, are also used in conformity with the definitions in Fundamentals. They divide the consonants into four groups, the labials, the dentals,

60 Pp. 29, 31; and Fant, pp. 217-219
the palatals, and the velars, which will be discussed below in that order.

Of the remaining features that function distinctively in the consonants, those which are relevant only to one or two of the four groups - the features strident vs. mellow, nasal vs. non-nasal, and sharped vs. plain - will be discussed in the respective sections below (3.11 and 3.21). In the same connection a few remarks will be made on the use of the feature continuous vs. interrupted. In the present section, only the feature tense vs. lax, which is distinctive for all consonants except {m}, {n}, {ŋ}, will be commented on.

3.010. Ukrainian is generally described as having a distinctive feature of voicing. At the same time, however, it is well known that most varieties of Ukrainian, including CLU, differ from the majority of other Slavic languages by the distribution of this feature. While in other Slavic languages only voiceless obstruents are tolerated in word final position, CLU here preserves the distinction between voiced and voiceless consonants. While in other Slavic languages obstruent clusters follow the rules "voiceless before voiceless" and "voiced before voiced", only the latter rule is generally valid in CLU (with the notable exception that voiceless obstruents are admitted before {v}; cf. rules P 1 and 2a).
The solution adopted here has, to this writer's knowledge, been considered before only by Shevelov. In "Phonema Errans" (p. 418), Shevelov expresses his view that in CLU voicing is distinctive, and not the feature tense vs. lax, but admits the possibility of a development in the direction of the latter feature. In this connection he refers to Troubetzkoy's discussion of these features. 61

3.011. In the passage in question, Troubetzkoy considers the cases in which a distinctive function is fulfilled by several secondary manner features in combination. This is clearly the case in CLU, where the voiced obstruents always are lax, and the voiceless obstruents always tense. In such cases it may be possible to determine which of the features is phonologically relevant, and which redundant, if the opposition is neutralizable. For in the position of neutralization, as a rule, the unmarked member of the correlation represents the archiphoneme. 62

As mentioned above, the opposition between the feature complexes voiced-lax vs. voiceless-tense is

61 Principes, p. 167; Shevelov refers to Grundzüge, p. 141.
62 Cf. also Principes, p. 84.
neutralized in position before a voiced-lax obstruent other than \{v\}. In this position only voiced-lax obstruents are admitted. Since the feature whose unmarked term appears in the position of neutralization is the feature tense vs. lax, this feature must be deemed distinctive.

The analytic technique just outlined, and the principles on which it is based, seem so valuable that they should not be abandoned except — to quote Troubetzkoy —

... là où le système phonologique en question contient des indications directes sur une autre répartition 'non naturelle' du caractère marqué et du caractère non marqué des termes de l'opposition. ... 63

In declining to accept the conclusion reached above, Shevelev makes no mention of any evidence that the feature voiced vs. voiceless should function distinctively in CLU despite its "irregular" distribution. This writer knows of no such "direct indications." 64

3.012. On the contrary, it has repeatedly been observed that in many varieties of Ukrainian, in the position before a voiceless-tense obstruent, the opposition of voiceless-tense and voiced-lax obstruents is reduced to

63 Principes, p. 167.

64 It is clear that the dialects in the extreme West in which the distribution of voicing follows the general Slavic pattern must be left out of consideration here. In these dialects, voicing is evidently distinctive. Cf. Zilikiński, p. 120.
an opposition of voiceless-tense and voiceless-lax obstruents. This is an unmistakeable sign that the feature ofvoicing is merely accessory.

Another striking indication that the feature tense vs. lax must be considered distinctive is provided by CLU \{h\}, the lax counterpart of \{x\}. \{h\} is traditionally defined as voiced, but outside the eastern dialects where voicing usually accompanies laxness it is hardly realized as voiced with any degree of consistency, except in a careful, "maximum redundancy" style. In a relaxed style, there is probably only one position in which \{h\} is consistently voiced by all speakers, viz the position before another lax (and voiced) obstruent. This is the position in which the opposition \{h\}:\{x\} is neutralized. In all other positions, \{h\} may be voiced or voiceless, but it is always distinct from \{x\} by its relative lack of friction, i.e. by its smaller amount of energy. 66 On this basis it is clearly


66 Cf. Broch (Slavische Phonetik, p. 80) on voiced and voiceless \[h\]: "... eine feste Abgrenzung der einen Form von der anderen ist nicht durchgeführt. ..." This
impossible to consider voicing an invariant characteristic of \( \{h\} \).

It is evident from the preceding remarks that the conclusion reached above on the basis of distributional considerations finds support in the phonetic data of the language. It may be argued that, since the orthoepic norms of CLU do not sanction the devoicing of lax obstruents, but stipulate a complete distributional congruence of the features of voicing and tension, CLU could be described equally well if voicing were considered distinctive. This is obviously true. However, since the solution adopted here accommodates several varieties of Ukrainian without any loss of accuracy of description with regard to CLU, it is to be preferred.

3.02. The distinctive feature tense vs. lax is defined as "... higher (vs. lower) total amount of energy in conjunction with a greater (vs. smaller) spread of energy in the spectrum and in time."\(^67\) According to Fant, the greater length of tense consonants may be more

\(^{67}\) _Fundamentals_, p. 30.
important, from an acoustic point of view, than their greater noisiness. Auditorily, however, the latter property seems to be the more prominent. Needless to say, the redundant feature of voicing may be an important cue for the tenseness-laxness opposition.

3.03. In his article "Phonema Errans", as mentioned above (Sec. 3.010), Shevelov admits the possibility of a development in the direction of the feature tense vs. lax. This admission seems to involve two assumptions, neither of which is acceptable.

3.031. The first assumption, which Shevelov shares with all other investigators known to this writer, is that Ukrainian hitherto has had a distinctive feature of voicing. This assumption is not well founded.

With regard to present day Ukrainian the rôle of the feature of voicing has been outlined in the preceding pages. It was seen there that voicing cannot be considered distinctive.

With regard to earlier forms of the language the following can be said. It is generally supposed that Common Slavic had a distinctive feature of voicing. It is

68 Fant, p. 224 f.
further supposed that this distinctive feature of voicing persisted in all the Slavic languages, undergoing no changes except the distributional ones produced by the fall of the jers. In Ukrainian no distributional changes are attested except the elimination of the opposition between "voiced" and "voiceless" obstruents in position before a "voiced" obstruent.

It must not be forgotten, however, that the only evidence for a distinctive feature of voicing in Common Slavic is comparative: voicing is presumed to have been distinctive in Common Slavic because it is assumed to be distinctive in all modern Slavic languages. Acknowledging that C1U has a distinctive feature of tension, rather than voicing, means the introduction of new comparative evidence, which must prompt a revision of the history of the Slavic obstruents.

Shevelov's second assumption is that Ukrainian at present is going through a development which may lead to the establishment of the distinctive feature of tension. Shevelov's statement is not very explicit, but presumably it is the spreading phenomenon of voiceless lax obstruents (cf. Sec. 3.012, n. 65) he has in mind. This assumption

69 A. Meillet, Le slave commun, Paris, Champion, 1924, p.22.
seems to be based on an incorrect interpretation of the data.

Aside from the Ukrainian dialects in which voicing is distinctive (cf. Sec. 3.011, n. 64), Ukrainian dialects treat the feature of voicing in two typical ways. In one part of the dialects (predominantly in the East, and including CLU), lax obstruents (with the possible exception of /h/) are fairly consistently voiced. In the other part of the dialects (predominantly in the West, but also sporadically in the East), lax obstruents are consistently voiced in voiced contexts, but tend to be voiceless before voiceless obstruents. In both groups there is only one "position of neutralization", viz before a lax-voiced obstruent.

There appear to be no reasons for assuming any structural difference between these two groups with regard to the obstruents. They differ only in the distribution of the redundant feature of voicing. One might say that the dialects that admit voiceless lax obstruents merely carry the consequences of the structural facts one step further and eliminate the redundancy of voicing wherever it is convenient. While it is clear that a development in this direction is taking place, it is equally clear that this development is not bringing about any reorganization of the phonological system.70
Regarding the history of the distinctive feature of tension, the following hypothesis can be tentatively formulated.

3.032. Before the fall of the jers two series of obstruents were opposed. The members of one series were voiced and lax, those of the other were voiceless and tense.71 Their relation answered Troubetzkoy's description:

\[\ldots \text{la où plusieurs principes de différenciation sont combinés entre eux et} \ldots \text{ou la nature de la neutralisation de l'opposition ne donne aucune indication sur le caractère marqué ou non marqué des termes de l'opposition, l'exacte détermination de la nature d'une corrélation de mode de franchissement du second degré est à proprement parler impossible.}\]

For in obstruent clusters all members were voiced/lax or voiceless/tense, while no obstruents were admitted in final position.73

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70 Such a reorganization is possibly taking place in those south-western dialects where voiceless/lax obstruents tend to become tense. This development, which is replacing the distinctive feature of tension with that of voicing, cannot be what Shevelov had in mind. It is geographically strictly limited, and is, as yet, irrelevant for the greater part of the Ukrainian dialects including CLU. Cf. Ziliński, p. 121 f. In this connection it is to be regretted that all the work on Ukrainian dialectology has been based on the assumption that voicing, and not tension, was distinctive in the obstruents. One cannot read Ziliński without feeling that many valuable generalizations have been omitted because no structural importance was attached to the feature of tension.

Before the fall of the jers and the appearance of word final obstruents as well as heterogeneous obstruent clusters, the opposition voiced/lax vs. voiceless/tense had been interpreted differently in different Slavic dialects. In some dialects this opposition had been interpreted as one of voicing. These dialects subjected the new obstruent clusters to the rule "voiced before voiced and voiceless before voiceless" and tolerated only voiceless obstruents in final position. In other Slavic dialects, the opposition voiced/lax vs. voiceless/tense had been interpreted as one of tension. These dialects developed the phonological rule "lax before lax". Some complemented this rule with the rule "tense before tense". Characteristic of all these dialects was the persistence of the tense vs. lax opposition in word final position: the "voicelessness" of a following pause has no influence on distinctively tense or lax obstruents.

It is impossible to attempt an exact delimitation of these two groups of Slavic dialects. That must be the subject of a separate study. But it seems clear that, for

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72 Principes, p. 167 ff.
73 Meillet, p. 16
74 Cf. Zížyński, p. 121.
instance, Polish and the Russian dialects on which Standard Russian is based, developed distinctive voicing. Whereas the South Russian dialects and Ukrainian (with the exception of the dialects in the extreme West) belong to the second group.

In the following discussions of the CLU obstruents, an attempt will be made to interpret some of the characteristic traits of Ukrainian in the light of this hypothesis. It will be seen that it goes a long way towards giving a rational explanation to some of the "phonemata errantia" of Ukrainian.

