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Historical Phonology of Russian

by

Gordon H. Fairbanks

CAN COLLEGE
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Poona

1965

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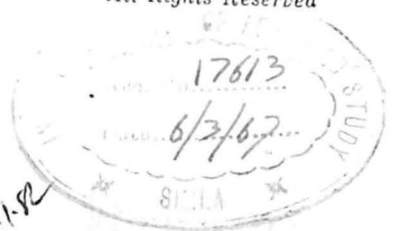

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FOREWORD

On the 15th of October 1964 the Deccan College celebrates the centenary of its main Building, and curiously enough this period coincides with the Silver Jubilee of the Postgraduate and Research Institute which, as successor to the Deccan College, started functioning from 17th August 1939 when members of the teaching faculty reported on duty. When I suggested to members of our faculty the novel idea that the centenary should be celebrated by the publication of a hundred monographs representing the research carried on under the auspicees of the Deccan College in its several departments they readily accepted the suggestion. These contributions are from present and past faculty members and research scholars of the Deccan College, giving a cross-section of the manifold research that it has sponsored during the past twentyfive years. From small beginnings in 1939 the Deccan College has now grown into a well developed and developing Research Institute and become a national centre in so far as Linguistics, Archaeology and Ancient Indian History, and Anthropology and Sociology are concerned. Its international status is attested by the location of the Indian Institute of German Studies (jointly sponsored by Deccan College and the Goethe Institute of Munich), the American Institute of Indian Studies and a branch of the Ecole Francaise d'Extreme-Orient in the campus of the Deccan College. The century of monographs not only symbolises the centenary of the original building and the silver jubilee of the Research Institute, but also the new spirit of critical enquiry and the promise of more to come.

7th March 1964 S. M. KATRE

PREFACE

In a sense this text has been thrust upon me from having occasion to teach a course on the History of the Russian Language. I have taken data from the standard handbooks and have reorganized it in terms of phonemic analysis to make it more comprehensible to students who have been trained in descriptive linguistics. I hope that in the course of this reorganization certain facets of the history of Russian phonology have been made clearer, that some new light, however small, has been introduced to the subject. The history of a language goes back indefinitely in the past. In choosing a starting point I have arbitrarily selected Proto-Indo-European because that makes for an easy transition from Indo-European studies to Russian and vice-versa. It is thus hoped that the book may be useful to the Indo-Europeanist as well as to the Russian specialist.

I owe much to my colleagues at Cornell, Frederick B. AGARD, Charles F. HOCKETT and Richard L. LEED, with whom I have discussed many of the problems which arose during the working out of the text. I owe even more to my students whose stimulus initiated the study in the first place and who have been a constant stimulus toward a more finished product. If such a finished product has not been achieved, the fault is mine. I am grateful to the American Council of Learned Societies for financial assistance in 1953–4 during which time much of the initial studies for this text were made.

April 9, 1964 GORDON H. FAIRBANKS

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LIST OF ABBREVIATIONS

Arm.	Classical Armenian
Av.	Avestan
Bg.	Bulgarian
BR	Byelorussian
Cz.	Czech
EArm.	Modern East Armenian
Eng.	English
Ger.	German
Gk.	Greek
Goth.	Gothic
GR	Great Russian
IE	Indo-European
Lat.	Latin
Lith.	Lithuanian
Mac.	Macedonian
MGR	Middle Great Russian
NGR	North Great Russian
OB	Old Bulgarian or Old Church Slavic
OCz.	Old Czech
OE	Old English
OHG	Old High German
OP	Old Persian
OPol.	Old Polish
OR	Old Russian
PESl.	Proto East Slavic
PGR	Proto Great Russian
PIE	Proto-Indo-European
PIH	Proto-Indo-Hittite
Pol.	Polish
Pr.	Prussian
PR	Proto-Russian
Pre-IE	Pre-Indo-European
Pre-Sl.	Pre-Slavic

PSESl.	Proto South East Slavic
PSl.	Proto Slavic
PSSl.	Proto South Slavic
PWSl.	Proto West Slavic
R	Russian
SCr.	Serbo-Croatian
SGR	South Great Russian
Skt.	Sanskrit
Slov.	Slovenian
Ukr.	Ukrainian

1. INTRODUCTION

1.1 *Purpose*

The following paper is an attempt to show how the phonological system of Russian has developed from Indo-European. Developments are treated in a chronological order insofar as possible and the effects of the individual changes on the phonological system are stated stage by stage. The purpose is to state how the whole phonological system changes by stages rather than to present a long series of disconnected changes without regard for either the chronology or the system. From Proto-Slavic onwards an attempt is made to determine those changes that caused a language to split into separate branches. Thus Proto-Slavic is viewed as splitting into West Slavic and South-East Slavic. The latter splits into South Slavic and East Slavic and then further splits are stated down to modern Russian. A similar attempt is not made to determine the language splits between Indo-European and Proto-Slavic since this is considered more properly a problem of Indo-European linguistics than of Russian linguistics.

1.2 *Language Split*

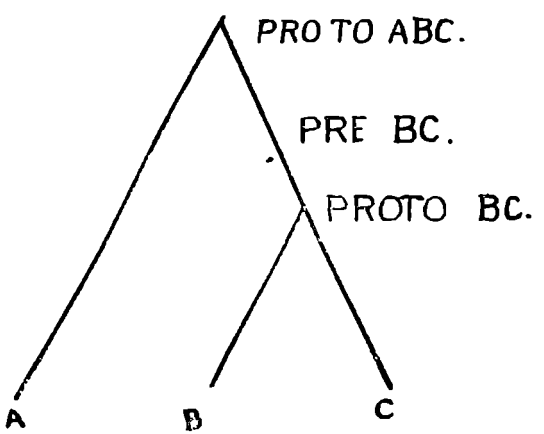
A basic principle underlying this paper is the determination of the point at which a language is considered to have split into two languages. It is assumed that once it can be determined that a phonemic change has taken place in one part of the area in which a language is spoken and not in another part, then the language will be considered to have split into two languages. If a phonetic change takes place that is sub-phonemic this is considered insufficient evidence for a language split. One reason for considering it insufficient is that a phonetic change that is sub-phonemic can very often not be determined at all or can be determined only after another change causes the

first one to become phonemic. Another reason is that even when it can be determined that a sub-phonemic change has taken place it can usually not be dated relative to other changes except within an extremely wide range of time.

In contrast to a sub-phonemic change, a phonemic change is normally determinable and is likely to be datable relative to other changes within very much narrower limits of time. Furthermore a phonemic change is considered sufficient evidence of language split because once a phonemic change has taken place in one part of a language area and not in another part, it is almost impossible for the two languages to undergo any further change that will make them identical. The few cases where it is possible are not relevant to a statement of the past history of a language although they might be relevant to the prediction of the future development of a language. One case is where a phonemic change takes place in area A but not in the rest of that language area, area B, and then subsequently spreads to area B. This is not relevant since it would only be determinable that a single change had taken place affecting the whole area. Another case is the situation where subsequent to a change in area A a change involving the merger of all the pertinent phonemes takes place in the whole area. Here too it would only be possible to determine that a single change had taken place over the whole area. Another case would be where subsequent to one or more changes in area A, the speakers of area B considered the A language to have a sufficient prestige that they borrowed it completely. This would not invalidate the hypothesis, but would mean that the original language was split into two languages, A and B, and then subsequently language B was replaced by language A. It is assumed here then, that a phonemic change taking place in part of a language area and not in the rest of the area is a necessary and sufficient cause to assume that the language has split

into two languages. Clearly the degree of separation between two languages after being separated by a single phonemic change is not great. They would still be mutually intelligible and would be classifiable as two dialects of the same language. The split is nevertheless definitive and the resultant languages will be considered two languages for historical purposes. It is this criterion for language split that is used in determining the splits between Proto-Slavic and Modern Russian.

The terms Proto and Pre are used in a very specific sense. The term Proto is applied only to that stage of a language immediately before a phonemic change takes place affecting part of the language area and causes the language to split into two languages. The term Pre is applied to any stage of a language preceding the Proto stage. This is illustrated by the following diagram.



2. PROTO-INDO-EUROPEAN

2.1 *Phonemes of Proto-Indo-European*

The phonemes assumed for Proto-Indo-European (PIE) and their classification is as follows :

obstruents	*p*	*t*	*k̂*	*k*	*kʷ*
	b	*d*	*ĝ*	*g*	*gʷ*
	bh	*dh*	*ĝh*	*gh*	*gʷh*
sibilant	*s*				
semi-vowels	*l*	*r*	*m*	*n*	*y* *w*
laryngeal	*H*				
vowels	*e*	*a*	*o*	*ə*	
	e:	*a:*	*o:*	*i:*	*u:*

The phonemic system includes a five by three series of stops with three manners of articulation, voiceless unaspirated, voiced and voiced aspirated, and five positions of articulation, labial, dental, palatal, velar and labio-velar. It is assumed that the voiced aspirates were unit phonemes[1]. There was one sibilant, /s/, which had a voiceless allophone, [s], and a voiced allophone, [z]. There were six semi-vowels, each of which consisted of a vocalic allophone, a consonantal allophone and an allophone that was both vocalic and consonantal (cf. #2.4). There were four short vowels, /ə/ being a centralized vowel, and five long vowels. There were several laryngeals (cf. #2.8) which are not distinguished here, but are represented by the cover symbol /H/. The laryngeal was limited in its distribution to position after voiceless stop, after semi-vowel and after the short vowel, /ə/. It may have occurred in other positions, but these are the only ones that are here considered significant for Slavic[2].

The phonemic system assumed here is purposely one that does not differ radically from the traditional ones of

BRUGMANN[3] and MEILLET[4]. It is not the purpose of this treatise to solve problems in Indo-European linguistics and the use of a reasonably traditional interpretation of PIE versus a more radical one will affect only the very early statements of the development from PIE to Proto-Slavic (PSl). Those who prefer a more traditional statement can easily make the necessary changes and those who prefer a more radical statement of PIE can, with not much more difficulty, also make the necessary revisions. Brief statements are given in the rest of this chapter to explain the bases for positing the phonemic system presented above, but for a detailed discussion of the problems of a phonemic statement for PIE the reader is referred to the standard handbooks.

2.2 *Dorsals in PIE*

Not all linguists assume a threefold series of dorsal stops. KURYLOWICZ[5] assumes two phonemes, /k̑/ and /k/, the latter having a velar allophone [k] and a labio-velar allophone [k^{w}]. MEILLET[6] and LEHMANN[7] assume two phonemes, /k/ and /k^{w}/, the former having two allophones, a palatal [k̑] and a velar [k]. LEHMANN assumes that the palatal allophone occurred before /e/ and the velar before /a o r/. That such a statement for PIE is reasonable is shown from the high frequency of this particular distribution reflected in the various descendants of PIE. The problem is whether this indicates that PIE had two dorsal phonemes or whether it indicates that Pre-IE had two dorsal phonemes which had already developed into three by PIE times. LEHMANN assumes that for the satem languages a contrast between the palatal and velar allophones is established when the vowel system is disturbed. The only disturbance in the vowel system that will produce such a contrast is for /e/ to coalesce with either /a/ or /o/ or with both. Such a change occurs in Indo-Iranian, but does not occur in Slavic until very late

(cf. #3.6) and does not occur in Armenian at all. If this thesis could be maintained, then we could posit only two dorsal phonemes for PIE.

LEHMANN also suggests, *PIEP* 101, that there was an alternation between the palatal allophone and the velar allophone of /k/ in verb forms and noun forms where there is an alternation of thematic vowel /e/ and /o/. He says that such a system is likely to remain stable unless the vowel system is disturbed. However, such a system might very well not remain stable, but might be subject to the influence of analogy, that is, the palatal allophone might be generalized in some forms and the velar allophone in others. As soon as analogy has operated, then there would be a contrast between the palatal [k̑] and the velar [k] and we would have to posit three dorsal phonemes. Analogy would have resulted in phonemic change. If it is further assumed that in the satem languages palatalization had taken place sub-phonemically producing :

še /ke/ *ko* /ko/ *ka* /ka/

then it would be even more likely that analogy would operate to produce :

še /še/ *ko* /ko/ *ka* /ka/
šo /šo/ *ke* /ke/

Given a phoneme /k/ with a front allophone before a front vowel and a back allophone before other vowels, there is always a positive probability that the front allophone will be palatalized. The assumption here is that in the satem languages it was palatatized and this made the operation of analogy more likely, whereas in the centum languages the front allophone was not palatalized and analogy did not operate. This assumption agrees with the fact that in the satem languages this was not the only palatalization that took place, but it was followed by at least one other palatalization within what was probably not a very long period. In the centum languages there was

always a positive probability that the front allophone would be palatalized, but it just did not happen to become palatalized until a very much later period and then only in some of the centum languages. This thesis would also imply that PIE had only two dorsal phonemes and that one of the developments that separate the centum from the satem languages is the occurrence of this analogical change. The main difficulty with this thesis is that there is relatively little evidence that it took place. If it had taken place we would expect a fairly large number of examples of a morpheme that indicates a previous [k̑] in some satem language and also the same morpheme indicating a previous [k] in the same or in another satem language. VONDRAK[8] cites a few examples : OB. *lẽgõ* 'I lie down', Pr. *lasint* 'lie'; OB. *mogõ* 'I can', Pr. *massi* 'he can', Skt. *mah-* 'great'. An example of the same morpheme showing variant forms in the same language is Skt. *locana* 'eye' indicating an earlier [k] or [k^{w}], and Skt. *rušant-* 'bright', indicating an earlier [k̑]. There are also some examples that are not to be explained by this type of analogy : OB. *kamy* 'stone', Skt. *aśman* 'thunderbolt'. Considering the slight amount of evidence for this interpretation, the analysis adopted here is that with three dorsal phonemes for PIE.

2.3 *Voiceless aspirates*

Some linguists assume for PIE a series of voiceless aspirates, /ph th k̑h kh k^{w}h/, parallel to the other three series of stops. LEHMANN, *PIEP* 80–84, argues that these could not have been an aspirated series parallel to the other series at the time of secondary palatalization in Indo-Iranian, otherwise /kh k^{w}h/ would have undergone secondary palatalization, but they did not. Sanskrit has *skhalati* 'stumbles', *rikhati* 'scratches' and *iṅkhayati* as causative of *iṅkh-* 'swing', whereas in equivalent forms from PIE /k g gh k^{w} g^{w} g^{w}h/ there is palatalization as in

sacate 'follows' from **selkʷ–*. LEHMANN has other arguments, but this is probably the most convincing one. STURTEVANT, *IHL* 83–6, assumes the voiceless aspirates for PIE, deriving them from voiceless stop plus one of the three voiceless laryngeal /ʔ h x/. The laryngeals /ʔ/ and /x/ are questioned by LEHMANN. Since only one laryngeal /H/ is assumed here and since the later reflexes may be derived from stop plus laryngeal just as well as from voiceless aspirate, the clusters, /pH tH/ etc., are assumed here instead of voiceless aspirates.