The Labial Consonants

3.1. The non-distinctive sharpening of labials before \([i]\) and the distinctive sharpening of labials before \([a]\), \([u]\), \([o]\), reflecting a morphonemic sequence of labial followed by \(\{j\}\), have already been discussed above (respectively Secs. 2.211 and 1.322). In the present section only two problems will be discussed: the feature composition of the labial consonants, and the status of two of them, \(\{f\}\) and \(\{v\}\).

3.11. The feature composition of the labial consonants which is suggested in Chapter II-A is not maximally
economical. The five segments are differentiated by thirteen feature statements, while the practical minimum is twelve statements. A more economical statement could be achieved by adopting a solution analogous to the one proposed by Morris Halle for Russian:

\[
\begin{array}{ccccc}
\{b\} & \{p\} & \{m\} & \{v\} & \{f\} \\
\text{Strident} & - & - & - & + & + \\
\text{Nasal} & - & - & + & 0 & 0 \\
\text{Tense} & - & + & 0 & - & + \\
\end{array}
\]

The fact that CLU \{v\} is consistently represented by a non-fricative [w] after a vowel when not followed by a non-vocalic segment, however, does not recommend this solution. The solution adopted here seems more realistic, and it was decided to forgo the more elegant statement presented above.

3.121. The vocabulary of CLU includes a considerable, and increasing, number of items containing the sound [f]. Only a few of these words are of native origin, some of the latter being onomatopoeic or having a more or less marked regional flavour (e.g. \texttt{f'jakaty} 'hiss', or \texttt{flin'katy} 'sob'). The vast majority of these words are loan words, drawn partly from Western European languages, partly from the stock of international words of Greco-Latin origin.

Many of the Ukrainian dialects do not have a phoneme
In his description of "General Ukrainian" ("język og.-ukr."), Karol Dejna asserts that "Nie jest fonemem f". In view of what was said above, Dejna's position is undoubtedly defensible. In a description of CLU, however, it seems more realistic to grant that the language has a morphoneme \{f\} and then note its limited occurrence. That is the solution adopted here.

3.122. While there is no doubt that \{v\} is part of the phonological system of CLU, it seems natural to question its position within the system. The definition decided on in the present paper does not, mutatis mutandis, differ from those given /v/ in other descriptions of CLU. Nevertheless, \{v\} deserves a few words of comment.

The fact that friction is not an essential attribute of any of the allophones of \{v\}, and in particular the existence of the allophone [w], suggest the possibility of interpreting \{v\} as the grave counterpart of the acute \{j\}. The great phonetic latitude of \{v\} itself ([w] after vowel

75 Cf. Ziliński, p. 57.
76 Dejna, p. 149.
when no non-vocalic segment follows; [y] before [i], [v] and [ɛ] in free variation elsewhere) seems to indicate a less strictly circumscribed place in the system for this morpheme. (Cf. Troubetzkoy, *Principes*, p. 74 ff.)

If {v} is interpreted as a glide, *{w}, the close affinity of this glide with *{j}, which is suggested by the facts described above, seems to be confirmed by the distributional data. In position after a consonant, *{w} and *{j} are in complementary distribution: after labial consonants, *{w} is not admitted, and after non-labial consonants, *{j} is not admitted.

At the same time, however, such an interpretation creates a number of difficulties. If *{w} and *{j} constitute the class of glides, the distributional characteristics of this class are identical with those of the class of consonants, for {v} has none of the distributional characteristics that set {j} apart from the rest of the segments. As a consequence, this interpretation makes impossible all the morpheme structure rules specifying the features consonantal vs. non-consonantal and vocalic vs non-vocalic in segments contiguous to glides. Since, also, all statements which in this description and the morphological rules it presupposes refer to grave diffuse consonants would be complicated appreciably if this interpretation were accepted
({v} patterns with the labials; cf. rules P 5a, 8a and 9c; and the grammatical alternations {v}~{vj}~{vl}), it should not be.

While the partial complementation of *{w} and *{j} described above would be expressed in a morpheme structure rule assigning the feature grave vs. acute to any glide in position after a consonant, the partial complementation of {v} and {j} is only partially reflected in the morpheme structure rules of the present description. The non-occurrence of {j} after consonants other than labials results in the formulation of rule MS 12b. But the non-occurrence of {v} after {b}, {p}, {f}, {m} is not reflected in a morpheme structure rule. For a few further remarks, see Chapter IV, Secs. 2.2 and 3.2.

3.13. While {f} thus is included among the CLU morphonemes, it cannot be ignored that its status is rather different from that of, for instance, the corresponding Russian morphonemes. It is clear that, unlike its Russian correspondents, CLU {f} is the consequence of heavy borrowing during the last century or so. The earlier inability of Ukrainian to accept loanwords containing [f] without modification, as compared with the apparent ease with which Russian has assimilated a steady trickle of such words during the last several centuries, demands a
structural explanation.

Roman Jakobson discusses the borrowing of foreign phonemes in his "Principes de phonologie historique", where he makes the following general statement:

Les phonèmes étrangers que la langue s'approprie le plus aisément sont ceux qui s'incorporent dans les corrélations déjà existantes.78

This statement should apply to the borrowing of /f/ equally well from the point of view of Russian and from the point of view of Ukrainian, for in both languages {v} was an "unpaired" participant in a correlation embracing all the obstruents. It is plain, however, that Jakobson's statement does not explain the different treatment of [f] in the two languages.

If the hypothesis outlined above (Sec. 3.032) is accepted, the different treatment of [f] in Russian and Ukrainian correlates with the different status of {v} in the two languages. In early Russian, where, after the fall of the jers, {v}, {y} were marked unpaired participants in the correlation of voicing, foreign [f], [ɸ] were identical with the realizations of {v}, {y} in positions of neutralization, and their phonologization provided {v}, {y} with unmarked counterparts. In Early Ukrainian, {v}, {y} were unpaired participants in the correlation of tension.

78 Troubetzkoy, Principes, Appendice I, p. 323.
Since they were unmarked, they could be realized as lax in all positions, as is their modern correspondent, CLU {v}.

In his discussion of dephonologization in the article quoted above, Jakobson mentions that

Il est caractéristique que, dans la suppression des corrélations, ce soit d'ordinaire justement le terme corrélatif marqué qui est supprimé". . . . 79

The different treatment of foreign [f] by Russian and Ukrainian suggests that this statement is true "with opposite signs" with reference to the extension of a correlation. An existing correlation is most easily extended to embrace a new phoneme when the latter is unmarked. Cf. the discussion of foreign [ʒ] below (Sec. 3.23).

With reference to the borrowing of words containing [f] Jakobson makes the following statement:

Dans les cas où existe une tendance à russifier complètement le mot emprunté ayant un f, ce f a été remplacé par xv, x, ou p.80

The replacement of foreign [f] with {p} or {kv}, more often with {x} or {xv}, which is typical of various historical and geographical varieties of Ukrainian, demands a structural investigation. It would appear that, whereas the rendering of foreign [f] as [p] or [x] is equally

possible whether the [f] is heard as voiceless or tense, the heterogeneous clusters [kv] and [xv] indicate the [f] is perceived as tense (the deficiency of the lax [v] is eked out with a tense grave obstruent). A study of the times and places at which such replacements have been or are, made may provide important clues to an understanding of the geographical and temporal distribution of the distinctive feature tense vs. lax, and may, at the same time, throw light on the chronology of other phenomena in the history of the Slavic languages.

A further remark on the status of {v} from a historical point of view is made in Sec. 3.43.

The Dental Consonants

3.2. The dental consonants have already been commented on several times in the preceding sections. Geminate dentals were dealt with in Sec. 1.313. The section on vowels discussed the distribution of sharped and plain dentals before {i}, {i} (secs. 2.211, 2.221). Their distribution before {y}, {y}, {é}, {e} was touched upon in Sec. 2.211 and will be discussed in Chapter III-B, Sec. 4. The distribution of the feature sharp vs. plain in sequences of consonantal segments is most conveniently discussed in connection with the phonological rules in Chapter V. In the present section, only two points will be commented on,
the feature composition of the dental consonants, and the status of the dental affricates.

3.21. The specification of the dental consonants in terms of distinctive features presents no problems. The feature strident vs. mellow naturally divides the dentals into two groups. In the non-strident dentals, the feature nasal vs. non-nasal distinguishes \{n\}, \{r\} from the mellow stops, whereas, in the strident dentals, the feature continuous vs. interrupted separates the dental fricatives from the corresponding affricates. The three features just mentioned are used in the present description in conformity with the definitions in Fundamentals (p. 30 f.) and require no further comment. The feature sharp vs. plain, which is distinctive for all dentals and, among the consonants, is distinctive only for the dentals, also requires no further comment. (Cf. Fundamentals, p. 31)

3.22. The dental consonants present no particular problems of analysis. None of the earlier descriptions of CLU known to this writer differs from the present description with respect to either the number or, mutatis mutandis, the definitions of these consonants. The presence, in CLU, of a full series of non-continuous strident dental consonants makes a lengthy discussion of the analytic procedures required to determine their monophonematicity
seem idle. Suffice it, in passing, to point out that a reasonably efficient formulation of the phonological rules requires that the affricates be considered strident (which precludes their interpretation as sequences of mellow stop followed by continuant) as well as monophonematic. As examples of rules that would be complicated considerably if the affricates were considered sequences, rules P 4a, 4b, 8b, 9c, 9d, 9f may be mentioned. The solution adopted here agrees well with the phonetic facts: affricates are produced with a one-stage release (rather than the release plus friction characteristic of clusters of stop followed by homorganic fricative), and their length does not perceptibly exceed that of single segments. At the same time, this solution facilitates the simplest possible statements of the grammatical alternations in the morphological rules (cf. the parallelism in, for instance, \{k\}~\{č\}, \{t\}~\{č\}, \{č\}~\{č\}; \{d\}~\{ʒ\}, \{ʒ\}~\{ʒ\}).

3.23. Of the four dental affricates, \{č\} has by far the greatest functional yield. It occurs in a considerable number of native Ukrainian roots, as well as in some productive suffixes (e.g. \{#č\}, \{yč\}). \{č\} \{ʒ\}, and \{ʒ\}, on the other hand, might be considered marginal. Their dictionary frequency is relatively low, and an appreciable portion of the roots in which they occur is of non-Ukrainian
origin. In this connection it must not be forgotten, however, that their existence has a good deal of systemic support.

The status of \{\text{3}\} and \{\text{ʒ}\} has been questioned by Shevelov, first only cursorily in "Phonema Errans" (p. 417 f.), later in a separate study, "A latent phoneme in making: The affricate ʒ in Slavic." \(81\) His views require a few words of comment.

In "Phonema Errans" Shevelov limits himself to a few observations on the opposition \{\text{ʒ}\}:{\text{z}} in Ukrainian. He notes, firstly, that in some dialects of Ukrainian, the initial sequence [zv] has been consistently dissimilated to [ʒv], whereas in other dialects (as in CLU), an opposition between initial [zv] and [ʒv] is maintained (cf. CLU \{zvίr\} 'ravine' : \{ʒvín\} 'bell'). Secondly, he asserts that "... in certain words ʒ - z are used indiscriminately (zygary - zygary 'the clock'), and in other words they are retained merely by tradition (3erkalo 'the mirror', 3yga 'the top'). ..."(p. 418). He draws the conclusion that \{ʒ\} and \{z\} are "... in a state of oscillation."

If this conclusion means that the distribution of

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\{/z\} and \{\j\} in related morphemes varies somewhat from dialect to dialect, it is undoubtedly correct. But it fails to be of any significance with respect to the status of the opposition \{z\}:\{j\} in any one variety of Ukrainian.\textsuperscript{82}

In "A latent phoneme in making" Shevelov partly reaffirms the hypothesis that Polish influences are responsible for the appearance of \{z\} in Ukrainian in the sixteenth century (p. 266), partly proposes the new hypothesis that Ukrainian contacts with a Roumanian speaking "shepherd stratum" in the Carpathians led to the introduction of \{o\} somewhat earlier (p. 269 ff.). He establishes that \{j\} was used in the native vocabulary of Ukrainian as early as 1596 (p. 263) and lists some sixty root words containing \{j\} (p. 260 ff). "The list is certainly not exhaustive." (p. 263, n. 30). In addition he mentions that \{j\} filled a gap in the phonological system, where \{z\} lacked a "voiced" partner (pp. 266, 274). From these premises Shevelov draws the non sequitur that \{j\} is

"... almost ... a phoneme, but not a real phoneme." (p. 275).\textsuperscript{83}

\textsuperscript{82} Shevelov's view (reflected also in the quotation in Sec. 1.311, n. 16) that certain phonemic distinctions are part of the phonological system while others are retained "merely by tradition" is unacceptable to this writer. It seems difficult to imagine how any phonemic distinctions could be retained except by tradition.
Despite its somewhat illogical argumentation and its complete disregard for the synchronic facts on the basis of which alone it is possible to establish whether a given sound type is, or isn't, a phoneme, Shevelov's "A latent phoneme in making" contains much valuable material.

In connection with the discussion of the possible Polish influences on Ukrainian at the time of the emergence of \{\tilde{3}\}, Shevelov states that

1. \tilde{3} spread very quickly to the easternmost regions of the Ukraine where no major Pol. influence was exerted /dzveno - 1665, Poltava, dzvon - 1670, Resettylivka/, and 2. encompassed there and everywhere words and categories of words never affected by the change [of \textit{z} to \tilde{3}] in Pol. /e.g. dzykhar 1695, Poltava [\textit{z}]/. . . ."84

Shevelov's doubts that the appearance of \{\tilde{3}\} in the Eastern Ukraine was due to Polish influences seem entirely reasonable. It could similarly be doubted that the Roumanian speaking population in the Carpathians can have exerted any "major direct" influence in that part of the Ukraine. Whatever were the external factors that helped bring about the emergence of \{\tilde{3}\}, it seems obvious that strong internal

83 Shevelov's historical criteria for determining whether a given phoneme is "a real phoneme" are these, it would seem: its existence must be attributable either to "... rise by flood of foreign words borrowed from a given foreign language." (p. 275)

forces were at work at the same time. Otherwise the spread of \( \text{\`c} \) in the Eastern Ukraine would not have been possible.

With regard to a potential internal force, Shevelov repeatedly refers to the empty slots in the series of strident dentals, where only the continuous segments formed a complete set. He also mentions the Ukrainian "... tendency to have fully symmetrical oppositions in voicing ..." (p. 266). If the hypothesis outlined in Sec. 3.032 is accepted, a more compelling internal force can be seen. \( \{\varsigma\} \), which was unpaired and marked, was an element of instability in the system. The introduction of \([\text{\`c}]\) or \([\text{\`z}]\) in positions other than where the tense vs. lax opposition was neutralized sufficed to eliminate the imbalance. This was achieved in various ways. The change of \([z]\) to \([\text{\`z}]\) in initial position before \([v]\), for instance, made \([\text{\`z}]\) a positional variant of both \(\{z\}\) and \(\{\varsigma\}\), and would tend to dissociate \([\text{\`z}]\) from either.\(^85\) On the other hand the borrowing of foreign words containing \([\text{\`z}]\), and the introduction of \([\text{\`z}]\) in foreign words not containing this sound, would lead to the same result.

With regard to the "... tendency to have fully

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\(^85\) Thus, through a distributional constraint on \(\{z\}\), a new morphoneme would be established at the expense of the functional yield of the feature continuant vs. interrupted (cf. R. Jakobson, "Principes de phonologie historique," p. 327 f.)
symmetrical oppositions in voicing. . . " it is interesting to compare the different ways in which the foreign sounds \{f\} and \{3\} were treated in Ukrainian. Neither of these sounds arose as a consequence of "a normal and general sound law." Both of them filled empty slots in the phonological system. But, while \{f\} could be established only after "a flood of foreign words," \{3\} was preserved in early loans, appeared in a number of native words, and has been retained in the phonological system of Ukrainian for several centuries despite its relatively low dictionary frequency. This difference cannot be accounted for by the tendency towards symmetry. It may, however, be accounted for by the principle proposed in Sec. 3.13 to explain the different treatment of foreign \[f\] in Russian and Ukrainian.

The lack of regularity in the change of \[z\] to \[3\] in the native vocabulary of Ukrainian suggests a development that was begun and halted. A structural investigation into the conditioning factors of this development, with a properly balanced emphasis on both internal and external motive forces, is of the highest relevance for an understanding of the history of Ukrainian. The possible existence of similar developments in the history of other Slavic languages makes such an investigation relevant to the history of the Slavic languages in general.
The Palatal Consonants

3.3. The palatal consonants have already been touched upon in preceding sections. The non-distinctive sharping of palatals before {j} was mentioned in Sec. 2.211. The two different reflexes of morphonemic sequences of palatal followed by {j}, the sharped geminates and the distinctively sharped palatals, were discussed in Sec. 1.321. The automatic alternations involving palatal and dental consonants are most conveniently discussed in connection with the phonological rules P 3a, 4a, and 4b in Chapter V, Sec. 1.2.

3.31. The palatal consonants present only one possible problem of analysis, the question of the status of {ź}. According to Shevelov, {ź}, like {ż}, is in "a state of oscillation."86 With regard to CLU, however, the status of {ź} is clear. It occurs in only a very small number of roots, some of them of native, some of them of foreign origin. In addition, it is in regular grammatical alternation with {ś} in one of the productive verb classes (full stems ending in {y}).87 It is thus - to borrow a phrase

86 "Phonema Errans," p. 417
87 Shevelov's view that the status of {ź} is unstable is possibly based on the fact that the alternation {ś}→{ź} has been eliminated in the conjugation of verbs in {y} in some Ukrainian dialects (predominantly in the Sloboda and Steppe Regions). In these dialects, forms like /xośǔ kručū vožǔ nośǔ/ correspond to CLU /xožǔ kručū vožǔ nošų/ (cf. Żylko,
from Stankiewicz - ". . . stable in the system, but rare in contexts."88

The question of the origin of Ukrainian \{ź\} has been the subject of a great deal of discussion.89 Essentially, the problem is whether the Ukrainian alternation \{ź\}~\{ź\} is the product of a relatively recent analogy with \{č\}~\{č\}, or has been preserved in the language since [dj] first changed to [ź] in Early East Slavic. In the former case, the early change of [ź] to [ż] can be assumed to have been general, in the latter it must have left unaffected those [ź] that alternated with [d] in Ukrainian alone.

This is not the place to add to the debate on this dilemma. But it should be noted that the hypothesis outlined in Sec. 3.032 may be of some relevance to the solution. If this hypothesis is accepted, the history of [ź] can be

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described in maximally simple terms, viz in terms of two general and well motivated developments. The first development changed both [ʒ] (from [dʒ]) and [ʒ] (from [g]) to the homorganic fricatives, thus precluding the establishment of a series of affricates marked for voice (cf. the quotation from R. Jakobson, "Principes de phonologie historique," Sec. 3.13, n. 79). The second development introduced [ʒ], [ʒ], and [ʒ] in those East Slavic dialects that had evolved a distinctive feature of tension, and provided the unpaired, marked affricates with the unmarked counterparts necessary for the stability of the system.

The Velar Consonants.

3.4. The non-distinctive sharpening of the velar consonants before {i} was mentioned in Sec. 2.211. Aside from the automatic distribution of the feature tense vs. lax in obstruent clusters (rules P 1 and 2a), the velars are involved in only one automatic alternation, viz their replacement by the corresponding palatal consonants before {j}.

This alternation, which might have been mentioned in Sec. 1.321, but was left unconsidered for the sake of simplicity, is described in rule P 2c. Examples can be found in the corresponding section of Chapter V.

3.41. In his "Fonologiczny system języka ukraiński" Karol Dejna states that "... nie jest fonemem
According to Shevelov, "the sound g . . . has stood till this day on the borderline between the system of Ukrainian consonants and consonants outside this system." **90**

{g}, then, requires a few words of comment.

{g} is limited to a relatively small number of native roots and assimilated loans. Formerly, {g} furthermore rendered foreign [g] in the Western Ukraine, where Polish influence was strong. In the east, however, where Russian influence prevailed, foreign [g] in bookish loans was usually rendered by {h} (Ukrainian h equals Russian g). In an attempt to standardize the written language, the letter g was abolished in 1946. As a consequence, {h} is replacing {g}, not only in words that formerly varied regionally, but also in words that formerly were pronounced with [g] everywhere. **91**

The future of {g} in the URSR is uncertain. It is interesting to note Zylko's view that

Dejakyj zanepad fonemy g až nijak ne svidčyt', sľô neju treba nextuvaty v literaturnij movi. Fonema g

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**90** "Phonema Errans," p. 417

In any case, the possibility cannot be ignored that the same structural forces that have maintained \{g\} in Ukrainian for the last several centuries despite its marginality will continue to support its existence.

3.42. The introduction of \{g\} in early Ukrainian is best accounted for as part of a development which provided all the unpaired marked obstruents with unmarked counterparts. In this connection it is worth noting the example dzykhar quoted above (Sec. 3.23, n. 84) with the digraph kh for the new \[g\].