2.4 *Semivowels*

EDGERTON, The Indo-European Semivowels, *Lang.* 19.83–124 (1943), has discussed in detail the allophones of the semivowels in PIE. He posits three allophones for each of the semivowels : a consonantal allophone, a vocalic allophone and an allophone that is a vowel followed by a consonant, here called a vocalic-consonantal allophone.

Phonemes	Allophones
/y/	y i iy
/w/	w u uw
/r/	r r̥ r̥r
/l/	l l̥ l̥l
/m/	m m̥ m̥m
/n/	n n̥ n̥n

EDGERTON uses formulas to describe the distribution of these allophones, with *t* equal to any consonant not a semivowel, *k* equal to any second such consonant, *#* equal to pause and *y* equal to any semivowel. When only one semivowel is involved,

1. between consonants, with pause acting like a consonant, the allophone is vocalic :

   tit /tyt/ *#it* /#yt/ *ti#* /ty#/

2. between vowels, the allophone is consonantal :

   aya /aya/ *#ya* /#ya/ *ay#* /ay#/

3. after a vowel before a consonant, the allophone is consonantal :

   ayt /ayt/

4. after a consonant before a vowel, the allophone is consonantal if the preceding syllable is light and vocalic-consonantal if the preceding syllable is heavy :

   ktiya /ktya/ *a:tiya* /a:tya/ *#tiya* /#tya/

   but : *atya* /atya/

When two or more semivowels occur consecutively, the situation is more complex and will not be further discussed here.

2.5 *Long Semivowels*

LEHMANN, *PIEP* 86–91, has pointed out that there is no good reason for assuming that PIE had long semivowels, /r̥: l̥: m̥: n̥:/. It is just as satisfactory to assume that PIE had semivowel plus laryngeal, /rH lH mH nH/, and that the laryngeal was lost in the various dialects of Indo-European. Not all of the IE languages preserve any trace of lengthening, and it is simpler to assume loss of the laryngeal with compensatory lengthening in some dialects and not in others than to assume loss of the laryngeal with compensatory lengthening and then a later loss of lengthening in some dialects. In the case of original /i u/ plus laryngeal, the situation is different. There is evidence for lengthening in the various dialects and there is another /u:/ with which /uH/ coalesces and no evidence that the earlier /u:/ develops any differently than /uH/, so for PIE /i:/ and /u:/ are assumed. This procedure is consistent with the general statement of phonemic change in #1.2. Since /rH/ is phonemically distinct from other phonemic units and combinations of units in Pre-IE and since it is not necessary to assume a phonemic change for this combination from Pre-IE to PIE, it is assumed that it remains ri

PIE as /rH/, but since pre-IE /iH/ and /i:/ coalesce in PIE, here it is necessary to assume a phonemic change and analyze both as /i:/.

2.6 *Long vowels* /e: a: o:/

Since in the various IE languages there is no evidence for assuming that the lengthened grade of original /e/ developed any differently from the long vowels which derived from earlier short vowel plus laryngeal, it is necessary to assume that the reflexes of both of these had coalesced in PIE and only /e: a: o:/ are posited for PIE.

2.7 *The short vowel /ь/*

The vowel /ь/ is here assumed to represent the reduced grade of Pre-IE /e/, which has been called 'schwa secundum'; it does not represent the reduced grade of 'original long vowels', which will here be written /ьH/. That the laryngeal had not yet been lost in PIE in this position is best indicated by the evidence cited by LEHMANN, *PIEP* 91–4, although the structural argument might be used that, whether the phonemicization /ьH/ or /ə/ is used, no phonemic change is involved and the interpretation /ьH/ will therefore be used here. The occurrence of Greek *statós*, *thetós*, and *dotós* indicates that it is probably necessary to assume three laryngeals for PIE, but since this is not necessary for Slavic, only one will be used in this paper.

2.8 *Laryngeals*

The laryngeals assumed by STURTEVANT, *IHL* 19, for Proto-Indo-Hittite are the following: /ʔ/ a glottal stop with fronted timbre, /h/[9] a glottal stop with velar timbre, /x/ a voiceless velar spirant and /r/ a voiced velar spirant. LEHMANN, in disagreement with STURTEVANT, assumes that these four laryngeals are continued into PIE. It is also possible that not all four of the PIH laryngeals survived into PIE, although the evidence of laryngeal after reduced vowel in Greek and the aspirated stops would suggest that

there was still a four-way contrast in PIE. The symbol /H/ has been used to indicate any one of the laryngeals, and since I have found no evidence in Slavic to indicate more than one laryngeal, only this symbol will be used as a cover symbol for any one of the laryngeals, which is the operational equivalent of assuming one laryngeal for PIE.

2.9 *PIE accent*

That PIE had an accent of some sort is shown by the evidence of Germanic and Sanskrit. PIE [p t k s] normally appear in Germanic as [f θ x s], but in voiced surroundings, if the immediately preceding vowel was not accented, appear as [v ð ɣ z]. In the following example, where the Sanskrit forms show an accent on the syllable preceding the [t], the OE and OHG forms show one reflex and where Sanskrit shows the accent not preceding the [t], the OE and OHG forms show a different reflex.

	Pres.	Perf. 1 sg.	Perf. 1 pl.	Participle
Skt.	*vártate*	*vavárta*	*vavṛtmá*	*vṛttás*
OE	*weorþe*	*wearþ*	*wurdon*	*worden*
OHG	*wirdu*	*ward*	*wurtum*	*wortan*

For the position of the accent to have been a conditioning factor in the development of the consonants in Germanic, the accent must have been present in Germanic in the same position in which it occurs in Sanskrit, and must then have been a feature of PIE. It might be assumed, however, that the position of the accent was conditioned by the ablaut grade. This may have been a feature of Pre-IE, but could not have been true of PIE just before it split up because both Greek and Sanskrit agree in having abstract nouns formed with *o*-grade vocalism of the stem and a thematic suffix accent on the stem, Gk. *tómos* 'cut', *trómos* n. 'trembling', Skt. *váras* 'choice' *śókas* 'brilliance', and also forms that are identical except that the accent is on the suffix and the forms are agent nouns,

nouns indicating the result of an action or adjectives, Gk. *tomós* 'cutting', *tromós* adj. 'trembing', Skt. *varás* 'suitor', *śokás* 'brilliant'. Unless this was an independent development in both Greek and Sanskrit, the position of the accent could not have been phonologically conditioned in PIE. It is assumed, then, that the position of the accent in a word in PIE is phonemic, although whether this accent was phonetically a pitch accent or a stress accent cannot be determined from the evidence given above. Greek and Sanskrit had a metric system based on the length of syllables and independent of the position of the accent, which suggests that the accent was of the pitch variety rather than the stress variety. There are also descriptions of the Greek and Vedic systems of accentuation stating them to be of the pitch variety. This is frequently considered evidence that the the PIE accent was of the pitch variety, but consideration of this problem will be deferred until the end of this section.

There is evidence in Greek and Lithuanian that has often been cited to show that PIE must have had not one such type of accent, but two different accents. Greek has forms where a final acute accent corresponds to a Lithuanian final grave : n.sg.f. Gk. *agathē'* Lith. *gerà*; n.pl.m. Gk. *agathoí*, Lith. *gerí*, but there are also forms where a Greek circumflex corresponds to a Lithuanian circumflex : g.sg.f. Gk. *agathēs*, Lith. *gerõs*; inst.pl.m. Gk. *agathoîs*, Lith. *vilkaîs*. Given these correspondences, two different tones or pitches are assumed and a PIE acute tone is reconstructed for the Greek acute and Lith. grave, and a PIE circumflex for the Greek and Lithuanian circumflex. Kurylowicz, *Lang.* 8.200–10 (1932), has shown that the Greek circumflex has arisen independently in Greek from contraction in Greek, and not from PIE or from analogical extention. If the Greek circumflex is a Greek development, then there is no evidence for assuming more than one type of accent in PIE.

MEILLET, *Introd.* 142, says that there is no evidence properly attested by several languages that would indicate that a word possessed more than one accent. DE SAUSSURE, *IF. Anz.* 6.157 ff., stated that in Balto-Slavic an acute tone attracts the stress from a preceding short vowel or circumflex tone. This may be illustrated by Lith. 1 sg. *arìu*, 3 sg. *ãria*, 1 sg. *liežiù*, 3 sg. *liẽžia*, where there is a difference in the position and nature of the tone in the first and third singular, and also by Russ. 1 sg. /arjú/ 'I plow', 3 sg. /órjit/, 1 sg. /ljižú/ 'I crawl', 3 sg. /ljížit/, where there is a difference in the position of the stress. These forms may be contrasted with Lith. 1 sg. *júosiu*, 3 sg. *júosia* and Russ. /apayášu/ 'I gird', 3 sg. /apayášit/, where there is no such difference. DE SAUSSURE'S interpretation assumes that a form **liẽžiú* becomes *liežiù*, but a form **júosiú* becomes *júosiu* or in more abstract terms *–˜ –′ becomes ––′, whereas *–′ –′ becomes –′–. This presupposes tones on both stressed and unstressed vowels and therefore phonemic tone and stress. Since there is no other evidence for assuming tone on both stressed and unstressed vowels and since this evidence is limited to the closely related branches of Baltic and Slavic, it will be considered a development peculiar to these branches and not a feature of PIE.

PIE, then, had a word accent that was phonemic. Since there is no evidence that a word had more than one accent and since Greek, Lithuanian and Vedic apparently developed their accentuation systems independently, there is no satisfactory evidence that PIE had more than one type of accent. The accent in PIE could very well have been characterized by both stress and pitch, and there is no evidence as to which characteristic might have been significant and which non-significant. Greek, Lithuanian and Vedic could all have developed their pitch accent from a PIE that had a stress accent just as well as from a PIE that had a pitch accent.

3. PIE to PROTO-SLAVIC

The developments discussed in this section are those that took place between PIE and Proto-Slavic. No attempt is made to determine intermediate stages between PIE and PSl partly because this is a subject of considerable difference of opinion among linguists and partly because it is of greater interest to the Indo-Europeanist or Slavicist than to the specialist in Russian.

3.1 *Loss of Laryngeal*

The laryngeal consonant (or consonants) of PIE is lost in all the positions in which it occurs.

3 1.1 *Laryngeal after voiceless stop*

A laryngeal in position after a voiceless stop is lost. After the stops /p t/ it is lost with no effect on the preceding consonant, but after /k/ the combination results in [x]. This [x] is in contrast with /k/ which was not followed by laryngeal and is, therefore, a new phoneme, /x/.

PIE /pH/ Gk. *phūsa* Arm. *p'uk'* 'breath', Skt. *pupphuṣas* 'lung', Lith. *pùšu* 'I breathe', OB. *pyxati* 'breathe'.

/tH/ Skt. *asthāt* 'he stood up', Lith. *stóti* 'stand', OB. *stati* 'stand'.

Skt. *panthās* 'road', Av. *paθō* (gen.), Gk. *póntos* (gen.), Lat. *pontis* (gen.), OB. *pǫtĭ* 'path'.

/kH/ Skt. *śākhā'* Arm. *çax*, Lith. *šakà*, Goth. *hōha* 'plow', OB. *soxa*.

Goth. *hlaibs*, Lat. *lībum*, R. *xleb* 'bread'.

PEDERSEN, *IF* 5.49–51, cites a few more possible cases of the development of /kH/ into PSI /x/ and says that it

might be reasonable to explain R. /xjljep/ as a borrowing, but that it is unreasonable to explain two of the three forms cited above as borrowings. MEILLET, *SlCom*, and STURTEVANT, *Lang.* 17, agree with PEDERSEN in accepting the development of /kH/ to /x/, but VONDRAK *SlGr.*, and VAILLANT, *GrComp.*, do not accept this development. By way of disputing this phonetic development a form is cited such as Skt. *khadati* 'he kills', Lith. *kándu*, R. /kus/ 'piece'.

3.1.2 *Laryngeal after semivowel*

The laryngeal is lost after the semivowels /l r m n y w/. This takes place after all the allophones of the semivowels. With the loss of the laryngeal a difference in tone develops between the reflex of /lH rH mH nH yH wH/ and the reflex of /l r m n y w/ not followed by a laryngeal. This difference in tone will be discussed later (cf. #3.10). An example of /l/ not followed by laryngeal is Skt. *vṛkas* 'wolf', Lith. *vil˜kas*, OB. *vlĭkŭ* and of /lH/ is Skt. *pūrṇas* 'full', Lith. *pìlnas*, OB. *plĭnŭ*.

3.1.3 *Laryngeal after /ь/*

A laryngeal in position after the reduced grade of PIE /e/, i. e. /ь/, is lost and the resultant reflex coalesced with /o/. There are not many certain examples of this develop-in Slavic, but some may be cited :

Skt. *sphiras* 'richly', OB. *sporŭ*.

OB. *dojǫ* 'I suck' (from *dhьH), Lat. *fēmina* (from *dheH)

OB. *stojati* 'stand', Skt. *sthitas*, Lat. *status*, Gk. *statós*, (all from *stьH)

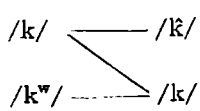
There is also some evidence that after the loss of the laryngeal in this position the vowel diappeared : OB. *stryĭ* (from earlier *pьHtr-) 'paternal uncle', Skt. *pitṛvyas*, Lat. *patruus*, Gk. *pátrōs*. There is not, however, enough evidence to be sure under what conditions the different reflexes developed.

3.2 *Loss of Labialization*

Phonetically the labialization of the labiovelars, /k^{w} g^{w} g^{w} h/, is lost producing [k g gh]. Phonemically the labiovelars coalesce with the velars:

This development reduces the number of positions in the stop system from five to four. This change takes place in all the satem languages, and, if it can be assumed that the centum languages, including Tocharian, are indeed peripheral languages[1], then this may be the change that separates the satem from the centum languages, although there is contradictory evidence which may be found cited in most of the handbooks.