The earlier development, which changed \[g\] via \[j\*\], to \[h\], has to this writer's knowledge not received a structural explanation. The "popular" explanation offered by André Martinet, that \[g\] is more difficult to articulate than any other voiced stop, is not very enlightening.\(^93\)

It fails to account for the preservation of \[g\] in other Slavic dialects. In *Slavic Languages*, Roman Jakobson calls this change a "local innovation in part of the final Proto-

\(^92\) Loc. cit.

\(^93\) "Rôle de la corrélation dans la phonologie diachronique," *TCLP*, VIII, 1939, p. 281, and n. 3.
slavic period," notes its complementary distribution with the coalescence of [ć] and [ć] in the East Slavic dialect group, but offers no clarification of the connection between these developments. He mentions that the change of [g] to [g] (and on to [h]) is common to the entire central Slavic area (Czech, Slovak, High Sorbian, and part of Slovenian in addition to Ukrainian, Belorussian, and South Great-Russian).

If the hypothesis sketched in Sec. 3.032 is accepted, the different treatment of [g] in the different Slavic languages receives a natural explanation, it would seem. In those Slavic languages which at the time of the fall of the jers had distinctive voice, /g/ came to be in constant automatic alternation with /k/ in positions of neutralization. Phonologically, /g/ was "/k/ plus voice," and phonetically


95 Op. citi, p. 15. N. S. Troubetzkoy's article "Die Entwicklung der Gutturale in den slavischen Sprachen," Sbornik v čest' na prof. L. Miletič, Sofija, 1933, pp. 267-279, unfortunately could not be consulted. According to Shevelov ("A latent phoneme in making," p. 252) Troubetzkoy considered the spirantization of [g] general " . . . where this was not precluded by the merger of [ć] with [ć] (North Russian; Lower Sorbian), or by the tendency to eliminate [k] (Mac., Southern Polish, parts of SCR. and Bulg.)."
[g] was "[k] plus voice." While there was no motivation for a change affecting /g/ in these languages, the unpaired /x/ has in some of them been curtailed or eliminated. Conversely, in those of the Slavic languages which had developed the distinctive feature tense vs. lax by the time of the fall of the jers, /g/ was the only lax velar consonant. As such, it was not of necessity distinctively interrupted. In the positions of neutralization, /x/ was realized as [g], and /x/ as [g], but there was no need for /g/ to be identified with one of them rather than the other. There was thus nothing in the phonological structure of these languages to prevent a change of [g] to [g] (and on to [h]).

The change of [g] to [g] still need not be explained as due to the difficulty inherent in articulating voiced interrupted [g]. The "weakening" of voiced-lax stops to the homorganic continuants is a common phenomenon in languages with distinctive tension. That only {g} changed, while {ð} and {ð} remained intact is natural enough: {ð} and {ð} were both distinctively interrupted.

It is clear that the present day geographical distribution of the feature tense vs. lax does not correlate with the area in which [g] changed to [g] (and on to [h]). It is necessary to assume that the tenseness feature in large parts of the Slavic language area has been replaced by distinctive voicing. The fact that in some Slavic
languages the development of [g] to [h] ran its full course before voicing superseded the tenseness feature (as, for instance, in Czech), while in others voicing was introduced at the [g] stage (as in the South Great-Russian dialect group), suggests the possibility of establishing the relative chronology of these developments.

3.43. The early division of the East Slavic language area into a northern dialect group, characterized by the preservation of interrupted [g] and the coalescence of [č] and [c], and a southern dialect group, characterized by the change of [g] to [g] and the consistent differentiation of [č] and [c], was mentioned above. This writer knows of no attempts to explain why the isoglosses of these two important features largely coincide.

As was seen in the preceding few paragraphs, the assumption that the southern group of dialects had a distinctive feature of tension can account for the change of [g] to [g]. It seems natural to ask, whether the same assumption can account for the preservation of the [č], [č] distinction.

At the time in question, the two dialect groups had the following inventory of unpaired phonemes:
The unpaired phonemes can be assumed to have been elements of instability in both systems, and were, then, "... exposés à disparaître, à se créer un partenaire corrélatif..."

It is evident that the latter solution was adopted in both dialect groups for the marked phonemes, while the former was applied to the unmarked phonemes. The tendency to reduce the number of unpaired phonemes would naturally affect the affricates first. Where /c/ and /ç/ were unmarked, a reduction in their number could only be achieved through a sound change, and in the northern group they coalesced. This development did not spread to the southern group, for there the problem was different.

From the fact that the South Great-Russian dialect group preserved the distinction between /c/ and /ç/, it is clear that the tendency to fuse /c/ and /ç/ had run its course by the time these dialects developed distinctive voicing.

Where /c/ and /ç/ remained marked, the possibility existed of stabilizing them by the introduction of unmarked...
counterparts. This possibility, of course, also existed with regard to /k/, which in Ukrainian succeeded /x/ as the unpaired velar consonant, just as it existed in North Great-Russian with regard to /v y/. This possibility was realized in both dialect groups.

The Liquids

In Secs. 1.3133, 1.3134, and 1.323 the different treatments of {i} and {r} followed by {j} were discussed. It was mentioned in Secs. 2.211 and 2.22 that in the varieties of CLU that distinguish weak and strong paired consonantal segments, {r} is weak whereas {i} is strong. In addition, it was stated in Figure III that {r} is the only paired consonantal segment that does not occur in word final position (cf. rule P 8f).

4.1. The liquids present no analytical problems. It was noted in Sec. 2.32 and 2.33 that some earlier descriptions of Ukrainian have considered [r] and [r] positional or free variants. This is entirely realistic with regard to a great many regional dialects of Ukrainian, but it is characteristic of CLU that the sharped and plain interrupted liquids are distinguished before {a}, {u}, {o} and are in

complementary distribution (and not free variation) elsewhere. Furthermore, the distribution of \{r\} and \{ț\} before \{ă\}, \{õ\}, \{î\} is in CLU etymologically correct. In this respect, the literary language differs from a number of regional dialects which do maintain the opposition of \{r\} and \{ț\}, but in which the historical distribution of the two morphonemes has been disturbed.

The Distinctive Features

The distinctive features as they relate to individual morphonemes and morphoneme classes have been discussed above. Here only two points will be mentioned, the place of the tonality features in the hierarchy of distinctive features, and the degree of economy achieved in the branching diagram (Figure I).

5.1. It is evident from the branching diagram, and from the distinctive feature matrix (Figure II), that the features flat vs. natural and sharp vs. plain are in complementary distribution in the CLU morphonemes. The feature flat vs. natural is distinctive only for the vowels, while the feature of sharping is distinctive only for consonants and liquids.

Flatting and sharping are, as the names of these features suggest, opposite phenomena. Acoustically, flatting consists in a downward shift of some of the components
of the spectrum, whereas sharping means an upward shift of some of the components of the spectrum. Articulatorily, the former feature is effected through a narrowing of one of the orifices of the mouth resonator, in CLU, the front orifice, while the latter results from a widening of the back orifice, the "pharyngeal pass."\(^{99}\) (Fundamentals, p. 31 f.)

The possibility of considering the two features manifestations of a single invariant feature, which might be termed "modified tonality," cannot be ignored. In Preliminaries (p. 33 f.) it is suggested that "if there is only one tonality feature in the vowels of a given language, then it may be lumped with the primary (or only) tonality feature of the consonants. . . ." This suggestion, however, is not relevant to CLU, for here two tonality features are distinctive for the vowels, and the feature sharp vs. plain cannot be considered the primary tonality feature of the consonants. For the present description, therefore, it was decided to forgo this reduction in the number of distinctive features.

It is worth noting that if the two features flat vs. natural and sharp vs. plain were collapsed into a feature of "modified tonality," this feature would rank differently in different parts of the hierarchy of features. In the vowels, it would hold a higher place than the feature grave
vs. acute, but the latter feature would precede it in the consonants and liquids. This is the type of situation envisaged by Morris Halle in *Sound Pattern*, p. 35 f. The distributional variants of the feature "modified tonality" would be predictable from the feature consonantal vs. non-consonantal: "modified tonality" means flattening in non-consonantal segments, and sharpening in consonantal segments.

5.2. The forty-four CLU morphonemes are fully specified by means of 277 feature statements (branches in Figure I, pluses and minuses in Figure II), that is, by an average of 6.3 statements per segment. This compares favourably with the theoretical lower limit of 5.46 (= \(\log_2 44\)) statements. That a greater measure of economy can be achieved in the specification of the CLU morphonemes than in the description of the Russian segments is not surprising. The relatively low average number of statements per segment reflects the relatively high degree of symmetry apparent in the branching diagram (Figure I).

B. THE BOUNDARIES

The five phonological boundaries of CLU, which are listed in Chapter II-A, have been postulated in conformity with Condition 1. They are introduced in the description to account for certain limitations on the sequential constraints. In other words, their function is to delimit the domains within which the phonological rules hold.

The rules which eliminate morpheme boundaries or convert them into phonological boundaries are part of the transformational level and cannot be included in the phonology of the language. Since, furthermore, none of the transformational rules of CLU have been given a definitive formulation, the remarks in the following sections will be limited to a characterization of the contexts in which the phonological boundaries are found and a brief mention of some of their effects.

Not surprisingly, the close relationship of CLU and Russian is reflected in the existence of similar phonological boundaries in the two languages. As will be seen below, the contexts in which the CLU boundaries are postulated are largely identical with those of the corresponding Russian boundaries. Naturally, the effects

100 Cf. Sound Pattern, pp. 48-50.
of the boundaries differ from one language to the other.

1. The phrase boundary ([l]) is introduced in the following places: 1. At the beginning and end of sentences, and 2. before and after the longest immediate constituent containing not more than two and not less than one accented vowel.

The phonological phrase is the domain in which the rules describing the distribution of the feature tense vs. lax hold (cf. rules P 1 and 2a). The rules describing the distribution of the feature compact vs. diffuse in sequences of acute obstruents, and of the feature sharped vs. plain in sequences of acute diffuse consonants, are obligatory only within the phonological word. They may, however, apply to the phonological phrase in allegro speech (cf. rules P 3a, 4a, 4b; and P 9a). Finally, the rules of prominence hold within the phonological phrase (cf. rules P 15 and 16).

2. Word boundaries ([2]) are introduced in the following places: 1. before and after unaccented proclitics, enclitics, conjunctions; and adverbs; 2. after the morpheme class symbol &imperative&; 3. at all phrase boundaries; and 4. before and after the longest immediate constituent containing a single accented vowel.

It is interesting to note the parallelism between Russian and CLU with regard to the word boundary postulated
after the imperative desinence. In CLU, sequences of
sharped and plain acute diffuse consonants are not admitted
within word boundaries (cf. rule P 9a). Since rule P 9a
clearly has no effect on items like [láz'te] 'crawl',
[vý'ste] 'hang', [trá'ťte] 'spend', (2.pl.impr.), these words
must be analysed as {láz'2'e}, {výs'2'e}, {tráť'2'e}. 101

As mentioned in the preceding section, rule P 9a may be ex­tended to cover a phonological phrase in a casual style.
Under such circumstances, the imperatives mentioned above
may be pronounced [láz'te], [vý'ste], [tráť:e].

3. The prefix boundary ([3]) is postulated after
prefixes and unaccented prepositions.

The prefix boundary is important for the description
of the distribution of the feature sharped vs. plain in
certain sequences of consonantal segments (cf. rules P 9a, 9c, and 9d). It also accounts for the occurrences of
plain strident acute diffuse consonants before {i} (cf. rule P 8c. Furthermore, the prefix boundary prevents the
sharpening of certain acute diffuse consonants before {j}
(rule P 5b), as well as their gemination in the same con­text (rule P 6).

101 Cf. Roman Jakobson, "Russian Conjugation," Word, IV
(1948), p. 159.
As mentioned in Chapter III-A, Sec. 2.211, the general rule that acute diffuse consonants and continuous liquids are plain before \{y\} and \{e\} has certain "exceptions." Apart from the forms of the verb \{i\} 'pour' which are taken care of by rule P 8g, these "exceptions" are accounted for by the suffix boundary (\{4\}).

The suffix boundary is introduced before adjectival desinences beginning with \{y\} and \{e\}. Thus, the distinction between, for example, \{blahódn\{4\}e\} 'noble' and \{horódp\{4\}e\} 'horticultural' (nom.sg.neut.) is maintained in [blahóródne] and [horódpne] (cf. rule P 8b). It can be noted that, since all adjective stems ending in a sharped morphoneme are accented, there is no need to introduce the suffix boundary before desinences beginning with \{ý\} and \{é\}.

The compound boundary (\{5\}) is introduced in compound abbreviations of the type \{part\{5\}z\{3\}bory\} 'party meeting'. In abbreviations of this type sequences of tense and lax obstruents which are otherwise not admitted within word boundaries can occur (cf. rule P 2a).
The present chapter offers some comments on the morpheme structure rules of CLU. In Secs. 1. and 2., whose numbering parallels that of Chapter II-B, the material on which the individual morpheme structure rules are based is surveyed and discussed. Sec. 3. contains some incidental observations on some problems connected with the formulation of these rules.

1.1. Rules MS 1 to 3 are based on the following attested morpheme initial cluster types:

RC \{'stúť\} 'mercury' CCJ \{'svjáť\} 'holiday'
CJ \{'piáť\} 'five' CCR \{'zhraj\} 'crowd'
CR \{'xlib\} 'bread' CCC \{'šdić\} 'stink'
CC \{'svít\} 'world'

Two longer word initial clusters are attested. One, the CCCR of \{'pštr-úh\} 'trout', contains a zero alternating with a vowel on the derivational level (\{'p#štr\}, cf. \{'pěštr-ýj\} 'variegated'). The other, that of the river name Strv'jaž (a tributary of the Dniester rising in Poland), does not occur in an indisputably Ukrainian morpheme and can safely be discounted.

It was mentioned in the discussion of the multiple
realizations of \{j\} (Chapter III-A, Sec. 1.322) that the distinctly sharpened labial consonants can be analysed as morphonemic sequences of labial followed by \{j\}. They occur only in the context C...V, where sequences of labial followed by [j] are not attested. While the adoption of this analysis has quite attractive consequences for the formulation of the morphological rules, it alone makes it necessary to take morpheme initial sequences of the type CCJ into account. While this may seem slightly less than ideal, it seems to be adequately compensated for by the existence of rule MS 12b. Partly as a consequence of the latter, the five-segment morpheme \{svját\} does not require more feature statements in the dictionary representation than does the four-segment morpheme \{svát\} 'match-maker'. Compare

\[
\begin{array}{ccc}
\{Sv j á t\} & \{Sv a t\} \\
\text{Consonantal} & ++--o+ & +--+ \\
\text{Vocalic} & --o-- & --+- \\
\text{Compact} & -oo+ & --+ \\
\text{Flat} & 000-0 & 00-0 \\
\text{Grave} & -00+- & --++ \\
\text{Strident} & +000- & +00- \\
\text{Nasal} & 000-0 & 00-0 \\
\text{Continuous} & +0000 & +000 \\
\text{Tense} & ++000 & ++00 \\
\text{Sharped} & 00000 & 0000 \\
\text{Accented} & 00000 & 0000 \\
\end{array}
\]

After the morpheme structure rules and the morphological rules have been applied, the words \{svját\} 'holiday' (gen. pl.) and \{svát\} 'match-maker' (nom. sg.) are by the phono-
logical rules turned into [švát] and [svát] (rules P 5a, 7, and 9c apply to the former, rule P 5a to the latter).

1.2. Rules MS 5 to 7 are based on the following corpus of morpheme final cluster types:

<table>
<thead>
<tr>
<th>CJ</th>
<th>{tímj} 'crown of head'</th>
<th>RC</th>
<th>{čėry} 'worm'</th>
</tr>
</thead>
<tbody>
<tr>
<td>JR</td>
<td>{vô jl} 'sluggard'</td>
<td>CC</td>
<td>{mîst} 'bridge'</td>
</tr>
<tr>
<td>RR</td>
<td>{hîřl} 'estuary'</td>
<td>JCC</td>
<td>{obišt} 'farm yard'</td>
</tr>
<tr>
<td>CR</td>
<td>{xytř} 'sly'</td>
<td>RCC</td>
<td>{bôšč} 'beet soup'</td>
</tr>
<tr>
<td>CCR</td>
<td>{hošť} 'sharp'</td>
<td>CCC</td>
<td>{tóvšt} 'fat'</td>
</tr>
<tr>
<td>JC</td>
<td>{øjv} 'quince'</td>
<td>RCCC</td>
<td>{čêsťvy} 'stale'</td>
</tr>
</tbody>
</table>

In a few words of patently non-Ukrainian origin, a final sequence RCR is attested, as, for instance, in the word fil'tr 'filter'. Since words of this type deviate in structure from the native vocabulary of CLU, there is little point in taking them into account in the formulation of morpheme structure rules. A few remarks on the consequences of the inclusion or exclusion of foreign words for the morpheme structure rules are presented below (Sec. 3.1).

1.3. Rules MS 9 to 11 are based on the following attested medial cluster types:

<table>
<thead>
<tr>
<th>JR</th>
<th>{bajrâk} 'ravine'</th>
<th>RJ</th>
<th>{burjân} 'weeds'</th>
</tr>
</thead>
<tbody>
<tr>
<td>JC</td>
<td>{bûjvIl} 'buffalo'</td>
<td>RR</td>
<td>{bařlîh} 'lair'</td>
</tr>
</tbody>
</table>
Medial cluster types other than those listed above are attested in a few clearly non-Ukrainian items. Thus, for instance, RCC in halstux 'necktie', burštyn 'amber'; COCC in havptvaxta 'main guard', mundštyk 'bit'; CCCR in menstruacija 'menstruation', abstrahuvaty 'to abstract'. They can safely be disregarded as atypical.

2.1. Rule MS 12a describes the non-occurrence of clusters consisting of velar followed by velar or velar followed by palatal consonant.

The rule is exactly analogous to Morris Halle's rule MS 11c for Russian.¹ The similarity between the two rules extends even to the existence in CLU of a single counter-example which may raise doubts as to whether the rule is justified. CLU {lókš} 'noodles', unlike Russian {vék-š+a} 'squirrel', cannot be considered a morpheme sequence. It is, however, of non-Ukrainian origin (Kazan Tatar, Uygurian lakča).² It is unknown to this writer how


² Cf. M. Vasmer, Russisches etymologisches Wörterbuch, Heidelberg, Chr. Winter, 1953. It is interesting to note that the Russian correspondent is lapša.
long, the morpheme has been in Ukrainian (Russian лапша is attested in Domostroj, according to Vasmer) and uncertain to what extent it might be considered "naturalized." For a few further remarks on {людь}, see Sec. 3.1.

2.2. Since among the consonants only the labials can precede {j}, there is no need to specify a consonant followed by {j} as diffuse and grave in the dictionary. The relevance of rule MS 12b for morpheme initial sequences of the type CCJ was mentioned in Sec. 1.1. In addition, this rule was referred to in connection with the discussion of the place of {v} in the phonological system (Chapter III-A, Sec. 3.122).

If {v} were to be reinterpreted as a glide, {*w}, opposed to {*j} as grave to acute, the feature grave vs. acute would be predictable in the glides in position after a consonant. It would be possible to formulate two morpheme structure rules, one specifying {*j} as acute following a grave diffuse consonant, the other specifying {*w} as grave following a compact or acute diffuse consonant. Each of these rules, then, would predict one feature statement in a context defined by means of six or (in the case of a compact consonant) five feature statements, as illustrated in the following partial feature matrix,
where the first rule would replace the last zero with a minus.

While the decision to treat \{v\} as a labial consonant, as mentioned in Chapter III-A, Sec. 3.122, facilitates a considerably more efficient formulation of the rules MS 1 to 10, it clearly leads to a loss of predictability in sequences of consonant followed by \{v\}. On the other hand, however, it increases the predictability in sequences of consonant followed by \{j\}. While the rule exemplified above predicts one feature statement in a context defined by means of six, rule MS 12b predicts two in a context defined by only four.

One additional consequence of rule MS 12b must be mentioned. In the discussion of the multiple realizations of \{j\}, it was shown that the vast majority of sharped geminates should be analysed as morphonemic sequences of a consonantal segment followed by \{j\} (Chapter III-A, Secs. 1.3133 and 1.321). It was also mentioned (Secs. 1.3122 and 1.312, n. 23) that sharped geminates may occur within single morphemes. Rule MS 12b presupposes that no sharped geminate consonants have been analysed as monomorphemic sequences of consonant followed by \{j\}.
In the corpus examined for the present description, this is relevant to only one item, *suddja* 'judge'. This word has tentatively been analysed as containing a morpheme \( \{\text{sud}^3\#j\} \). The "mobile vowel" is not attested, but postulated in analogy with words like *stattja* 'article'. The latter word contains a morpheme \( \{\text{stat}^5\#j\} \). Its gen.pl. is \( \{\text{stat}^5^j\#j^v\} \) (parallel to \( \{\text{sud}^j\#j^v\} \)) or \( \{\text{stat}^e^\#j^e\} \). If this analysis should turn out to be undesirable, there still exist the possibilities of considering the stem of *suddja* a single morpheme with a final morphonemal gemination, and of considering it a morpheme sequence.