If for PIE only two dorsal stop series are assumed, a phoneme /k/ with allophones [$\hat{k}$] and [k] and a phoneme /k^{w}/, then the loss of labialization of the labiovelar would require that the resultant [k] and the back allophone of /k/ be classed as the same phoneme and the front allophone of /k/ would be a different phoneme, /$\hat{k}$/. Phonemically,



This assumption implies an innovation on the part of the satem languages, i. e. the partial phonemic coalescence stated above, and implies no change on the part of the centum languages.

Either assumption for PIE would result in a pre-Slavic system with /$\hat{k}$/ and /k/ as phonemes in a four position system:

p	*t*	*$\hat{k}$*	*k*
b	*d*	*$\hat{g}$*	*g*
bh	*dh*	*$\hat{g}$h*	*gh*

Examples of this change are :

PIE /k/ OB. *krŭvĭ* 'blood', Lith. *kraũjas*, Gk. *kréas* 'meat' Lat. *cruor*, Skt. *kraviṣ*, R. /krofj/, Eng. *raw*

OB. *ključĭ* 'key', Lith. *kliúti* 'to hang', Lat. *clāvis*, R. /ključ/

PIE /k^{w}/ OB. *kŭto* 'who', Lith. *kàs*, Gk. *tis*, Lat. *quis*, Skt. *kás*, R. /kto/, Eng. *who*

OB. *vlĭkŭ* 'wolf', Lith. *vjĭkas*, Skt. *vṛkas*, Gk. *lúkos*, R. /volk/, Eng. *wolf*

OB. *pekǫ*, 'I bake', Skt. *pácati*, Lat. *coquit*, R. /pjikú/

PIE /g/ OB. *ostegŭ* 'vest', Lith. *stógas* 'roof', OHG. *dah*, Lat. *tegō* 'I cover', Eng. *thatch*

OB. *bogŭ* 'God', Skt. *bhágas* 'partaker', OP. *baga* 'God' Gk. *phageĩn*, 'to eat', R. /box/

PIE /g^{w}/ OB. *govędo* 'cow', Gk. *boũs*, Skt. *gauṣ*, Eng. *cow*.

OB. *běgŭ* 'flight', *-běgnǫti* 'to run', Lith. *bęgu* 'I flee', Gk. *phébomai*, 'to flee', *phóbos* 'flight'.

PIE /gh/ OB. *gostĭ* 'guest', Goth. *gasts*, Lat. *hostis*, R./gosjtj,/ Eng. *guest*.

OB. *mĭgla* 'mist', Lith. *miglà*, Gk. *omíkhlē*, Skt. *meghás* 'cloud',

PIE/g^{w}h/OB. *gorĕti* 'to burn', Gk. *thermós*, Lat. *formus*, Skt. *gharmás*, R./garjétj/, Eng. *warm*

OB. *gŭnati* 'to drive', Lith. *genù*, Gk. *theínō* 'I kill', *phónos* 'murder', Lat. *of-fendo*, Skt. *ghnánti* 'they strike', R. /gnátj/.

3.3 *Loss of aspiration*

The aspiration of the voiced aspirated stops is lost. Phonemically this causes the coalescence of the voiced aspirated stops with the voiced stops, i. e. /bh/ and/b/ coalesce as /b/, /dh/ and /d/ as /d/, etc. This changes

the phonological system to one of two series of stops in four different positions :

p	*t*	*ḱ*	*k*
b	*d*	*ĝ*	*g*

The chronological position of this change relative to the previous one is not clear. It takes place in Baltic as well as Slavic, but it is not found in the other satem groups, Indo-Iranian[2] and Armenian. This in itself does not necessarily indicate that it is subsequent to the loss of labialization, which may have occurred independently in the various satem languages, but it is likely to have been later and is so placed here.

Examples of this change are :

PIE /b/ OB. *bolĭjĭ* 'larger', Lat. *dē-bilis* 'weak', Skt. *bálam* 'strength'.

OB. *dobrŭ* 'good', Lat. *faber*, Eng. *dapper*

PIE/bh/ OB. *bĭrati* 'to take', Lat. *ferō*, Gk. *phéro*, Skt. *bhárāmi*, R./bratj/, Eng. *bear*

OB. *bratrŭ*, *bratŭ* 'brother', Lat. *frāter*, Gk. *phrā'tōr* Skt. *bhrātā–*, R./brat/, Eng. *brother*

PIE/d/ OB. *desętĭ* 'ten' Lith. *dẽšimt*, Gk. *déka*, Lat. *decem*, Skt. *daśa*, R./djésjitj/, Eng. *ten.*,

OB. *dati* 'to give', Lith. *dúoti*, Lat. *dare*, Gk. *dídōmi*, Skt. *dadāmi*, R./datj/

PIE /dh/ OB. *dĕjati* 'to lay', Lith. *deti*, Goth. *gadeps* 'deed' Lat. *fēcī*, Gk. *títhēmi*, Skt. *dádhāmi*

OB. *medŭ* 'honey', Gk *méthu*, Skt. *madhu*, R. /mjot/, Eng. *mead*

PIE/g/ OB. *bogŭ* 'God', Skt. *bhágas*, Gk. *phageīn* 'to eat', R. /box/.

PIE/g^w/ OB. *govędo* 'cow', Gk. *boũs*, Skt. *gauṣ*, Eng. *cow*.

PIE/gh/ OB. *dlīgŭ* 'long', Lith. *ilgas*, Gk. *dolikhós*, Lat. *in-dulgeō*, Skt. *dīrghás* R. /dólga/, Eng. *long*.

PIE/g^wh/ OB. *snĕgŭ* 'snow', Lith. *sniẽgas*, Gk. *nípha*, Lat. *nivem*, *ninguit*, R. /sjnjek/, Eng. *snow*.

This means, of course, that PIE/g, gh, g^w, g^wh/ all coalesce as pre-Slavic /g/ (cf. also # 3.2). The PIE phonemes /ĝ/ and /ĝh/ also coalesce, but, because they also undergo other changes, examples are not cited until # 3.5.

3.4 *Semivowel phonemes*

Each of the semivowel phonemes /l r m n y w/, as discussed in # 2.3, consisted of three allophones, one vocalic, one consonantal and one vocalic-consonantal. Only the latter two are discussed in this section; the vocalic allophones are discussed in # 3.6 along with the vowels.

3.4.1 *Consonantal allophones*

The consonantal allophones of /l r m n y w/ do not undergo any change in initial or intervocalic position, but deserve to be mentioned here because of the special developments of the other allophones of these phonemes.

Examples in initial position are :

PIE/r/ OB. *rudrĭ* 'red', Lith. *raũdas*, Gk. *eruthrós*, Lat. *ruber*, Skt. *rudhirás*, Eng. *red*, R./rudá/ 'ore'.

PIE/l/ OB. *slovo* 'word', Gk. *kléos*, Lat. *in-clutus*, Skt. *śrávas* 'fame', R. /slóva/, Eng. *loud*. (the development after *s* is the same as in initial position).

PIE/m/ OB. *mati* 'mother', Lith. *motẽ* 'wife', Gk. *mē'tēr*, Lat. *māter*, Skt. *mātā*, R./matj/, Eng. *mother*

PIE/n/ OB. *nebo* 'sky', Lat. *nebula*, Gk. *néphos* 'cloud', Skt. *nábhas* 'mist', R. /njóba/ 'palate'

PIE/y/ OB. *juxa*/yuxa/'soup', Lith. *júše*, Lat. *jūs*, Skt. *yuṣam*.

PIE/w/ OB. *vezǫ*, *vesti* 'lead', Lith, *vezu*', Gk. *ókhos*, Skt. *vahati*, R. /vjizú, vjisjtjí/.

In the last case a phonetic change of [w] to [v] is assumed, but this is not a phonemic change (cf. # 1.2) since the change of phonemicization from /w/ to /v/ is arbitrarily elected; it is not compulsory. It is not possible to date this development relative to others, but since all the Slavic languages show /v/, it is assumed at this point, although it is recognized that it would be quite possible to phonemicize as /w/ all the way down to PSl.

In position after a vowel and before a consonant the phonemes /r l/ remain. It is in this position that vowel plus /r l/ show a great variety of reflexes in the Slavic languages, which may most simply be explained by assuming that the changes are to be attributed to the individual languages. Phonetically a change such as that suggested by VAILLANT, *Gr Comp.* 166, to *arrd or to *ard may have taken place, but there is no compelling reason to assume any structural change and the phonemicization /ord, erd/ is adopted. Examples are :

PSl. */serda/, OB. *srěda*, R. /sjirjidá/ 'middle, Wednesday', Eng. *heart*

Pre-Sl. */golva/ 'head', OB. *glava*, Lith. *galvà*, R. /galavá/.

The phonemes /y w/ in position after a vowel and before a consonant are discussed under vowel developments (cf. # 3.6 and 3.7.4), and the phonemes /m n/ in this position are discussed under vowel developments (cf. # 3.6),

In position after a consonant and before a vowel, the phonemes /l r m n w/ are discussed under consonant clusters (cf. # 3.9) and the phoneme /y/ under palatalization (cf. # 3.7.3).

3.4.2 *Vocalic-consonantal allophones*

In PIE the allophones of / l r m n y w / should be vocalic-consonantal only if the preceding syllable is heavy or if the preceding consonant is word initial (cf. # 2.3). The vocalic element of these vocalic-consonantal allophones coalesce as either [i] or [u], thus [l̥l r̥r m̥m n̥n iy uw] develop into either [il ir im in iy iv] or into [ul ur um un uy uv]. The conditions under which [i] is found and under which [u] is found are not clear, but they both behave in their subsquent history like PIE [i, u], becoming PSl [ĭ, ŭ], (cf. # 3.6). Vaillant Gr Comp. 167–73, considers that the forms with [u] occur after a labiovelar and the forms with [i] under other conditions. This is satisfactory for a form like OB. *gŭnati* 'to chase' from a root **g*^{w}*hen-* in the reduced form **g*^{w}*hn-*, but not for a form like OB. *požĭrǫ* 'I swallow' from the reduced grade of the root **g*^{w}*her-*. It should be noted that if Vaillant's explanation is accepted, then the [i] and the [u] forms must have been redistributed before the occurrence of front-vowel palatalization (cf. # 3.7.1) because from the same root **g*^{w}*her-* in the reduced form doublets occur : OB. *požĭrǫ* 'I swallow' from an earlier **gir-* which caused palatalization and OB. *grŭtanĭ* 'throat' from an earlier **gur-* which did not cause palatalization.

Forms which show reflexes of the vocalic-consonantal allophones may be found most extensively in OB either in certain present tense forms or in infinitives : with earlier *[i], OB. *žĭmǫ* 'I press' *pĭnǫ* 'I hang', *lĭjǫ* 'I pour', *bĭrati* 'to gather'; and with earlier *[u], OB. *gŭnati* 'to chase', *zŭvati* 'to call', *dŭmǫ* 'I blow'. There is a predominance of forms from earlier *[i] which tends to support VAILLIANT's contention that this is the more normal or regular reflex, but it is difficult to draw any satisfactory conclusions.

The result of this development is to produce forms in [il] etc. and forms in [ul] etc. which contrast with each

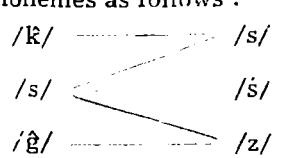
other. Also the [i] and [u] are identical with the [i] and [u] posited as vocalic allophones of the semivowel phonemes. The reflex of [l̥l] can no longer be considered as an allophone of /l/ but must be considered as consisting of two segments, phonemically /il/ or /ul/ as the case may be. The effect of this change is to do away with the vocalic-consonantal allophones and to cause the phonemes /y/ and /w/ to split into two phonemes each, the first into /i/ and /y/ and the second into /u/ and /v/.

3.5 *Palatals*

The palatal stops, /ḱ/ and /ĝ/, the latter either from PIE /ĝ/ or PIE /ĝh/, become assibilated to [s] and [z] respectively. Martinet[3], discussing this development, asumes that the PIE phoneme /s/ had two voiceless allophones, a high allophone with tongue tip raised [ś] and a lower allophone [s], and a voiced allophone [z]. The voiced allophone occurred in position before a voiced stop, symbolized as *zd*, the high voiceless allophone occurred after /y w r i: u:/[4] and before a vowel, symbolized as *iśa*, and the lower voiceless allophone occurred elsewhere, symbolized as *as* and *ist*. The development may be tabulated in three stages as follows :

ḱ /ḱ/	*as* /as/	*ist* /ist/	*iśa* /isa/	*zd* /sd/	*ĝ* /ĝ/
s /š/	*as* /as/	*ist* /ist/	*iśa* /isa/	*zd* /sd/	*ž* /ž/
s /s/	*as* /as/	*ist* /ist/	*iśa* /iśa/	*zd* /zd/	*z* /z/

In the second stage [ḱ] and [ĝ] become [š] and [ž] respectively, a sub-phonemic change, and, being kept distinct from [ś], may be phonemicized at this stage as either /ḱ ĝ/ or as /š ž/. In the third stage [š] and [ž] develop into [s] and [z] respectively, causing the phoneme /s/ to split into three phonemes as follows :



The new phoneme /ś/ has a very limited distribution and develops a back pronunciation becoming [x]. This [x] coalesces with the [x] that had developed from /kH/.

Examples of this development are :

PIE /ḱ/ >PSl /s/

OB. *sŭto* 'hundred', Lith. *šimˇtas*, Lat. *centum*, Gk. *hékaton* Skt. *śatam*, R. /sto/, Eng. *hundred*.

OB. *desętĭ* 'ten', Lith. *dẽšimt*, Lat. *decem*, Gk, *déka*, Skt. *daśa*, R. /djésjitj/, Eng. *ten*.

PIE /ǵ/ >PSl /z/.

OB. *znati* 'to know', Lith. *zinóti*, Lat. co-*gnōscō*, Gk. *gignō'skō*, Skt. *jānāti*, R. /znatj/, Eng. *know*

OB. *zǫbŭ* 'tooth', Gk. *gómphos*, Skt. *jambhas*, R. /zup/, Eng. *comb*

PIE /ǵh/ >PSl /z/

OB. *vezǫ* 'I lead', Lith. vezù, Gk. *ókhos*, Lat. *vehō*, Skt. *váhati*, R. /vjizú/, Eng. *wagon*

OB. *zima* 'winter', Lith *zèmà*, Gk. *khíōn* 'snow', *kheimō'n* 'winter', Lat, *hiems* Skt. *himas*, R. /zjimá/.