2.3. The circumstances that lead to the formulation of rule MS 12c were stated in Chapter III-A, Sec. 2.211 and further discussed in Sec. 2.2213 of the same chapter. No additional comments seem necessary here.

2.4. The only sequences of liquids attested are those consisting of an interrupted liquid followed by a continuous liquid. In view of this, there is no need to specify the feature continuous vs. interrupted in sequences of liquids. The feature can be assigned by a rule, viz rule MS 12d.

3.1. Since there is hardly a linguistic structure which is not heterogeneous in some respects, it is impera-
tive that a distinction be made between the typical and the atypical when descriptive statements are formulated. In the preceding sections it was repeatedly noted that part of the material attested was disregarded in the formulation of the morpheme structure rules. The exclusion of patently foreign elements from the material on which the morpheme structure rules are based is a necessary consequence of Condition 5, for their inclusion would mean a marked decrease in the economy with which the native morphemes can be represented. (For example, if the final cluster type RCR, discussed in Sec. 1.2, is included in the description, the efficiency of rule MS 5c is halved; if the one morpheme \{loiks\} is to be taken into account, the considerable economy expressed in rule MS 12a must be relinquished.)

The fact that foreign morphemes are left out of consideration in the formulation of certain morpheme structure rules naturally does not mean that they cannot be represented. It merely means that no particular economy can be achieved in their representation. Where the feature vocalic vs. non-vocalic can be left unspecified before a morpheme final sequence CR in native morphemes (cf. rule MS 5c), this feature must be specified in the morpheme \{filtr\}.

One more remark should be made in this connection. The function of the morpheme structure rules is to assign
values to unspecified non-phonemic features. They are therefore formulated in such a way that they never apply to already specified features. Those non-native morphemes which have been disregarded in the formulation of the morpheme structure rules constitute the only exceptions to this general rule (e.g., rule MS 5c will contradict the already specified feature vocalic vs. non-vocalic in the antepenultimate segment of \{filter\}). Since, however, the morpheme structure rules cannot change the values of already specified features, nothing happens.\(^3\)

\(3.2\). In the formulation of the morpheme structure rules it is naturally necessary to satisfy Condition 5. This can be done in several ways: through the ordering or the wording of the rules, or through the elimination of uneconomical rules.

It was suggested in Sec. 2.2 that the efficiency of a rule can be expressed simply as the ratio of the number of features the rule assigns, to the number of feature statements required to define the context to which the rule applies. The number of features assigned can be called the

\(^3\) This is stated unequivocally in Sound Pattern, p. 56, but appears to be contradicted in the discussion of Russian \{ajv\}, p. 57 f. The statement on p. 58 that rule MS 1a "... turns the second segment ... into a vowel." must be a lapsus calami.
"yield" of the rule; the number of feature statements required to define the context, its "cost; and the ratio of these figures, the "relative cost."

The relative cost of the rules discussed in Sec. 2 is as follows: MS 12a: 6/1; MS 12b: 4/2; MS 12c: 6/1; MS 12d: 4/2. On the average, then, the relative cost of these rules is 3.67.4

The implications of these figures are obvious. In order that a given rule can satisfy Condition 5, there must be a reasonable relationship between its relative cost and the number of morphemes to which it applies.

It seems worth while considering a specific example. In CLU, clusters of labial consonants are not attested in initial position. While an initial labial consonant can be followed by an acute diffuse or an acute compact consonant (e.g. {vdlv} 'widow', {\textsuperscript{6}g\textsuperscript{l}l} 'bee'), a following grave consonant is invariably compact (e.g. {\textsuperscript{5}h\textsuperscript{t}j}'bend'). Furthermore, in morpheme medial and final position, the only clusters of labial consonants attested are those that begin with {m} or {v} (e.g. {kl\textsuperscript{\ensuremath{\text{l}}}mb}'threshing floor', {\textsuperscript{5}c\textsuperscript{o}v\textsuperscript{b}}'rock').

4 The specifications "initial" and "non-initial", which are necessary in the definitions of certain contexts have been assigned the value 1.
These distributional facts invite the formulation of a rule like the following: in position after a grave diffuse consonant other than non-initial {v} or {m}, a grave consonant is compact.\footnote{Cf. the similar rule for Russian, 
\textit{Sound Pattern}, p. 60: "MS 11b. In position after a grave noncompact \textipa{\{labial\}}
consonant other than non-initial \textipa{*m}. a \textipa{[grave - H\#A\#]} consonant is compact."} Such a rule, however, while clearly giving an accurate account of some of the distributional characteristics of labial consonants, would defeat its own purpose, that of introducing a measure of economy in the description. At a relative cost of 15/1, this rule would reduce the number of feature statements by one in only a handful of morphemes.

This writer would like to propose an amendment to Morris Halle's statement that ". . . a feature must remain unspecified in the phonological representation whenever the feature is nonphonemic by virtue of its occurrence in a particular context."\footnote{\textit{Sound Pattern}, p. 30.} In view of Condition 5, it would seem that the function of the morpheme structure rules is not to describe the sequential constraints, but to predict sequences that are admitted. Thus, a feature must be left unspecified in the representation of morphemes only where it is more economically specified by a rule. In order that
a morpheme structure rule can produce a saving in the representation of morphemes, its relative cost must be lower than the number of morphemes to which it applies.

The relative cost of the rules discussed in Sec. 1, MS 1 to 10, is somewhat lower than that of rules MS 12a to 12d:

<table>
<thead>
<tr>
<th>Rule</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS 1a</td>
<td>2/2</td>
</tr>
<tr>
<td>MS 1b</td>
<td>6/2</td>
</tr>
<tr>
<td>MS 1c</td>
<td>3/2</td>
</tr>
<tr>
<td>MS 2</td>
<td>6/2</td>
</tr>
<tr>
<td>MS 3</td>
<td>6/8</td>
</tr>
<tr>
<td>MS 5a</td>
<td>6/2</td>
</tr>
<tr>
<td>MS 5b</td>
<td>3/2</td>
</tr>
<tr>
<td>MS 5c</td>
<td>10/2</td>
</tr>
<tr>
<td>MS 5d</td>
<td>6/2</td>
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<tr>
<td>MS 6</td>
<td>6/2</td>
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<tr>
<td>MS 7</td>
<td>6/14</td>
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<tr>
<td>MS 9a</td>
<td>3/2</td>
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<tr>
<td>MS 9b</td>
<td>3/4</td>
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<tr>
<td>MS 9c</td>
<td>3/4</td>
</tr>
<tr>
<td>MS 10</td>
<td>6/12</td>
</tr>
</tbody>
</table>

The overall average relative cost of these rules is 1.21. The greater efficiency of these rules is naturally conditioned by the fact that they involve only two distinctive features. In addition, however, the fact that the rules are partially ordered contributes considerably to their economy. Thus, after the relatively costly rules MS 1a to 2 have been formulated, a more general rule, MS 3, can be formulated which reduces the average relative cost of the whole set (cf. the similar relationship between MS 5a to 6 and MS 7; and between MS 9a to 9c and MS 10).  

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7 Morris Halle provides a good example of the importance of ordering the rules properly in Sound Pattern, p. 58 f. Rules MS 1a to 3, which are maximally economical, have an overall relative cost of 26/19 (= 1.37); rules MS 9a to
Considerations of the relation between relative cost and actual number of morphemes concerned are relevant to rules MS 1a to 10 as well as to rules MS 12a to 12d. In particular, it might be asked whether rules MS 9a to 10, which are applicable only to morphemes with three or more vowels, increase the number of unspecified features in sufficiently many morphemes to justify their relative cost. In view of the low overall relative cost of these four rules, (15/22 = .68), this question can undoubtedly be answered positively.
CHAPTER V

COMMENTS ON THE PHONOLOGICAL RULES

The present chapter offers some comments on the phonological rules. Its primary purpose is to illustrate the operation of these rules. In this connection, some remarks will be made on the order in which the rules must be applied. In addition, a number of rules which are alternative to rules listed in Chapter II-C, or which are not mandatory, will be discussed. The first two sections have been numbered to parallel the sections of Chapter II-C. The alternative and optional rules are given in Sec. 3 below.

1.1. Rules P 1 and 2a describe the automatic distribution of the feature tense vs. lax in obstruent clusters.

Examples of rule P 1. \{dxnúv\} [txnuw] 'took (masc.) a breath' (cf. \{vy\]3\dxnúv\} [vydxnuw] 'exhaled' (masc.)); \{vy\]3\jšov\]2\z\]3\xáty\} [výjšowsxáty] 'came (masc.) out of the house', but fem. \{vy\]3\jšla\]2\z\]3\xáty\} [výjšlazxáty].

It should be noted that the exception to the general statement in rule P 1 cannot be formulated rigorously. There appears to be a great deal of variation with regard
to the preposition and prefix \{z\}.\footnote{Cf., for instance, M. A. Žovtobrjux, Sučasna ukrajins'ka literaturna mova, Kyjiv, Radjans'ka Škola, 1961, p. 106.}

Examples of rule P 2a. \{próšba\} [próšba] 'request' (cf. \{próšať\} [próšať] 'they ask'); \{xripže\} [xripže] 'but he snored' (cf. \{xroplá\} [xroplá] 'she snored'). But across a compound boundary there is no neutralization: \{partdcyplína\} [partdscyplína] 'party discipline'.

The persistence of the distinction between tense and lax obstruents outside the positions defined in rules P 1 and 2a is abundantly exemplified in the following sections. In addition, compare: \{lís\} [lis] 'forest' and \{liz\} [liz] 'crawled' (masc.); \{říška\} [říška] 'crumb' and \{řízka\} [řízka] 'stick'; \{tvír\} [tyir] 'creation' and \{dvír\} [dyir] 'door'.

1.2. Rules P 3a, 4a, and 4b describe the distribution of the feature compact vs. diffuse in clusters of acute obstruents. Rules P 2b, 2c, and 3b are prerequisite for the proper operation of the above rules and require a few words of comment.

Rule P 2b assigns the non-phonemic feature inter-
rupted to the dental stops. This must be done before rule P 3a is applied since this rule turns some dental stops into palatal affricates, which are distinctively interrupted.

Rule P 2c, which is parallel to the rules discussed in Sec. 1.3, must be placed before rule P 3a since the latter may apply to the palatal consonants resulting from the application of rule P 2c. In the material analysed for the present description, there are no examples of dental obstruents preceding velars affected by rule P 2c. It is, however, not unlikely that a larger corpus would contain such examples.

Rule P 3b assigns the non-phonemic feature of stridency to the palatal consonants in order to ensure that all acute diffuse obstruents resulting from the application of rule P 4a are strident.