PIE /s/ < PSl /s/

OB. *sedmĭ* 'seven' Lith, *septy'nì*, Lat. *septem*, Skt. *saptá*, R. /sjemj/, or /sjem/, Eng. *seven*,

OB. *sĕsti* 'to sit down', Lith. *sésti*, Gk. *édos*, Lat. *sedeō*, Skt. *sádas*, R. /sjesjtj/, Eng. *sit*.

PIE /s/ > PSl /x/

OB. *snŭxa* 'daughter-in-law', Lat. *nurus*, Gk. *nuós*, Skt. *snuṣā*.

OB. *smĕxŭ* 'laughter', Lat. *mīrus* (r < s). In OB the [ĕ] < [oy] and hence the [s] was preceded by [y].

OB. *praxŭ* 'dust' (from an earlier **porsŭ* with [r] preceding the [s]), Skt. *púriṣam* 'earth', R.

/pórax/, but OB. *prŭstĭ* with [s] retained when a consonant follows.

PIE /s/ > PSl /z/

OB. *gnězdo* 'nest', Skt. *nīḍas*, R. /gnjizdó/, Eng, *nest*

Considering the two origins mentioned above for the phoneme /x/, it should have a low frequency particularly in initial position, but this frequency has been considerably increased by analogical extension. Thus, the PIE root **sed–* 'sit' in the o-grade form, **sod–*, should appear as **xod–* in verb forms with the prefixes OB. *pri–*, *u–* and *prě–* (from earlier **per–*) and the OB. forms *prixoditi*, *uxoditi* and *prěxoditi* occur. With other prefixes or without prefix the expected form is **soditi*, but only *xoditi* occurs, obviously by analogy with the forms where [x] is expected. In OB the loc. pl. of *u*-stems, e.g. *darŭxŭ*, of *i*-stems, e.g. *pǫtĭxŭ* and of *o*-stems, e.g. *rocěxŭ* (nom. sg. *rokŭ*) has developed regularly, but the loc. pl. of *a*–stems, e. g. *ženaxŭ* has developed a [x] by analogy with the others. Also the aorists in OB, *pluxŭ* from *pluti* 'swim', *byxŭ* from *byti* 'be' and *žixŭ* from *žiti* 'live' are regular, but aorists like *dělaxŭ*, *vedoxŭ* and *viděxŭ* are analogical.

By this stage we have the following consonantal phonemes : /p t k b d g s z x l r m n y v/. However, the subsequent history of this system suggests that the phonemes may best be ordered as follows :

labials	*p b m v*
dentals	*t d s z*
velars	*k g x*
resonants	*l n r*
spirant	*y*

3.6 *Vowel development*

Vowel changes take place, the main phonetic characteristic of which is the coalescence of the back vowels, /o/

and /a/, in all positions. The specific results of these changes are the following :

$\begin{matrix} a \\ o \end{matrix} > o$	$e > e$
$\begin{matrix} a: \\ o: \end{matrix} > a$	$e: > æ$

In more limited positions the changes are :

$\begin{matrix} ay \\ oy \end{matrix} > oy$	$ey > i, ĭy$
$\begin{matrix} aw \\ ow \end{matrix} > u, ov$	$ew > yu, ov$
$am, om > ǫ, om$	$em > ę, em$
$an, on > ǫ, on$	$en > ę, en$
$al, ol > ol$	$el > el$
$ar, or > or$	$er > er$

The long high vowels and the vocalic allophones of the semivowel phonemes, /y/ and /w/, also undergo changes :

$u: > ṷ$	$i: > ṷ$
/w/ [u] > ŭ	/y/ [i] > ĭ

Phonemically /o/ and /a/ coalesce as /o/ in all positions except before /w/ plus consonant, in which position they coalesce, but not as /o/. The phonemes /a:/ and /o:/ coalesce as /a/. The phoneme clusters /oy/ and /ay/ coalesce and may be represented phonemically as /oy/ indicating that this reflex had a back component, since /k/ is not palatalized to [č] before this reflex as it is before all the front vowels, and also a front component since it develops later into a front vowel. Where more than a single development is indicated the first one occurs in tautosyllabic position, [i u yu ǫ ę], and the others in heterosyllabic position, [ĭy ov om on em en]. The [ǫ] is in complementary distribution with both [om] and [on] and [ę] is in complementary distribution with both [em] and [en]. The nasalization may arbitrarily be assigned to the phoneme /n/, which then would have two allophones, [n] and [̃].

For reasons that are historical rather than descriptive, [ę] and [ǫ] will here be considered separate phonemes.

The result of these developments is that the earlier vowel system with a three-way contrast in position :

e	*o*		*e:*	*o:*
	a			*a:*

develops into the following system of oral vowels :

i	ɨ
	u
ĭ	ŭ
e	o
æ	a

The phonetics assumed here is that [i] is a high front unrounded vowel, [ɨ] a high unrounded vowel, either central or back (at this stage it may very well have been a back vowel since it develops from a high back vowel), [u] a high back rounded vowel, [ĭ] a high-mid unrounded vowel, and possibly somewhat centralized, [ŭ] a high-mid back unrounded vowel, possibly somewhat centralized, [e] a mid front unrounded vowel, [o] a mid back rounded vowel, [æ] a low front unrounded vowel and [a] a low central or back vowel, either rounded or unrounded. Phonologically there are two main changes in the system. First, the PIE threefold contrast in position of vowels, /e/~/a/~/o/, is replaced by a twofold contrast in position, /e/~/o/. This contrast of front vowel versus back vowel is found for all vowels except /u/ which does not contrast with an equivalent front vowel. The contrast in rounding is not a constant one and is therefore subsidiary to the contrast in frontness. Second, the PIE contrast between short and long vowels, /e/ ~ /e :/, etc., has changed to a contrast in quality, /e/ ~ /æ/, etc. Some vowels may have been phonetically shorter than others, but, unless a quite different analysis is made there is no reason to

assume that length is a significant feature (cf. # 3.7.2) It is unreasonable to assume the quality differences assumed here and length also, and contrariwise, if length is assumed, then it would be necessary to assume a quite different situation with respect to quality.

Examples of the vowel developments are :

PIE /a/ > /o/

OB. *osĭ* 'axis', Lith. *ašìs*, Lat. *axis*, Gk. *áksōn*, Skt. *ákṣas*,

OB. *dobrŭ* 'good', Lat. *faber*, Eng. *dapper*, R./dóbray/

PIE /o/ > /o/

OB. *oko* 'eye', Lith. *akìs*, Lat. *oculus*, R. /óka/

OB. *nošti* 'night', Lith. *naktìs*, Lat. *noctem* (acc), Eng. *night*, R./noč/

PIE /e/ > /e/

OB. *berǫ* 'I take', Gk *phérō*, Lat. *ferō*, Skt. *bharāmi*, Eng. *bear*, R./bjirú/

OB. *nebo* 'heaven', Gk. *néphos*, Skt. *nabhas*,R./njóba/ 'palate'

PIE /a:/ > /a/

OB. *bratrŭ*, *bratŭ* 'brother', Lat. *frāter*, Gk. *phrā'tōr* Skt. *bhrātar* Eng. *brother*, R./brat/.

OB. *bajǫ* 'I relate', Lat. *fāma*, Gk. *phā'mi* R. /básjnji/ 'fable'.

PIE /o:/ > /a/

OB. *darŭ* 'gift', Lat. *dōnum*, Gk. *dōron*, R. /dar/

OB. *dŭva* 'two', Lat. *duō*, Gk. *dúō*, Skt. *dvā*, Eng. *two*, R. /dva/.

PIE /e:/ > /æ/

Pre-Sl. */dæti/ 'to place', OB. *dĕti*, Lat. *fēcī*, Gk. *títhēmi* Skt. *dadhāmi*, Eng. *do*, R. /djetj/.

PIE /w/ [u] > /ŭ/

OB. *rŭdrŭ* 'red', Lat. *ruber*. Gk. *eruthrós*, Skt. *rudhirás*, Eng. *red*, R. /rudá/ 'ore'.

OB. *bŭděti* 'to awaken', Lith. *budéti*, Skt. *bubudhima* (1. pl.).

PIE /y/ [i] > /ĭ/

OB. *vĭdova* 'widow', Lat, *vidua*, Skt. *vidhavā*, Goth. *widuwō*, Eng. *widow*, R. /vdavá/.

OB. *čĭto* 'what', Lat. *quid*, Gk. *tí*, Skt. *cit*, Eng. *what*, R. /što, čto/.

PIE /u:/ > /ɨ/

Pre-Sl. */biti/ 'to be', OB. *byti*, Gk. *phū'ō*, Lat. *fūturus*, Skt. *bhū-*, Eng. *be*, R. /bitj/.

Pre-Sl. */sinŭ/ 'son', Lith. *sunùs*, Skt. *sūnuṣ*, Eng. *son*, R. /sin/

PIE /i:/ > /i/

OB. *živŭ* 'alive', Lat. *vīvus*, Gk. *bíos*, Skt. *jīvas*, Eng. *quick*, R. /žif/

OB. *tri* 'three' (neuter), Lat. *trīginta*, Skt. *trī*, Eng. *three*, R. /tjrji/.

PIE /oy/ > /oy/

Pre-Sl. */voydɤti/ 'to know', OB. *vědĕti*, Gk. *oĭda*, Skt. *veda*, Eng. *wot*, R. /vjetj/ 'you know.'

PIE /ay, > /oy/

Pre-Sl. */loyvŭ/ 'left', OB. *lěvŭ*, Lat. *laevus*, Gk. *laiós*, R. /ljévay/.

PIE /ey/ > /i/

OB. *iti* 'to go', Lith. *eĩti*, Skt. *etum*, Gk. *eĩmi*, R. /itjí/

OB. *zima* 'winter', Gk. *kheimō'n*, R. /zjimá/

PIE /ey/ > /ĭy/

Pre-Sl. */trĭye/ 'three' (masc.), OB. *trĭje*, Lat. *trēs*, Gk. *treîs* Skt. *tráyas.*

Pre-Sl. */-ĭye/ as nom.pl. of m. *i*-stems, OB. *gostĭje*, Gk. *-eis*, Skt. *-ayas.*

VAILLANT, *GrComp.* 110–1, states that this /ĭy/ goes back to the vocalic-consonantal allophone of /y/, the reduced grade of /ey/ before a vowel, which might be so, although this allophone would only be expected when preceded by a short vowel and a single consonant, and other languages show a normal grade /ey/ in these forms.

PIE /aw/ > /u/ or /ov/

OB. *uxo* 'ear' Lith. *ausìs*, Lat. *auris*, Eng. *ear*, R. /úxa/

OB. *ovĭsŭ* 'grain', Lith. *aviza*, Lat. *avēna* (from *avesna*), R. /avjós/

PIE /ow/ > /u/ or /ov/

OB. *buditi* 'to waken', Skt. *bodhayati*, R. /budjítj/

*/-ove/ as nom. pl. of *u*-stems, OB. *synove* 'sons', Skt. *sunavas.*

PIE /ew/ > /yu/ or /ov/

Pre-Sl. */byudǫ/ 'I obsérve', OB. *bljudǫ*, Gk. *peúthomai* Skt. *bodhati*, R. /bljudú/.

OB. *novŭ* 'new', Lat. *novus*, Gk *neós*, Skt. *návas*, Eng. *new*, R. /nóvay/

The reflex /yu/ occurs relatively rarely and it may be that /u/ is sometimes a reflex of /ew/ rather than of /ow/ just as /ov/ rather than /*ev/ is the regular reflex of /ew/ in heterosyllabic position.

PIE/am, an/ > /ǫ, om, on/

OB. */ǫglŭ/ 'corner', Lat. *angulus*, EArm. *ank'yun*, R. /úgal/.

PIE/om, on/ > /ǫ, om, on/

OB. *zǫbŭ* 'tooth', Gk. *gómphos*, Skt, *jámbhas*, Eng. *comb*, R./zup/

OB. *domŭ* 'house', Gk. *dómos*, Lat. *domus*, Eng. *tame*, R. /dom/.

PIE/em, en/ > /ę, em, en/

OB. *pętĭ*, Gk. *pénte*, Skt. *pañca*, EArm. *hing*, Eng. *five*, R. /pjatj/

OB. *kamene* 'stones' (nom. pl.), Skt. *rājānas* 'kings' (nom. pl.)

PIE/al, ol/ > /ol/

Pre-Sl. */golva/ 'head', OB. *glava*, Lith. *galvà*, R. /galavá/

PIE/el/ > /el/

Pre-Sl. */pelnŭ/ 'booty', OB. *plěnŭ*, Lith. *pel˜nas*.

PIE/ar, or/ > /or/

Pre-Sl. */gordŭ/ 'enclosure', OB. *gradŭ*, Goth. *gards*, R./górat/

PIE/er/ > /er/

Pre-Sl. */serda/ 'middle', OB. *srĕda*, Goth. *hairto*.

The vocalic allophones of /l r/, like the vocalic-consonantal allophones (cf. # 3.4.2), develop a vowel in front of them which may be identified with the reflexes of the vocalic allophones of /y w/, i. e., /l/ [l̥] becomes [ĭl ŭl] and /r/ [r̥] becomes [ĭr ŭr]. VAILLANT, GrComp. 167–73, assumes that [ŭl] and [ŭr] is a conditioned development occurring when /r l/ is preceded by a labio-velar, and [ĭl] and [ĭr] occur elsewhere. This explanation is satisfactory for a form like Pre-Sl. **gŭrdlo* 'throat', from a root **g*^{w}*erə-* in reduced grade form, but it is not satisfactory for OB. *požĭrǫ* 'I swallow' from the same root.

It also does dot explain forms with [ŭl ŭr] where there is no labio–velar, e. g. OB. *brŭzŭ* 'fast', R./bórzay/. There seems to be no reasonable explanation for the conditions under which the various reflexes of these allophones developed. Examples are :

PIE /r/ [ṛ] > /ĭr, ŭr/

Pre-Sl. */gŭrdlo/ 'throat', Lith. *gìrtas*, Skt. *gīrṇás*, R. /górla/

Pre-Sl. */mĭrtvŭ/ 'dead', OB. *mrŭtvŭ*, Skt. *mṛtiṣ*, Lat. *mors*, R. /mjórtvay/

PIE /l/ [ḷ] > /ĭl, ŭl/

Pre-Sl. */vĭlkŭ/ 'wolf', OB. *vlŭkŭ*, Lith. *vil˜kas*, Skt. *vṛkas*, Pol. *wil˜k*, Eng. *wolf*, R. /vólk/

Pre-Sl. */dŭlgŭ/, 'duty', OB. *dlŭgŭ*, Pol. *dług*, R. /dólk/

An alternative solution to the one just proposed above is to assume [ṛ'] for [ĭr], [ṛ] for [ŭr], [ḷ'] for [ĭl] and [ḷ] for [uḷ], where [ṛ, ḷ] represent back varieties and [ṛ', ḷ'] represent front varieties. This is the position adopted by VAILLANT, *GrComp*, 176–7, but it is not adoptrd here because it requires the assumption of four new phonemes. It would be necessary to assume a front [ṛ'] and [ḷ'] contrasting with a back [ṛ] and [ḷ], because the former later cause palatalization and the latter do not.

The vocalic allophones of /m n/ become [ę]. A complication is involved here because the [ę] from this source coalesced with the [ę] from PIE [em, en] and it is often very difficult to tell whether a form in [ę] derives from the reduced grade [ṃ, ṇ], or the normal grade [em, en]. Some examples that seem to derive from reduced grade are :

PIE /n/ [ṇ] > [ę]

OB. *devętŭ* 'ninth', Gk. *énatos*, Lith. *deviñtas*, R. /djivjátay/

PIE /m/ [m̥] > [ę]

OB. *desętĭ* 'ten', Lith. *dešim˜t*, Gk. *déka* Skt. *daśa*, Eng. *ten*, R. /djesjitj/

There is some conflicting evidence that indicates that the vocalic allophones of /m, n/ develop into [ĭ] or [ŭ], although it is not clear whether this is a regular development or not, and if it is, under what conditions the reflex is [ę] and under what conditions [ĭ] or [ŭ].

PIE/m/ [m̥] > [ŭ]

OB. *sŭto* 'hundred', Skt. *śata*, Gk. *h-ékaton*, Goth *hunds*, Lith. *šim˜tas*, Eng. *hundred*, R. /sto/ (all from [m̥]).

PIE /n/ [n̥] > [ĭ, u]

Pre-Sl. */yĭmę/ (from **n̥men?*) 'name', Lat. *nōmen*, Skt. *nāma*, OB. *imę* (phonemically/yəmę/), R. /ímji/.

OB. *vŭn* 'in' (from [n̥]?), Lat. *in*, R. /v/.

3.7 *Palatalizations*

A series of palatalizations took place which completely changed the structure of the language. There are four separate palatalizations which may be termed front-vowel palatalization, *y*-palatalization, æ-palatalization and palatalization by preceding front vowel respectively. Sometimes these developments are given numbers in which case front-vowel palatalization is called the first palatalization and æ- palatalization is called the second and the other two are not given any number. To avoid this problem the mnemonic titles used above are more useful. A number of other developments involving mainly the vowels must be placed chronologically between some of these palatalizations and are thus discussed in this section also.

3.7.1 *Front-vowel palatalization*

All consonants except /y/ occurring in position before

any of the front vowels, /i, ī, e, æ, ę/ are palatalized. The specific results are as follows :

p b m v	become	*pj bj mj vj* †
t d s z	,,	*tj dj sj zj*
l n r	,,	*lj nj rj*
k g x	,,	*čj žj šj*

It is customary to state that under these conditions [k, g, x] become [č, ž, š] respectively, but it is not always customary to state that the other consonants become palatalized. Since later these consonants show up as palatalized under these conditions, it is assumed here that the palatalization must have taken effect when this palatalization was operative in the case of /k, g, x/. VAILLANT, *GrComp.* 45, says of this palatalization, 'mais les consonnes des deux séries ne constituent pas des phonèmes distincts, puisque leur point d'articulation reste le même et que leur prononciation dure ou molle est liée à celle de la voyelle qui suit.' The point of articulation is not pertinent, but the second point is, although it should be stated in a different way. The really significant point at this stage of development is that both front and back vowels may occur after /y/, and for this reason the difference between front vowel and back vowel must be considered phonemic and it is therefore necessary to consider the contrast of plain consonant versus palatalized consonant non-significant or dependent on the following vowel. The palatalized versions of [p, b, m, v, t, d, s, z, l, n, r] and the non-palatalized versions are allophones of the same phoneme. Likewise, at this stage [k] and [č], [g] and [ž], [x] and [š], are allophones of the same phoneme. This phonetic change is, then, not a phonemic change. The phonological system

† The symbols pj etc. are here considerd to represent unitary phonemes, cf. 3, 7, 2, and are employed only from typographical necessity.

is still one of a contrast between a front vowel and a back vowel, and the contrast between palatalization of consonant and lack of it is not phonemic. Each consonant may occur before each vowel; each consonant except /y/ has a palatalized allophone before a front vowel. The general effect of this change is to produce a distribution of consonant plus vowel in which a palatalized consonant is followed by a front vowel and a non-palatalized consonant is followed by a back vowel. It is only the distribution of /y/ which does not conform to this system.

It is probably to be assumed that it is at this time that the front vowels in initial position develop a [y] in front of them, i.e., [i] > [yi], [ĭ] > [yĭ], [e] > [ye], [æ] > [yæ], [ę] > [yę]. It is possible to assume that in PIE the laryngeal, or laryngeals, occurred in initial position and that no vowel occurred in initial position not preceded by some consonant. If this assumption is made, then when other consonants are palatalized before a front vowel, the laryngeal is also palatalized in this position and results in [y]. The alternative statement is to assume that the laryngeal was lost early in this position and that when front vowels caused palatalization of preceding consonants they developed a [y] in front of them when they occurred in initial position. Regardless of which way the statement is made, the result is the same : no front vowels may occur in initial position.

Before some of the back vowels in initial position a [v] develops, although not as consistently as a [y] before initial front vowels. Before [ŭ] and [i] a [v] seems to develop regularly, thus Pre-Sl. **vŭn* 'in', OB. *vŭn*, from an earlier **ŭn*, and OB. *vyknŏti* 'to learn' from an earlier **iknǫti* from **u:k-*. Before [o, ǫ] there are sporadic examples with a prothetic [v], but the development is not regular : OB. *osmĭ* 'eight', but R. /vósjim/; R. /aná/ 'she' but Uk. /voná/; R. /úskiy/ 'narrow' but Pol. *wąski*. Before initial [u] no prothetic consonant develops : OB.

učiti 'to teach', R. /učítj/. Initial [a] will be discussed in section 2.7.2.

From these developments it may be assumed that front vowels develop a feature of palatalization and back vowels a feature of labialization. That palatalization is a significant feature and labialization non-significant may be assumed from the regular nature of the prothetic [y] and the regular development of palatalized consonants and the sporadic nature of the prothetic [v]. Labialization of consonants never develops into a regular feature of the Slavic languages although there are sporadic traces of it up to the present, e. g. all consonants before the phoneme /o/ in modern Russian are quite strongly labialized.

Examples of the palatalization of PIE [k], [g] and [x] are :

[k] > [č]

OB. *česati* 'to comb', but *kosa* 'braid'

OB. *črŭnŭ* (from earlier **čirnŭ*), but Skt. *kṛṣṇas* 'black'

[g] > [ž]

OB. *živŭ* 'alive', Lat. *vīvus*, Gk. *bíos*, Eng. *quick*

OB. *ženǫ* 'I chase', but *gŭnati* 'to chase'

[x] > [š]

OB. *uši* 'ear' (pl.), but *uxo* (sg.)

OB. *slyšati* 'to hear' (from earlier **slixæti*), but *sluxŭ*.

3.7.2. *Effect of /y/ on following vowel*

The back vowels [o, ŭ, u, i, oy] when preceded by /y/ are fronted to produce respectively [e, ĭ, ü, i, i] and the front vowel[æ] when preceded by /y/ or by [č, ž, š] is backed to produce [a] The general effect of front vowel palatalization was to establish a system in which a non-

palatal consonant was followed by a back vowel nad a palatal consonant by a front vowel. The exception was the consonant /y/ which could be followed by either a front vowel or a back vowel. The general effect of this new change is to make the vowels after /y/ conform to the rest of the system. After /y/ the front vowels [e, ĭ, ü, i] occur but not the corresponding back vowels, and the back vowel [a] but not the corresponding front vowel. The system is not perfectly symmetrical, but is consistent in that there is no longer a contrast between a specific back vowel and its corresponding front vowel in position after /y/.

In initial position there is some problem with respect to the development of initial PIE [e:] which should give [æ] and then [yæ] and then [ya], of PIE initial [a:] or [o:] which should give [a] and PIE initial [ya:] and [yo:] which should give [ya]. In the first place initial *[a:] sometimes shows a prothetic [y] and sometimes does not : OB. *a* 'but', Lith. *o*, Skt. *āt*; but OB. *aviti*, *javiti* 'appear', R. /jávjitj/, Skt. *āvíṣ* 'openly'. Also forms with Pre-Sl. *[ya:] show differing forms in the modern languages, thus Skt. *yāti* 'he goes', Bg. *jáham*, SCr. *jàhati*, Pol. *jać*, but R. /yéxat,/, /yézjdjitj/, Pol. *jez'dzić*, SCr. *jèzditi*. There are very few forms that should have an initial *[æ] > [ya]; the best attested is the verb 'to eat' which quite consistently shows forms which should not derive from Pre-Sl. [ya] ; SCr. *jedem*, Pol. *jem*, R. /yem/, but Bg. *jam*. Since this problem involves word boundaries and since there is reason to assume the occurrence in Slavic of an open juncture (cf. # 3.8.2), a possible explanation is that all of these forms should give [ya] after open juncture, but [æ] after close juncture, which with analogical developments in the individual Slavic languages has produced the inconsistencies noted above.

At this stage the distribution of consonant plus following vowel may be stated as follows :

After	may occur	After	may occur
p b m v	*o ɨ ŭ a u ǫ oy*	*pj bj mj vj*	*e i ĭ æ – ę –*
t d s z	*o ɨ ŭ a u ǫ oy*	*tj dj sj zj*	*e i ĭ æ – ę –*
l n r	„	*lj nj rj*	„
k g x	„	*č ž š*	*e i ĭ a – ę –*
		y	*e i ĭ a ü ę–*

In initial position only [o a u ǫ] could occur. In final position consonants had been lost by this time (cf. # 3.8.1), so that no contrast between palatalized consonants was possible in final position. These particular phonetic changes produce rather far-reaching effects on the phonetic system. In the first place the change of [æ] to [a] after [y č ž š] produces a contrast between [ka] and [ča], [ga] and [ža], [xa] and [ša], which causes the phonemes /k g x/ to split into /k g x/ and /č ž š/. The palatalized versions of the labials, dentals and resonants are in complementary distribution with the non-palatalized versions. The front oral vowels nowhere contrast with the corresponding back oral vowels. For these reasons, and because [k g x] and [č ž š] must be considered separate phonemes, it is possible to consider the feature of palatalization as significant and the vowel feature of frontness as non-significant. This implies the following analysis of the consonants : /p b m v t d s z l n r k g x/ as non-palatalized phonemes and /pj bj mj vj tj dj sj zj lj nj rj čžš/ as palatalized phonemes. The oral vowel phonemes would be five in number, each with two allophones, as follows :

/a/ [a] and [æ]
/o/ [o] and [e]
/ə/ [ŭ] and [ĭ]
/i/ [i] and [ɨ]
/u/ [u] and [ü]

There would also be an unpaired palatalized phoneme /y/. The allophonic distribution would in general be front allophones after palatalized consonants and back allophones

after non-palatal consonants, but with the exception that the back allophone of /a/ occurs after the palatal consonants /č ž š y/. The phonemic distribution would be fairly symmetrical, but not entirely so. The vowel phonemes /o i ə a/ would occur after any of the consonant phonemes, but /u/ would occur only after the non-palatal consonants and /y/. The nasal vowels [ę] and [ǫ] are in contrast in position after /y/ and must be considered separate phonemes /ę/ and /ǫ/, although in all other positions they are in complementary distribution. This means that they both have a defective distribution, /ę/ occurring only after palatal consonants and /ǫ/ only after non-palatal consonants and /y/.

It would also be possible to consider the feature of frontness of vowels as significant and the feature of palatalization of consonants non-significant. If this is done, then there would be nine oral vowel phonemes, /a æ o e i ĭ ŭ ĭ u/ and two nasal vowel phonemes, /ę ǫ/. The phones [u] and [ü] are in complementary distribution and may be considered allophones of the same phoneme /u/. This would reduce the number of consonant phonemes from 27 to 18 : /p b m v t d s z l n r k g x č ž š y/. It would still be necessary to consider both /k g x/ and /č ž š/ as phonemes because of their contrast before [a]. This system is mutually convertible with the other system, i. e., it is predicated on the same data, and is therefore also possible. This system has the advantage of having fewer phonemes, but the disadvantage of an even more lop-sided distribution. The phonemes /k g x/ can occur before only six of the eleven vowel phonemes, /č ž š/ before only five of the eleven vowels and, of these five, four are different from the six that occur after /k g x/ and lastly the phoneme /y/ can occur before only seven of the eleven vowels.

Another possible analysis, that of George L. Trager[5], is partially based on the same assumption as the five-vowel

analysis, i.e., that the difference between front and back vowels is not significant. It further considers hte /o/ of the five vowel analysis, which derives from the PIE short lower vowels, as a low vowel /ə/, and the /ə/ of the five vowel analysis, which derives from PIE short high vowels, as a higher vowel /i/. It considers the /i/ of the five vowels, as the higher vowel plus a front offglide, /iy/, the /u/ of the five vowel analysis, which derives from the lower vowels, analysis, which derives from PIE short high vowels, plus a /w/, as the lower vowel plus /w/, /əw/, and the /a/ of the five vowel analysis, which derives from the long lower vowels of PIE, as a long vowel, specifically, /əh/. As mentioned before, it is not possible to consider both length and quality as significant features as is sometimes done in traditional writing on this subject, but this analysis which takes length into consideration considers the quality differences non-significant. This analysis has all the advantages of a more regular distribution that the five vowel analysis has. Further, it has the advantage that instead of saying that PIE/aw, ow/ develops into /u/ in tautosyllabic position and /ov/ in heterosyllabic position, it may be said that /aw, ow/ develops into /əw/ in all positions. Likewise, instead of saying that PIE /ey/ develops into /r-,i/ in tautosyllabic position and into /r-,iy/ in heterosyllabic position, it may be said that /ey/ develops into /jiy/ in all positions. For either the five vowel or the two vowel analysis the feature of palatalization of consonants and frontness of vowels may be extracted and analyzed as /j/, atthough this analysis is not necessarily implied by the use of /j/ in this text.