Examples of rule P 3a. Dental stops before palatal consonants: {brátčyk} [bráč:yk] 'little brother', {tčút} [č:uť] 'they weave'; {nadžály} [nažály] 'began reaping' (pl.); {vidčepyv} [vičepyv] 'detached' (masc.).

Strident dentals before palatal consonants: {pisčányj} [piščányj] 'sandy'; {zšyla} 'sewed' (fem.) (cf. rule P 1); {bezšumu} [bežšumu] 'noiselessly'; {zžerelá} [žžerelá] 'from the source'; {xlopéž} [xlopéž]
'but the boy' (cf. rules P 2a, 8e, and 10a).

Examples of rule P 4a. \{pɔ\}³[kaźša] [pokąša] 'show yourself'; \{u\}³[plašči] [uplašči] 'in the bottle' (cf. \{plaška\} [plaška] (nom.sg.) and rules P 8c and 9a; \{dočį\} [doč:i] 'daughter' (dat.sg.) (cf. \{dočkà\} [dočká] (nom.sg.) and rules P 8c, 9a, and 11a).

Examples of rule P 4b. \{u\}³[budči] [ubudči] 'in the booth' (cf. \{budka\} [budka] (nom.sg.) and rules P 8c and 9a); \{pecätči\} [pečatči] 'stamp' (dat.sg.) (cf. rules P 8a, 9a, and 11a).

As was mentioned in Chapter IV (Sec. 1), these rules are obligatory within the phonological word, but may, in a casual style, apply also across word boundaries within a phrase provided no pause intervenes.²

1.3. Rules P 5a to 5d and 8a to 9e describe the automatic distribution of the feature sharped vs. plain in consonantal segments. The division of these rules into two groups is necessitated by the rules that generate the multiple realizations of \{j\}. For example, rule P 9c presupposes that

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the feature sharped vs. plain has been assigned to all labial consonants. Rule P 8a, however, must be limited to specifying these consonants as plain before consonants and liquids, and in word final position. It could not be applied to labials in other positions without interfering with the reflexes of sequences of labial followed by {j}. Thus, the distribution of the feature sharped vs. plain in labial consonants followed by a vowel or {j} must be specified by a rule preceding rule P 7, viz rule P 5a.

Examples of rules 5a to 5d which involve {j} are given below in connection with rules P 6 and 7.

Examples of rule P 5a. Labial consonants before a vowel: {bík} [bi:k] 'side' (nom.sg.) and gen.sg. {bóku} [bóku]; {býk} [byk] 'bull'; {búk} [buk] 'beech'.

Examples of rule P 5c. Palatal consonants before a vowel: {bőjíl} [bőjíl] 'bees' (gen.pl.) (cf. rule P 2a), but nom.sg. {bőjolá} [bőjolá]; {šíst} [štíst] 'six' (cf. rule P 9a), but {šéštero} [šéštero] 'a group of six' (cf. rules P 8b and 9a); {křyčít} [kryčít] 'cry' (2.pl.impr.), but {křyčýt} [kryčýt] '(one) cries' (cf. rule P 8f).

Examples of rules P 5a and 7. {žvýazk} [žyazk] 'clang' (cf. rule P 9c), but {žvžá} [žvža] 'connection' (cf. {vža} [vža] 'clasp'); {mertiňá} [mertyák]
'corpse', but \{čerťák\} [čerťák] 'worm'.

Examples of rules P 5b, 6, and 7. \{pid\}\{3\}\{boríćja\} [pidboříčːa] 'chin' (cf. rules P 5a, 5d, and 11a), but gen.
pl. \{pid\}\{3\}\{boríj\}, to which rule P 6 does not apply, becomes [pidboříː]; similarly \{pro\}\{3\}\{válja\} [proválːa] 'precipice', but gen.pl. \{pro\}\{3\}\{válj\}, [provál]. Rules P 5b and 6 have no effect across the prefix boundary. Thus, for instance, \{z\}\{3\}\{jiːdːt\} 'they will eat' becomes [zjiːdːt] rather than the non-standard [zːiːdːt].

Examples of rules P 5c, 6, and 7. \{roz\}\{3\}\{doríːha\} [rozdoříːːa] 'fork of a road' (cf. rules P 2c, 5d, and 11a); gen.pl. \{roz\}\{3\}\{doríːj\}, to which rule P 6 does not apply, becomes [rozdoříː] (cf. rule P 8e).

Examples of rules P 5d and 7. \{poyitrja\} [poyítːra] 'air' (cf. rules P 5a and 9b), but \{bez\}\{3\}\{víːra\} [bezýːːra] 'atheism' (cf. \{víra\} [víːra] 'faith') and \{su\}\{3\}\{zǐːra\} [sužíːra] 'constellation' (cf. \{zorá\} [zorá] 'star', and rule P 8c).

Rule P 8a complements rule P 5a by specifying labial consonants as plain in all positions not mentioned in the latter rule.

Examples of rule P 8b. Mellow acute diffuse consonants: \{kőnyk\} [kőnyk] 'little horse', \{kősːeːj\} [kőːʃːeːj]'horses'

Examples of rule P 8c. {sík} [šik] 'chopped' (masc.), {sík} [šik] 'juice' (cf. gen.sg. {sóku} [sóku]), {šil} [šil] 'villages' (gen.pl.) (cf. nom.pl. {géla} [séla]); but across the prefix boundary, rule P 8c has no effect, cf. {zi[3]hnán[4]yj} [zihnányj] 'rounded up' and {zí[3]}

3 Cf. Synjavs'kyj, p. 60.
Examples of rule P 8d. \{kíp\} [kip] 'horse' (cf. gen.sg. \{košá\} [košá]), but \{kyu\} [kyu] 'throw' (sg.impr.). Rule P 8d complements rule P 2c by specifying all velar consonants not affected by the latter rule.

Examples of rule P 8e. Rule P 8e specifies the so far unspecified palatal consonants as plain before consonants (e.g. \{̕mi̱\} [̕mi̱] 'drone'), before liquids (e.g. \{člen\} [člen] 'member'), and in word final position (e.g. \{píč\} [píč] 'oven'). The rule changes the sharped palatals in word final position which result from the application of rules P 5c and 7. Thus, for instance, \{roz̕3doríňj\} 'fork of a road' (gen.pl.), which after P 2c is \{roz̕3dorížj\}, after 5a and 5d, \{roz̕3dorížj\}, after 7, \{roz̕3doríž\}, is by 8e turned into \{roz̕3doríž\} (ultimately [rozdoříž]). Similarly, \{pid̕3zámkj\} 'vicinity of a castle' (gen.pl), which after P 7 is \{píž̕3zámč\}, after P 8e is \{píž̕3zámč\} (ultimately [pížzámoč]).


ignorovan[yj] [zignoróvanyj] 'ignored'.

Examples of rule P 9a. {kíšt} [kišt] 'bone', and gen.pl. {koštéj} [kostéj]; {títk} [títk] 'aunt', {títcí} [tíč:í] (dat.sg.) (cf. rules P 4b, 8c, and 11a); {trvyóžsa} [tryvóžsa] 'be frightened' (impr.); {píš} [píșa] 'song' (cf. gen.pl. {píse} [píse]), and in.sg. {píšý} [písheju] [písneju] (cf. rule P 8b); {sónc} [sónc] 'sun' (cf. gen.pl. {sónc} [sónc]) and gen.sg. {sónc} [sónc]. In a deliberate style, rule P 9a does not hold across a prefix boundary: {štín} [štín] 'walls', but {z[3]tín} [štín:] 'with shade' (cf. rules P 1, 5b, 6, 7, and 11a); or across a word boundary: {bánty} [banty] 'tassels', but {sta[4]te} [stánte] 'stand' (2.pl.impr.). But a casual style may extend the domain of the rule to the phonological phrase, neutralizing the oppositions: [štín], [štín::]; [bánty], [stánte:]. Note that this rule must follow rules P 8b and 8c (cf. the forms of {tít#k} and {sónc} above).
Examples of rule P 9b. {kozlá} [kozlá] 'billy-goat' (gen.sg.) (cf. nom.sg. {kozél} [kozél]), like {vuzlá} [vuzlá] 'knot' (gen.sg.) (cf. nom.sg. {vúzol} [vúzol]); {vítru} [vítru] 'wind' (gen.sg.), {viťrív} [viťríw] (gen. pl.) (cf. nom.sg. {víťer} [víťer]).

Examples of rule P 9c. Sharped and plain dental consonants are opposed before plain labials: {pýšmo} [pýšmo] 'letter' (cf. gen.pl. {pýšem} [pýšem]), and {pásmo} [pásmo] 'skein' (cf. gen.pl. {pásom} [pásom]); but the opposition is neutralized before sharped labials: cf. loc.sg. {pýšmi} [pýšmi] and {pásmí} [pásmí]. Cf. further {žvír} [žyir] 'animals' (collective) (gen.sg. {žvíru} [žyíru]) and {zvír} [žyir] 'ravine' (gen.sg. {zvóru} [zvoru]). Across a prefix boundary, rule P 9c does not apply: {špíly} [spíly] 'ripened' (pl.), but {ží[píš]l} [spíl] 'from the fields'. For some speakers, rule P 9c might be extended to include the continuant grave compact consonants in the same position: cf. {xmíl} [xmíl] 'hops', gen.sg. {xmélu} [xmélu]; the pronunciation [xmíl], however, may be as common.

Examples of rule P 9d. {kozlí} [kozlí] 'billy-goat' (loc.sg.) (cf. nom.sg. {kozél} [kozél]) and {vuzlí} [vužlá] 'knot' (loc.sg.) (cf. nom.sg. {vúzol} [vúzol]). Rule P 9d has no effect across a prefix boundary in a careful style:
cf. {zloži} [zloži] 'from the loge' and {glózy} [glózy] 'tears' (pl.).

Examples of rule P 9e. {hólci} [hólci] 'needle' (dat.sg.) (cf. nom.sg. {hólka} [hólka] and gen.pl. {holók} [holók]; {vólzi} [vólzi] 'the Volga' (dat.sg.) (cf. nom.sg. {vólha} [vólha]); contrast {hálka} [hálka] 'jackdaw', loc. sg. {hálci} [hálci] and {hálka} [hálka] (proper name), loc.sg. {hálci} [hálci].

1.4. Examples of rule P 9f. {smijéťsa} '(one) laughs' and {smijúťsa} 'they laugh', which after rules 4b, 5a, and 9c are {smijéčsa} and {smijúčsa}, become {smijéčča} and {smijúčča}, ultimately [smijéčːa], [smijúčːa]. The rule may be effective across a word boundary where there is no pause: {tráťsa} [tráčːa] 'be spent' (sg.impr.), {némučsa} [nemúčːa] 'do not tire yourself' (cf. rule P 4a).