In this paper the five vowel analysis is preferred to the nine vowel analysis partly because of the distributional defects in the latter, and partly because the five vowel analysis considers the palatalization of the consonants, the development of vowels after /y/ and the development of /y/ before initial front vowels as a single unitary phonetic

development, which may be stated as the loss of the contrast of back vowel versus front vowel. This applies to all the oral vowels and leaves only the nasal vowels irregular from this point of view. The significant feature of this stage of the language is that all three analyses are possible. At a later stage the two vowel analysis is no longer possible while both the five and nine vowel analyses are still possible, and then later still the nine vowel analysis is no longer possible while the five vowel analysis is. For this very arbitrary reason the five vowel analysis is adopted in this text, giving it preference in writing a consecutive history of the phonology of the language to both the two vowel analysis as well as to the nine vowel one.
Examples of these changes are :

/p b m v/ > /pj bj mj vj/

/pętĭ/ > /pjętjə/, OB. *pętĭ* 'five'
/berǫ/ > /bjorǫ/, OB. *berǫ* 'I carry'
/vedǫ/ > /vjodǫ/, OB. *vedǫ* 'I lead'
/melyǫ/ > /mjolyǫ/, OB. *meljǫ* 'I grind'

/t d s z/ > /tj dj sj zj/

/tĭnŭkŭ/ > /tjənəkə/, OB. *tĭnŭkŭ* 'thin'
/desętĭ/ > /djosjętjə/, OB. *desętĭ* 'ten'
/zemya/ > /zjomya/, OB. *zemlya* 'land'

/l n r/ > /lj nj rj/

/beretĭ/ > /bjorjotjə/, OB. *beretŭ* 'he carries'
/elenĭ/ > /yoljonjə/, OB. *jelenĭ* 'dear'

/k g x/ > /č ž š/

/peketĭ/ > /pjočotjə/, OB. *pečetŭ* 'he bakes'
/mogetĭ/ > /možotjə/, OB. *možetŭ* 'he can'
/duxe/ > /dušə/, OB. *duše*, voc. sg. of *duxŭ* 'spirit'

/a/ and /æ/ > /a/

/dati/ > /datji/, OB. *dati* 'to give'
/dæti/ > /djatji/, OB. *dĕti* 'to lay'

/o/ and /e/ > /o/

/domŭ/ > /domə/, OB. *domŭ* 'house'
/desętĭ/ > /djosjętjə/, OB. *desętĭ* 'ten'

/ĭ/ and /ŭ/ > /ə/

/mĭgla/ > /mjəgla/, OB. *mĭgla* 'fog'
/domŭ/ > /domə/, OB. *domŭ* 'house'

/i/ and /i/ > /i/

/dimŭ/ > /dimə/, OB. *dymŭ* 'smoke'
/divo/ > /djivo/, OB. *divo* 'wonder'

/u/ and /ü/ > /u/

/yünŭ/ > /yunə/, OB. *junŭ* 'young'
/duxŭ/ > /duxə/, OB. *duxŭ* 'breath'

/yoy/ > /yi/

loc. pl. morpheme, /krayix/ (from **yoy*) 'border', but OB. *vlĭčьxŭ* (from **oy*) 'wolf'

[yo] > [ye]

/moryo/ > [morye] /moryo/, OB. *morje* 'sea'

[yŭ] > [yĭ]

nom. sg. morpheme, /krayŭ/ > [krayĭ] /krayə/, OB. *krai* [krayĭ], but *vlĭkŭ*.

[yi] > [yi]

inst. pl. morpheme, /krayi/ > [krayi] /krayi/, OB. *krai* [krayi], but *vlĭky* [vlĭki]

3.7.3 *y-palatalization*

All consonants in position before /y/ become palatalized. It should be noted that /č ž š/ cannot occur in this position since their only source is from earlier /k g x/ before front vowels. The specific results, in some cases identical with front vowel palatalization and in other cases different, are :

p b m v	before	*y*	become	*pjljy bjljy mjljy vjljy*
t d s z	„	*y*	„	*tjy djy š ž*
l n r	„	*y*	„	*ljy njy rjy*
k g x	„	*y*	„	*č ž š*

The cluster [kt] occurring before a front vowel falls together with [ty] to produce [tjy]. In all cases it is assumed that the consonant is palatalized and that this resultant consonant is to be identified phonemically with the palatalized phonemes. The basis for this assumption is that at a later date when the /y/ is lost the result is a palatalized consonant and it is reasonable to assume that *y*-palatalization operated simultaneously in the case of the velars and the other consonants.

In the case of the labials, all the Slavic languages show forms with an [l] in initial clusters: */pljjyuyǫ/ 'I spit', OB. *pljujǫ*, Bg. *pljúja* SCr. *pljujem*, Slov. *pljújem*, Mac. *pluje*, R. /pjljuyú/, Pol. *pluję*, Cz. *pliji*. In medial position some have [l] and some do not: */zjomjljya/ 'land', OB. *zemlja*, Bg. *zemjá*, SCr. *zemlja*, Slov. *zémlja*, R. /zjimjljá/, Pol. *ziemîa*, Cz. *země*, Mac. *zemja*. The interpretation of VAILLANT, *GrComp.* 68–9, is followed here in assuming that the loss of the [l] occurred later in those languages that do not show it, rather than that it developed separately in the various languages that do not have it. Phonemically /py by my vy/ become /pjljy bjljy mjljy vjljy/. This does not introduce any new phonemes into the language or change the distribution.

Examples of this change are:

zjemya /zjomya/ > *zjemjljya* /zjomjljya/, OB. *zemlja* 'land'
kupyǫ /kupyǫ/ > *kupjljǫ* /kupjljǫ/, OB. *kupljǫ* 'I buy'

VAILLANT assumes that the development of /vjljy/ is more recent. He states, *GrComp.* 68, that forms such as /stavjitji, stayjljyǫ/ 'stand' develop by analogy with forms like /kupjitji, kupjljyǫ/. The form /av/ before /y/ can not have developed by regular phonetic change, since in this

position we should have /u/ as is shown by forms such as OB. *věrovati věrujǫ*. VAILLANT may very well be right about this matter, but it is also possible that the analogical development /stavjiti, stavyǫ/ took place before *y*-palatalization and then developed into /stavjǰyǫ/ at the same time as the other *y*-palatalizations of the labials. VAILLANT, *GrComp.* 70, also assumes that /y/ when followed by [ĭ] or [i], which do not derive from [ŭ] and [u:], does not cause palatalization. This would require a much more complicated description of the development since it would be necessary to distinguish the development of /yĭ/ from that of /yŭ/. VAN WIJK, *GAS* 71–3, does not find it necessary to assume this development and this paper follows VAN WIJK in this case.

The phonemes /t/ and /d/ when followed by /y/ undergo palatalization to produce /tjy/ and /djy/. It is not possible to determine the precise phonetic result of this palatalization, but it is clear that these reflexes must not have coincided with any other phonemes or group of phonemes, because later in South Slavic they develop into a new set of phonemes, in West Slavic they coincide with one set of phonemes and in East Slavic they coincide with a different set of phonemes. The symbolization /tjy/ and /djy/ simply indicates that they are distinct phonemically from all other phonemes and groups of phonemes at this time.

svjætya /svjatya/ > *svjætjya* /svjatjya/ 'light', OB. *svěšta*, Bg. *svešt*, Mac. *svek'a*, SCr. *svijèća* R. /sjvjičá/, Pol. *świeca*, Cz. *svíce*.

mjedya /mjodya/ > *mjedjya* /mjodjya/ 'limit', OB. /*meždа*/ Bg. *meždu*, Mac. *meg'u*, SCr. *mèda*, R. /mežá/ (R. /mjéždu/ is a borrowing from OB), Pol. *miedza*, Cz. *meze*.

The phonemes /s/ and /z/ when followed by /y/ are palatalized and coalesce with the phonemes /š/ and /ž/ which had resulted from /x/ and /g/ before front vowels.

Examples are :

/pjisyǫ/ > /pjišǫ/ 'I write', OB. *pišǫ*
/ljizyǫ/ > /ljižǫ/ 'I lick', OB. *ližǫ*

The phonemes /l n r/ when followed by /y/ are palatalized to result in /ljy njy rjy/ which are kept distinct from the /lj nj rj/ which had resulted from front palatalization. Examples are :

/kolyǫ/ > /koljyǫ/, OB. *koljǫ* 'I split', R./kaljú/
/konyə/ > konjyə/, OB. *konĭ* / konjyə/ 'horse', R. /kon,/
/moryo/ > /morjyo/, OB. *morje* 'sea', R. /mórji/

The phonemes /k g x/ when followed by /y/ develop into /č ž š/ coalescing with the /č ž š/ that had developed from front vowel palatalization and the /š ž/ that had developed from the combinations /sy zy/. Examples are :

/plakyotjə/ > /plačotjə/ 'he cries', OB. *plačetŭ*, R. /pláčit/
/bjagyǫ/ > /bjažǫ/ 'I run', OB. *běžǫ*, R. /bjižú/
/səxyǫ/ > /səšǫ/ 'I dry', OB. *sŭšǫ*

The phoneme /u/ had occurred previously only after nonpalatal consonants and /y/. Now it may occur after /č ž š/ : /syuyə/ > /šuyə/ 'left', OB. *šui*; /kyutji/ > /čutji/ 'to perceive', OB. *čuti*. The phoneme /u/ may still not occur after other palatal consonants. The phoneme /o/ may now occur after /č ž š/ : /pisyǫ/ > /pišǫ/ 'I write'. The resultant distribution of vowels is the following :

After	may occur	After	may occur
p b m v	*o i ŭ a u ǫ oy*	*pj bj mj vj*	*e i ĭ æ – ę*
t d s z	,,	*tj dj sj zj*	,,
l n r	,,	*lj nj rj*	,,
k g x	,,	*č ž š y*	*e i ĭ a ü ę ǫ*

The main effect of the new distribution is that the contrast between the nasals /ę/ and /ǫ/ now carries a heavier

functional load, since they now contrast after /č ž š y/ instead of only after /y/.

3.7.4 æ – *palatalization*

The diphthong [oy] becomes [æ], falling together with earlier [æ], or it becomes [i], falling together with earlier [i]. The exact conditions under which these developments take place are not clear, but in medial position [oy] always becomes [æ] and in final position it sometimes becomes [æ] and sometimes [i]. VONDRAK, *S Gr.* 58–63, says that final [oy] became [i] under a falling tone and [æ] under a rising tone, although there are exceptions.

All consonants that may occur before these new front vowels are palatalized. The phonemes /č ž š y/ could not occur before these vowels. The specific results of this palatalization are :

p b m v before new [æ] and [i]	become	*pj bj mj vj*
t d s z	,,	*tj dj sj z*
l n r	,,	*lj nj rj*
k g x	,,	*c ʒ ś*

The phonemic result of these changes is to lose /oy/ as a diphthong and to introduce three new phonemes into the language, /c ʒ ś/.

/oy/ > /a/ [æ]

/loyvə/ > [ljævŭ] /ljavə/ 'left', Lat. *laevus*, R. /ljévay/

/voydjatji/ > [vjædjætji] /vadaitj/ 'to know', OB. *vědĕti*. loc. sg. morpheme, /rabja/ from /raboy/, but in *yo*–stems, /konjyi/ from /konyoy/ (cf. # 3.7.2).

/oy/ > /i/

/raboy/ > /rabji/, n. pl. of /rabə/ 'slave'

/njosoy/ > /njosji/, 2 sg. imper. of /nosjtji/ 'to lead'

This change is found regularly in the nom. pl. of *o*–stem nouns like the one above, but is not to be confused with the /i/ in the nom. pl. of *yo*–stem nouns which derives

from /yoy/, e. g. /duśi/ from /duxyoy/. It is also found in the 2 sg. imper. of *o*-stem verbs like the one above, although the 2 pl. imper. has [æ] from /oy/: [njesjætje] /njosjatjo/. Again this /i/ should not be confused with the /i/ in the imper., both 2 sg. and 2 pl., of *yo*-stem verbs: /pjiši/ and /pjišitjo/ with /i/ from /yoy/.

/koy/ > /ca/ or /ci/
loc. sg. /loca/ and nom. pl. /loci/ from /lokə/ 'ray'
/goy/ > /ʒa/ or /ʒi/
/roʒa/, loc. sg. and /roʒi/ nom. pl. from /rogə/ 'horn'
/xoy/ > /śa/ or /śi/
/duśa/ loc. sg. and /duśi/ nom. pl. from /duxə/ 'spirit'

The assumption that /k/ develops into /c/ under these conditions and that /g/ develops into /ʒ/ is customary in all the handbooks, but the assumption that /x/ becomes /ś/ is not so frequent. It is necessary to assume that /x/ develops into a phoneme that is distinct from the phonemes /š/ and /s,/ because later in West Slavic it coalesces with /š/ and in East and South Slavic with /s,/, and so this phoneme is symbolized as /ś/. (cf. # 4.1.1).

This palatalization produces the following distribution of vowels:

After	many occur	After	may occur
p b m v	*o i ŭ a u ǫ*	*pj bj mj vj*	*e i ĭ æ – ę*
t d s z	,,	*tj dj sj zj*	,,
l n r	,,	*lj nj rj*	,,
k g x	,,	*č ž š y*	*e i ĭ a ü ę ǫ*
		c ʒ ś	*– i – æ – – –*

This gives the same vowel phonemes as before, five oral vowels, /u i ə o a/, and two nasal vowels, /ę ǫ/, and adds /c ʒ ś/ to the inventory of palatal consonant phonemes. If the nine oral vowel analysis is used, it should be noted that [k g x] would be in complementary distribution with

[c ʒ š] and both would be allophones of the phonemes /k g x/.

3.7.5 *Palatalization by preceding front vowels*

The phones [k g x] become [c ʒ ś], but the exact conditions under which this development takes place are under dispute. The main point of agreement is that it takes place after [i ĭ ę] : [otjĭcĭ] 'father' from *[otjĭkŭ], [njicĭ] 'down' from *[njikŭ], and [mjæsjęcĭ] 'month' from *[mjæsjękŭ]. There is some evidence that it takes place after [i] from PIE /i :/ and not after [i] from PIE /ey/ (cf. VAILLANT, *GrComp.* 53) : [njicĭ], Skt. *nīca-* 'low', but [ljixŭ] 'excess' from **leykso-*. If this is realy so, then the reflexes of PIE /i :/ and /ey/ must have remained distinct until after this palatalization, a condition that it is simpler not to accept without more evidence. There is evidence that [ŭ] and [i], when following the velar, inhibited the change (BELIĆ, *RES* 8. 50-67) : [poljĭʒa] 'use' but [ljĭgŭkŭ]; 'light' [kunjęʒĭ] but [kŭnjęginyi]. If this is true, then PIE final [-os, -om], must not have developed into [-ĭĭ] at the time of this palatalization because in [ot,ĭcĭ] from *[otjĭkŭ] the [ŭ] from [os] does not inhibit the change. Others have considered other following vowels as inhibiting this change. The conditions remain rather obscure, and any interpretation must treat certain developments as analogical. The phones [c ʒ ś] resulting from this palatalization coalesce with the phones [c ʒ ś] resulting from æ–palatalization.

The forms that are affected mostly by this palatalization are certain noun and adjective forms and some iterative verb infinitives. Since the nouns have the same endings as the *yo*–stem and *ya*–stem nouns, it is probably simpler to assume that these endings are adopted by analogy, than to assume that a shift of vowels took place after the new /c ʒ ś/. This is confirmed by the fact that it seems necessary to make this assumption of analogy in one

form. The nom. sg. of feminine nouns of this type have [a] after the new [c], e. g. [ubiica] 'murder' just as do *ya*-stem nouns like [duša] 'spirit'. If this form had developed by phonetic change involving the development of front allophones after [c ʒ ś], [æ] rather than [a] would be expected, or if it had developed the allophones that already occur after [c ʒ ś] from æ-palatalization, it would also have [æ] just as the loc. sg. of [rokŭ] is [rocæ]. It would seem then that [a] occurs after the new [c ʒ ś] by analogy. There is still other confirmation of this thesis. In OB. the forms [otĭcixŭ] and [stĭʒaxŭ] (in glagolitic documents [stĭʒěxŭ]) occur. These forms show the phonology of *yo*-stems and *ya*-stems respectively. However, the form [vĭsěxŭ] which should represent an earlier *[vĭśæxŭ] also occurs. It is difficult to see by what sort of analogy this form could have developed, but if it is assumed that it represents the regular phonetic development, the others arise by analogy with *yo*-stem and *ya*-stem forms. In summary then, after the new [c ʒ ś] the front allophones [i ĭ ę ü] are expected and these are what occur, but the front allophone [æ] would also be expected but both [æ] and [a] occur, the first being regular and the second arising by analogy with *yo*-stem and *ya*-stem forms. Furthermore, both [ę] and [ǫ] are expected after these consonants, and both occur in this position.

The resultant distribution of vowels after consonants is:

After	may occur	After	may occur
p b m v	*o i ŭ a u ǫ*	*pj bj mj vj*	*e i ĭ æ – ę*
t d s z	„	*tj dj sj zj*	„
l n r	„	*lj nj rj*	„
k g x	„	*č ž š y*	*e i ĭ a ü ę ǫ*
		c ʒ ś	*e i ĭ a u ę ǫ æ*

The vowels [a] and [æ] now contrast in position after [c ʒ ś] which may be interpreted phonemically in two

different ways. A palatalized versus a non-palatalized [c ʒ ś] may be posited conforming to the previous analysis. Or two vowels, /a/ and /æ/, may be posited. Because of subsequent developments, it is simpler to assume two vowel phonemes, which implies that when this last palatalization takes place followed by the analogical development of vowels just discussed, the phoneme /a/ is split into two phonemes, /a/ and /æ/ although these phonemes contrast only in position after /c ʒ ś/. This results in a six oral vowel system.

In the alternate phonemic interpretation with nine oral vowels, there would be no change in the inventory of vowel phonemes, but there would be a slight change in the distribution. TRAGER's system with two oral vowels does not take into account the contrast of [a] and [æ]. From this point of view, TRAGER's analysis represents a stage of Pre-Slavic rather than Proto-Slavic. To make TRAGER's analysis account for the contrast of [a] and [æ] after /c, ʒ, ś/, the result would be that the combinations /cjəh/ and /cəh/ would occur, but in all other possible combinations there would always be a /j/, thus: /cjɨy, cjəw, cji, cjə/ where /c/ here represents /c/, /ʒ/ or /ś/. These are the last changes that must be assumed for all the Slavic languages, so the phonemic analysis presented at this stage is that of Proto-Slavic.

3.8 *Finals*

Final vowels and consonants are treated separately partly because they show special developments which would unnecessarily complicate the earlier statements. On the other hand, they do not show any developments which would require changing the earlier interpretation of the structure of the language as did the initial vowels, and so they have been left until now.

3.8.1 *Final consonants*

Final consonants of PIE are lost in Slavic: OB. *nesi*

imper. from PIE *-oys*, Skt. *bhares*, Gk. *phérois*; OB. *raba* gen. sg. from PIE abl. *-o:d*, Skt. *vṛkāt*; OB. *to* nom. acc. n. sg., PIE **tod*, Skt. *tad*, Gk. *to'*. Phonemically this affects the distribution of the consonants, but its only effect on the phonology is that words may now end only in vowels.

Forms in which the last vowel is followed by a nasal consonant or a cluster that includes a nasal will be discussed under final vowels (cf. # 3.8.3).

3.8.2 *Juncture*

There are some apparent exceptions to the loss of final consonants; several of the prepositions show forms with a final consonant. In OB. some of the prepositions, *bez* 'without', *vŭz* 'at the side of, up', *iz* 'outside of' and *raz* indicating separation, regularly occur with a final consonant, although they show sandhi forms, morphophonemic alternants, that indicate that the juncture between preposition and noun or between prefix and verb may have been closer than elsewhere: *bez mene* 'without me', *bes tebe* 'without you', *best traxa* 'without fear'. These forms may be interpreted phonemically with close juncture: /bjozmjonjo/, /bjostjobjo/ and /bjostraxa/, as opposed to other forms that are separated by open juncture. This interpretation of juncture would make the development of the prefixes and prepositions regular since they would no longer appear before pause. Some prefixes and prepositions occur with regularly alternating forms, one with final consonant and one or more without: *o, ob* 'around', *o, ot, otŭ* 'from', *vŭ, vŭn* 'in', *sŭ, sŭn* 'with, down from', etc. The distribution of these forms is phonologically conditioned: a form ending in a vowel occurs before a form beginning with a consonant, and vice-versa. This would also indicate close juncture between the prefix or preposition and the following form. The alternation of forms is much more common between prefix and verb or between preposition and pronoun than between preposition and

noun, although there are examples of the last : *vŭn čdra* 'in the breast'. This may indicate that at an earlier stage close juncture was regularly found in these cases, but that it was beginning to be replaced by open juncture between preposition and noun. This conclusion is supported by the fact that it is in these two positions, between prefix and verb or between preposition and pronoun, that reflexes are found in modern Russian of the previous existence of close juncture. In Russian the third person pronouns occur with an extra /n/ in front of them when preceded by a preposition : /yà yivó znáyu/ 'I know him', but /s njím/ 'with him' or/ ù njivó/ 'at him, he has'. This /n/ originally belonged morphemically with the preposition, but now belongs with the pronoun. The history would seem to be that earlier the preposition was followed by the pronoun in close juncture, later the juncture was opened up but mistakenly before the /n/, and /n/ was then analogically added to forms where it had not previously occurred, which is the present situation in Russian. A similar development may be traced for verb forms since some occur in modern Russian with an /n/ that originally is part of the prefix, /sjnját,/ 'to take off', some occur with the /n/ analogically extended, /panjátj/ 'to understand', and some have lost the /n/ analogically, /vaytjí/ but OB. *vŭniti*. It may be assumed then that in Proto-Slavic there was close juncture between preposition and noun or pronoun and between prefix and verb and that in the history of Russian there has been a tendency for these junctures to be opened except in the case of prefix plus verb.

3.8.3 *Final vowels*

Vowels in final position, with very few exceptions, develop the same way they do elsewhere. The exceptions are final /oy, ay, o:y/. Final /oy, ay/ (cf. # 3.7.4) become [æ] under some conditions and [ı] under other conditions. This has been discussed earlier because it affects the distri-

bution of consonants and vowels. Final /o:y/ may have developed into [u]. This seems to be the treatment of final /o:y/, Gk. *ōi*, in the dat. sg. of masc. *o*-stems: OB. *rabu* 'slave', Gk. *philōi* 'love'. Final /a:y/ develops regularly into [æ] in the dat. sg. of fem. *a*-stems, OB. *rocæ* 'arm', Gk. *philē*. VAILLANT uses this difference to prove that PIE [o:] and [a:] were kept distinct until quite late in Pre-Slavic. If this is so, then the chronology must be that final /o:y/ became /u/ and then later /o:y/ in other positions coalesced with /a:y/.

Vowels before a single consonant other than a nasal developed regularly with one exception, [o] before final [s]. This combination in final position developed into [ŭ], as in the nom. sg. of *o*-stems, OB. *rabŭ*. There is some evidence that there was another treatment of final [os], as in the nom. sg. of *s*-stems, OB, *nebo*, with [-o] from [-os], Gk. *génos*, Skt. *nábhas*. This development does not in any way change the phonemic structure posited above.

When a vowel is followed by a final nasal or a nasal plus [s], there are some irregular developments. Final [-om] becomes [-ŭ], OB. acc. sg. masc. *tŭ* 'this', Gk. *tón*, Skt. *tam*. (a form that might, however, be analogical); OB. *idŭ* 1 sg. aorist, Gk, *-a*, Skt. *-am* (a form that cannot very well be analogical). If this is the regular phonetic development, then the nom. acc. of neuter *o*-stems, OB. *lěto*, and possibly also of neuter *s*-stems, OB. *slovo*, may be an analogical extension of the [o] ending of the neuter pronoun, OB. *to*, Gk. *tó*, Skt. *tad*, PIE **tod*. The acc. sg. masc. of *jo*-stems shows a parallel development, [-yom] becomes [-yĭ], OB. *konjĭ*. Final [-im] and [-um] lose the final nasal and develop regularly into [-ĭ] and [-ŭ], OB. *pǫtĭ* and *synŭ*, as acc. forms from PIE [-im] and [-um] respectively, Skt. *agnim* and *śatrum*. Final [-o:m] and [-a:m] become [-o]: acc. sg. fem. of *a*-stems, OB. *rǫkǫ*, Skt. *-ām*; 1 pers. sg. pres. OB. *idǫ*, if this is from a re-formed 1 pers. sg. morph-

eme *[-o:m], resulting from a contamination of PIE [-o:] and [-mi]. Final [-e:n][6] becomes [ę] if the nom. acc. sg. of the neuter of *n*-stems shows the regular phonetic development : OB. *sěmę* 'seed', although Lat. *sēmen*, Gk. *ónoma*, Skt. *nāma* indicate a PIE form in [n̥], the vocalic allophone of /n/, and the Slavic form may also derive from the same form. (cf. # 3.6). The acc. sg. fem. of *ya*-stems in [-yǫ] may be a regular development or it may be an analogical formation replacing an earlier [-yę]. The final combinations, [-ons] and [-a:ns] both become [-i]: acc. pl. of *o*-stems, OB. *bogy* /bogi/ 'gods', Skt. *devāns* (in sandhi form), Goth. *-ans* all from *[-ons]; acc. pl. of fem. *a*-stems, OB. *roky* from *[-a:ns]. If [-ǫ] is the regular development of [-o:n] and [-i] is the regular development of [-o:ns], then OB. *kamy* 'stone' must be derived from the latter, although this does not agree with other IE languages, Gk. *kheimō'n*, Lat. *pulmō*, Skt. *áśmā*. The development of final [-yons] and [-ya:ns] is problematical; they both show the same reflex, but the various branches of Slavic do not agree in the shape of this reflex : South Slavic shows [-ę], and both West and East Slavic show [-ě], i. e., [-,æ]. The final combination [-ont] gives [ǫ] : 3 pl. aorist, OB. *idǫ* 'they went', Gk. *-on*, Skt. *-an*, all from *[-ont].

3.9 *Consonant clusters*

Consonant clusters composed of stop plus stop show evidence of losing the first member of the cluster. There is evidence that [pt] becomes [t] : OB. *počrŭpo*, infin. *počrěti* (from earlier *čerpti), Lith. *kir˜pti*, Lat. *carpō*. There is also evidence that [pt] becomes [st] : OB. *stryi* (from *strŭyĭ), Skt. *pitṛvyas*, Lat. *patruus*, which might represent a development earlier than the formation of infinitives in [-ti]. The cluster [bd] becomes [d] parallelling the development of [pt] : OB. *sedmŭ* 'seventh', *sedmĭ* 'seven' (from earlier **sebd-mo-*), Gk. *hébdomos*, Skt. *sapta*.-

There is evidence that [kt] becomes [t] : OB. *setĭnŭ* 'last' (from **sek-to-*, from the root **sek*^{w}-), Lat. *sequī* 'follow'. The cluster [kt] when followed by a front vowel undergoes palatalization to fall together with the reflex of [ty] (cf. # 3.7.3) : OB. *nošti*, PSl./notjyə/ 'night', Lat. *noctem*. The numeral 'five', OB. *pętĭ*, which also derives from [kt] before a front vowel, is presumably an analogical formation from [pętŭ] 'fifth', Lith. *peñktas*, Gk. *pemptós* where the cluster does not occur before a front vowel.