Rule P 9g assigns the non-phonemic features sharped and acute to {j}. {j} must be specified as sharped for the proper operation of the rules that assign allophonic features to the vowels (P 11c to 14), and it must become acute before the glide allophones of {v} are generated by rule P 10c.
Examples of rule P 10a. \{jákišt\[4\]yj\} [jákišnyj] 'qualitative' (cf. \{jákišt\} [jákišť] 'quality'); \{pó[3]jizdn\[4\]yj\} [pójiznyj] 'of a train' (cf. \{pó[3]jizd\} [pójizd] 'train'). It can be noted that the rule does not cover the alternation in \{týžden\} [týždeň] 'week', gen.sg. \{týžna\} [týžna], the only example of the elimination of a dental stop after a palatal continuant. The alternation here is not automatic, cf. \{týženno\} 'weekly' (adv.), i.e. \{týžen-n-o\}. It might be mentioned also that rule P 10a can refer simply to "interrupted acute consonants" since there are no sequences of strident dental followed by an acute compact consonant (cf. rule P 3a).

Examples of rule P 10b. This rule applies to the products of rule P 6 which follow a consonant or liquid: \{jid\[3\]gruštja\} 'background', which after P 6, 7, and 9a is \{jid\[3\]gruštta\}, becomes [jidgruštta]; \{směřtu\} 'death' (in.sg.), which after P 6, 7, and 8f is \{směřťtu\}, becomes \{smerťu\}. There are no examples of geminate liquids affected by this rule in the present limited corpus. Rule P 10b generates the distinctively sharped palatales discussed in Chapter III-A, Sec. 1.321: \{jid\[3\]zámkja\}, which after rules P 2c, 5a, 5c, 6, and 7 is \{jid\[3\]zámčča\} becomes [pizzmčča]. Rule P 6 could easily be formulated in such a way that it
would not generate geminates in position after a consonantal segment. Such a reformulation, however, would complicate rule P 6 without leading to the elimination of rule P 10b, which is needed for sequences like {xūstōi} 'kerchief' (loc. sg.) (cf. nom.sg. {xūstka}), where there are no geminates till after rule P 9a (i.e. {xūstōi}, after P 4b: {xūscōi}, after P 8c: {xūscći}, after P 9a: {xūscći}, ultimately [xūscći]).

Postvocalic {v}, when not followed by a vowel, is realized as a glide, [w] (cf. Chapter III-A, Sec. 3.122). The essential difference between [v] and [w] is that the latter is articulated without the labial obstruction that characterizes the former. Acoustically, then, [w] is non-consonantal.\(^4\) The change in the feature composition of postvocalic {v} not followed by a vowel is effected by rule P 10c. It can be noted that [w] is opposed to {j}, which has already been specified as acute by rule P 9g. Examples: {króvy} [króvy] 'blood' (gen.sg.), but nom.sg. {króv} [krow], in.sg. {króvju} [krówju], diminutive {krívlá} [kriwld]. Rule P 10c must precede rule P 11a to ensure the

correct realization of, for instance, the \{vv\} of \{bovván\} [bovván] 'image'.

As was mentioned in the discussion of geminates in Chapter III-A, Secs. 1.311 and 1.312, the CLU geminates are, from an articulatory point of view, sequences of identical segments separated by an intensity valley which reflects the interval between two chest pulses. If only the articulatory mechanism of the oral cavity is considered, the geminates appear to be lengthened. It is this oversimplified analysis which is reflected in the traditional transcription of geminates (where geminate [d] is written [d:]). This transcription can be retained provided it is understood to render the articulatory facts in a simplified manner.

Examples of rule P 11a. \{ob\}[ýťy] [ob:ýty] 'to wallpaper'; \{znajóm-mo\}[jέ4ýx] [znajóm:ojýx] 'let us get them acquainted'; \{pid\}[dáxja] [pid:áš:a] 'loft'; \{z\}[zádu] [z:ádu] 'from behind'; \{z\}[žáty] [ž:áty] 'to mow down'; \{mašýn-n\}[4ýj] [mašýn:yj] 'machine' (adj.); \{vý\}[ssaty] [výš:aty] 'to suck out'; \{míčju\} [míč:u] 'copper' (in.sg.); \{súťju\} [súť:u] 'gist' (in.sg.); \{ťínju\} [ťínt:u] 'shade' (in.sg.); \{míčju\} [míč:u] 'strength' (in.sg.); \{máťju\} [máť:u] 'ointment' (in.sg.); \{mežý\}[říčka] [mežýříč:a] 'region between rivers'; \{pid\}[níhja] [pídníž:a] 'pedestal'; \{pid\}[dáxja]

It should be noted that rule P 11a does not affect sequences of {j} or postvocalic {vv}. Thus, {vij-j-á} 'cart shaft' (cf. {vij-č-é} [yijcé] 'plough shaft') is realized with distinct allophones of {j} for the falling diphthong [ij] and the rising diphthong [ja], [vijá]; similarly, postvocalic {vv} becomes [wv] as a result of rule P 10c, e.g. {zaľ3vľ3váha} [zawváha] 'note'.

1.5. Rules 11b to 14 assign allophonic features to the vowels. Rule P 11b specifies {û} and {ô} as fundamentally back vowels and is prerequisite for rule P 12, which describes the fronting of all grave vowels in position after a sharpened segment. Rules P 12 to 14 can be suspended in a maximum redundancy style, as in the examples contained in the preceding sections, but in a "natural" style they are operative. It should be noted that the considerable vacillation in the realization of vowels in checked positions depending on variations in style, tempo, and individual speech habits makes it undesirable to describe the data more precisely than has been done in rules P 12 to 14.

Examples of rule P 12. {sá́d} [sad] 'garden', but {sá́du} [sá́du] 'I shall sit down'; {lóx} [łox] 'river salmon' but {lóx} [łóx] 'dungeon'; {lúk} [łuk] 'arch', but {lúk} [łūk] 'hatchway' (gen. pl.); {lýsľ́4yj} [łýsyj] 'bald', but
Examples of rule P 13. {vád} [vad] 'defect' (gen. pl.), but {váq} [vaǐq] 'hinder' (sg.impr.); {tón} [ton] 'tone', but {dóq} [doiŋ] 'little daughters' (gen.pl.); {sýn} [syn] 'son', but {sýp} [syǐp] 'blueness'; {núq} [nuq] 'boredom', but {núq} [nuǐq] 'nausea'.

The combined effects of rules P 12 and 13 is a relatively strong fronting, particularly marked in unaccented vowels, in rapid speech also in accented vowels. For instance, {gáq} [gǎq] 'sit down' (sg.impr.); {lóši} [loší] 'sow' (dat.sg.) (cf. {lóxa} [lóxa] (nom.sg.)).

No rules have been formulated to describe the different degrees of diffuseness in accented and unaccented {ŷ} and {ũ} since this variation possibly is not general (cf. Chapter III-A, Sec. 2.11). The opposite phenomenon, however, is described in rule P 14: unaccented {e} and {o} tend to become less compact than their accented counterparts.

Examples of rule P 14. {e}: {mét} [met] 'goal' (gen. pl.), but dat.sg. {meť} [myŤ], gen.sg. {metý} [myŤy], acc.sg. {metů} [myŤu]; nom.sg. {metá} [meťa] or [meťá], in.sg. {metóju} [metoju] or [meťoju]. {o}: {kozá} [kozā]
'goat' (nom.sg.), but {kozi} [ko·zú] (acc.sg.), and {kozi} [ko·zí] (dat.sg.).

2. As mentioned in Chapter I-C, a study of the distribution of relative prominence in unaccented vowels could not be undertaken in the course of the present investigation. For this reason, the rules describing prominence have been limited to the bare essentials.

3.0. It was stated in the Introduction (Chapter I-A) that the differences between the several varieties of CLU essentially are differences in the distribution of phonemes, which are reflected in the existence of supplementary phonological rules. These rules are listed, and their place in the phonological system discussed, in the following.

3.11. It was mentioned in Chapter III-A, Sec. 2.2222 that the present orthoepic norms of Soviet Ukrainian accept the elimination of the opposition /i/:/y/ in word initial position. The following optional rule can be formulated:

In position after a word or prefix boundary, {y} becomes acute.

The place of this rule cannot be determined from the material examined for the present description. But since a prefix final labial consonant presumably will be sharped before an [i] resulting from this rule, the rule can tentatively be placed before rule P 5a and numbered PO 4c.
3.12. In some varieties of CLU, the /i/:/y/ opposition is eliminated after /j/ (cf. Chapter III-A, Sec. 2.2213). For these varieties of CLU, the following optional rule can be formulated:

In position after {j}, {y} becomes acute.

It is important that this rule be applied before rule P 12, and it can therefore be numbered PO 1lc.

3.13. As mentioned in the discussion of sequences of consonantal segment followed by vowel (Chapter III-A, Sec. 2.2212), the division of the paired consonantal morphonemes into strong and weak is not relevant for all varieties of CLU: in some varieties of CLU, the opposition of sharped and plain paired consonantal segments before /i/ has been eliminated. In order that the present description can accommodate these varieties of the language, the following optional rule can be formulated:

Mellow acute diffuse consonants and continuous liquids are sharped before {i}.

To ensure the proper operation of the rules describing the automatic distribution of the feature sharped vs. plain in sequences of consonantal segments (rules P 9a, 9b, 9d, and 9e), this rule must be numbered PO 8h.

3.2. The fact that several varieties of a given language can be described as deviations from a given norm by
the inclusion of optional rules in the phonology of the language is one of the most interesting implications of the theory of phonology chosen as the framework for the present description. Morris Halle has recently suggested that linguistic change can be described as the introduction of new rules into the phonological system. While in the innovating generation a change would be reflected in an optional rule, a later generation would integrate the change in the obligatory rules to achieve a maximally economical phonological system.\(^5\) This suggestion seems to be supported by the situation in CLU.

Thus, for instance, it seems certain that rule P0 8h, which must be an optional rule in a description that accommodates several varieties of the language, is an optional rule for many speakers of CLU, who apply this rule in a colloquial style, but suspend it in formal speech. It seems equally certain that for many speakers of CLU this rule has been completely integrated into the phonology. These speakers have in their speech pattern an alternative rule which incorporates both of rules P 8c and P0 8h and may be numbered PA 8c:

Acute diffuse consonants and continuous liquids are sharpened before {i}.

On the other hand, it would seem that more than the phonological rules can be involved. Thus, it is clear that in the varieties of CLU where rule PO 11c has become rule P 11c, rule MS 12c has become redundant and, most probably, deleted. Again, in the varieties of CLU where rule PO 4c is obligatory, it can be assumed that the opposition of morpheme initial /i/:/y/ has been eliminated in the dictionary representation of lexical morphemes and is preserved only in grammatical morphemes.
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