In clusters with [s] as second member and a stop as first member, the stop is lost : OB. *osa* 'wasp', Lith. *vapsà*, OHG. *wafsa*, Lat. *vespa*; OB. *bljudǫ* 'I observe', Aor. *sŭblusŭ* (from [ts] from [ds]). This change must have been subsequent to the change [s] becomes [x] after [i u] since this [s] is retained unchanged. The combination [ks] becomes [x] unless followed by another consonant, thus OB. *rekǫ* 'I will say', but Aor. 1 sg. *rěxŭ*, 3 pl. *rěšę* ([x] > [š] by front vowel palatalization) and 2 pl. *rěste*. The cluster [k̑s] seems to produce [s] which does not show alternate forms in [x] and [š] : OB. *osĭ* 'axis', Lith. *ašìs*, OHG. *ahsa*; 1 sg. aorist OB. *nĕsŭ* (from **ne:k̑su*). Another cluster seems to be present in some forms which are derived by Vaillant, *GrComp.* 84–5, and by Vondrak, *VSG* 358, from [k̑s)], but by Pokorny, *IEW* 626, from [k̑0]. This includes OB. *tesati*, Lith. *tašy'ti*, Skt. *takṣati*, Gk. *téktōn* Lehmann, *PIEP* 99–100, posits for this cluster [kt], although this would conflict with [kt] in OB. *pętŭ* 'fifth' from **penktos*. A similar cluster for which Pokorny, *IEW* 414–6, posits [ĝ'h∂], and Lehmann, *PIEP* 99–100, posits [gdh], appears in PSl. as [z] : OB. *zemlja* 'earth', Skt. *kṣam*, Gk. *khthō'n*, Lat. *humus*. The cluster [rs] becomes [rx] (cf. # 3.5), OB. *praxŭ* 'dust' from the earlier **porxŭ*, and the cluster [ls] remains, OB. *glasŭ* 'voice' from PSl. **[golsŭ]*, Lat. *gallus* (from **galsos*). After the nasal consonants the [s] is retained : OB. *męso* 'meat' Goth. *mimz*, Skt. *māṃsam*; OB. *gǫsĭ*, 'goose', Ger. *Gans*, Skt. *haṁsas*.

Clusters with [s] as the first element are normally retained, although the cluster [sr] develops a svarabhaktic [t] to produce [str]. Examples are :

[sp] remains : OB. *spěti*, ' progress ', Lith. *spéti*, OHG. *spuon*.

[st] remains : OB. *stati* ' to stand ', Gk. *hi'stēmi*, Lat. *stāre*.

[sk] remains : OB. *iskati* ' to seek ', Lith. *jéškoti*, OHG. *eiscōn*, Skt. *icchati*.

[sḱ] > [s]: OB. *pasǫ*, *pasti* ' to graze', Lat. *pāsco*.

There is some doubt about these last two since the suffix in the first should be [sḱ] and not [sk], which VONDRAK assumes, and this would give two different reflexes for sḱ. Vaillant assumes that the regular reflex of [sḱ] is [sk], whereas the regular reflex of [ḱ] is [s], thereby explaining the alternation of R./klanjítj pjrjislanjítj/ by assuming *[vŭskloniti] and *[prisloniti].

[sm] remains : OB. *smějǫ sę* ' I laugh ', Skt. *smáyate*.

[sn] remains : OB. *sněgŭ* ' snow ', Lith. *sniẽgas*, Goth. *snaiws*.

[sl] remains : OB. *slovo* 'word', Skt. *śravas*, Lat. *inclutus* (where [s] ≺ [ḱ]).

[sr] > [str] : OB. *struja* ' current ', Lith. *sraujà*, Skt. *sravati*, (where [s] < PIE *[s]).

OB. *ostrŭ* ' sharp ', Lith. *aštrùs*, Gk. *ákros* Skt. *áśriṣ* ([s] < [ḱ]).

Not only is [s] from both [s] and [ḱ] retained in these clusters, but [z] from [ĝ] or [ĝh] is retained in similar clusters : OB. *znati* ' to know ', Lat. *cognōsco*, Gk. *gignō'skō*, Skt. *jñā*.

Clusters of stop plus [r] remain : OB. *pro–*, Lat. *pro–*; OB. *trĭje* ' three ', Skt. *tráyas*; OB. *krŭvŭ* 'blood', Lat. *cruor*. Clusters of stop plus [l] remain : OB. *plavati* ' to float '.

There is evidence that clusters of dental or velar stop plus [w] are retained : OB. *dvorŭ* 'door', Skt. *dvāram*; OB. *svojĭ* 'own', Lat. *suus*; OB. *tvojĭ* 'your', Skt. *tvas*; OB. *svitěti* 'to shine', Lith. *švitėti*, Skt. *śvitrás* ([s] from [ḱ]). For the combination [swe] the evidence is conflicting : OB. *sestra* 'sister', Goth. *swistar*, Skt. *svásar* but OB. *svekry* 'mother-in-law', Skt. *śvášuras*. After labial stops [w] is lost : OB. aorist *běxŭ* from **bhwēsŭ*.

Clusters of stop plus nasal consonant lose the stop. Examples are :

[tn] > [n] : OB. *plenica* 'tress', from *pletǫ*.

[dn] > [n] : OB. *vŭzbŭnǫti* 'to awaken', iterative *vŭzbŭditi*.

[dm] > [m] : OB. *jamĭ* 'I eat', from stem *jad–*, Skt. *admi*.

Note that OB. *sedmĭ* 'seven' comes from a cluster [bdm] not from a cluster [dm].

[pn] > [n] : OB. *sŭnŭ* 'sleep'. from reduced grade of **swep–*, **supnos*, Skt. *svapnas*.

[bn] > [n] : OB. *dŭnŭ* 'bottom', *dŭbrĭ* 'ravine'.

[gn] remains : OB. *ognĭ* 'fire', Skt. *agniṣ*, Lat. *ignis*.

[kn] > [n] : GB. *lono* 'breast', if derived from **lokno*, from the root *lekt–* 'fly, jump'. In formations like OB. *vyknǫti* 'to learn', the cluster appears unchanged, but this may be a later analogical restoration.

The changes of the consonant clusters has no affect on the inventory of phonemes, although it reduces the number of positions for various phonemes. Clusters are retained of a very limited type : /s r l/ plus consonant, stop plus /r l v y/ and a very few of stop plus /m n/. The affect of these changes, added to the loss of final consonants, is to produce a phonological system of open syllables,

i. e., each syllable is composed of one or more consonants followed by a vowel. The only serious deviation from this pattern is the cluster /r l/ plus consonant where the syllable division may very well be after the /r l/ : PSl. */gor-də/. In the subsequent history of the Slavic languages, this exception is made to conform to the pattern, and it may be that this is evidence that a change had already occurred in Proto-Slavic. Such an assumption is not made here, but it would be possible to assume that /or/ between consonants had already developed into /ro/ or /ra/. This assumption would neither simplify nor complicate the statement of later developments in the various Slavic languages.

3.10 *Tone*

As discussed above (cf. # 3.1.2) the laryngeal is lost after the vocalic allophone of /r l/. When the laryngeal disappears in this position, there arises a difference in tone between the forms that had a laryngeal and those that had not had one. The reflexes of the forms with a laryngeal are : Skt. *īr, ūr*, Lith, *ìr, il*, SCr. *r*\", *u*\", Skt. *ūrṇā*, 'wool', Lat. *lāna*, Lith. *vìlna*, SCr. *vu*\"*na*, R. /vólna/ Lat. *grānum*, 'grain', Lith *žìrnis* SCr. *zr*\"*no* R. /zjirnó/. These forms contrast with the reflexes of forms that did not have a laryngeal : Skt. *ṛ*, Lith. *ir*˜, *il*˜, SCr. *r*̂, *û*, Skt. *vṛkas*, 'wolf' Lith. *vil*˜*kas*, SCr. *vûk*, R. /vólk/; Skt. *kṛṣṇas* 'black', SCr. *cr*̂*n*, R. /čórnay/. The tone on the form that had a laryngeal may be posited as acute (´), reconstructing for PSl./ vjə´lna, zjə´rno/, and the tone on the forms that did not have a laryngeal may be posited as circumflex (ˆ) reconstructing PSl. vjə̂lkə, čə̂rnə/.

With the loss of the laryngeal after the consonantal allophones of /r l/ a similar distinction of tone develops. The combination /*orH/, /*olH/ show the following reflexes: Lith. *ár, ál*, SCr. *ra*\", *la*\", R. *oró*: Lith *várna*, SCr. *vra*\"*na*

R. /varóna/ (from earlier [oró]). The combinations /*or/, /*ol/ show as reflexes: Lith. *ar˜*, *al˜*, SCr. *râ*, *lâ*, R. *óro*; Lith. *var˜nas*, SCr. *vrân*, R, /vóran/ (from earlier [òro]). For the reflex of /*orH, *olH/ PSl. /ór, ól/ may be posited and for the reflex of /*or, *ol/ PSl. /ôr, ôl/ may be posited, or for the words above, /*vórna, *vôrnə/. A similar development takes place in the case of /*er, *el, *erH, *elH/ producing PSl. /ôr, ôl, ór, ól/ but with the preceding consonant palatalized before the front vowel : PSl. /sjôrda/ 'heart', Goth. *hairtō*, OB. *srĕda*, SCr. *srijèda*, R. /sjirjidá/; PSl /pjólnə/ 'full' Lith. *pel˜nas*, OB. *plĕnŭ*, SCr. *pli˜jen*, R. /palón/.

3.11 *Summary*

The phonological system of PSl. may be described as a CV type of system, in which a front vowel occurs after a palatalized consonant and a back vowel after a non-palatalized consonant. The two types of vowels do not contrast in initial position and, since there are no final consonants, there is no possible contrast between the two types of consonants in this position. Such a system is capable of several interpretations. The type of consonant may be considered phonemic, in which case the difference between front and back vowel may not also be considered phonemic and there is a small number of vowels. The difference in vowels may be considered phonemic, in which case the difference between palatalized and non-palatalized consonants may not also be considered phonemic and there is a smaller number of consonants. The feature of frontness with respect to consonant and following vowel may be extracted and assigned phonemic status, in which case there is a smaller number of both vowels and consonants. The first type of analysis has been adopted because of distributional factors (cf. #3.7.2). The purpose of a phonemic analysis is to state the facts of the phonological system. One important facet of the phonological system

of Proto-Slavic is that it is a language that is capable of being analyzed in any one of these three ways. In making a phonemic statement, some analysts will prefer an economy of phonemes, some more regular distribution, but as long as the various statements are mutually convertible, the particular statement chosen is a matter of elegance of statement and not a matter of scientific concern.

4. PROTO-SLAVIC TO RUSSIAN

4. 1 *Development to PSESlavic*

The assumption is made here that Proto-Slavic splits into two branches, West-Slavic and Southeast-Slavic, the latter including the two branches traditionally called South-Slavic and East-Slavic. The evidence for this assumption is included in the statement of the development to SESlavic.

4. 1. 1 *Loss of /ś/*

The phone [ś] becomes [sj] coalescing with the previous [sj], or phonemically /ś/ and /sj/ coalesce as /sj/. This change is one of the changes that cause the split of Proto-Slavic since in West-Slavic /ś/ and /š/ coalesce as /š/. The phoneme /ś/ occurs in the loc. sg. and the nom. pl. of *o*-stems with a stem ending in /x/, thus PSl. nom. sg. /duxə/, loc. sg. /duśæ/, nom. pl. /duśi/. The latter two of these appear in OB with /sj/, loc. sg. *dušě* /dusjæ/, nom. pl. *dusi* /dusji/. Nouns of this type in Czech have /š/, Cz. nom. sg. *hoch* 'boy', nom. pl. *hoši*; nom. sg. *Cech* 'Czech', nom. pl. *Češi*, and in Polish at least used to have /š/, Pol. *Czech* 'Czech', old pl. *Czeszy* (modern Polish plural *Czesi* is an analogical formation). The phoneme /ś/ also occurred in the word for 'all', PSl. /*vjəśə/, OB. *vĭsĭ* /vjəsjə/, SCr. *vàs*, R. /vjésj/, but OCz. *veš*, modern Cz. *ušichny'*, OPol. *wsze*, modern Pol. *wszystko*. With the loss of the phoneme /ś/ in SESlavic the vowels [ü a ǫ], which could previously occur after /ś/ but not after /sj/, may now occur after the latter although, due to the limited distribution of /ś/, such combinations would be rare.

4. 1. 2 Clusters /kvj gvj/

The clusters [kvj gvj] before front vowels become [cvj ʒvj] (later [zjvj]). This is another development that separates West Slavic, where [kvj gvj] in this position

remained, from Southeast-Slavic, where this innovation took place. The effect of this change on the phonological system is that /k, g/ before /vj/ become /c, ʒ/. Examples are :

OB. *cvětŭ* 'flower' *cvisti* 'to flourish,' SCr. *cvàsti*, R./cvjetj cvjisjtjí/, pol. *kwiat, kwiść*, Cz. *květ, kvésti.*

OB. *ʒvězda* 'star', SCr. *zvijèzda*, R. /zjvjizdá/, Pol. *gwiazda* Cz. *hvězda.*

There is some evidence that the cluster [xvj] was similarly affected by this change, since OB. has *vlŭxvŭ* 'magician' n.pl. *vlŭsvi*, and Old Russian has the nom. pl. *volsvi*, whereas Old Czech for *lichva* 'usury' has the loc. sg. *lichvě*. If this is the regular change, then [xvj] becomes [sjvj] in Southeast Slavic before front vowels and remains in West Slavic.

4.1.3. *Clusters* /tl, dl/

The clusters [tl, dl] lose the first member to become [l]. This is a change that takes place only in Southeast Slavic. From the verbs, PSl. *[pjljetǫ] 'I braid' *[čĭtǫ] 'I read', the perfect participles would be *[pjljetjlŭ] /pjljotlə/ *[čĭtlŭ] /čətlə/. These appear as OB. *plelŭ*, *čĭlŭ*, Bg. *plel. čel*, SCr. *plèo* (fem. *plèla*), R./pjljol, pračo'l/, but Pol. *plótł*, Cz. *pletl.* The PSl. *[yedla] 'pine' appears as Bg. *elá*, SCr. *jéla*, R./yelj/, but Pol. *jodła*, Cz. *jedle.*

VAILLANT, *GrComp.* 89, says that this fact does not constitute a very profound division between the dialects of Proto-Slavic because some dialects of Slovenian show a retention of the clusters and some dialects of Russian show the development, [tl, dl] become [kl, gl]. Since this change is an innovation on the part of Southeast Slavic, the situation in Slovenian and Russian may be explained by assuming that the innovation started in Southeast Slavic and simply did not spread throughout all the territory of

Southeast Slavic, missing part of the Slovenian territory and also missing part of the Russian territory. This is confirmed by the fact that the areas missed by this change are peripheral areas, the northwest section of Slovenian territory and the regions of Pskov and Novgorod in Russian territory. Thus from the point of view of the major dialects, this change constitutes a split of Proto-Slavic into two branches that are called here Southeast and West although the isogloss produced by this change is not identical with those produced by the preceding changes.

The OB. form **sedŭlo* in *osedŭlati* 'to saddle', R. /sjidló/, SCr. *sèdlo*, is a problem. As VAILLANT, *GrComp.* 89–90, suggests, the existence of OB. selo, R. /sjiló/ would confirm the fact that the form with the cluster in Russian is a later formation. This is further confirmed by the fact that /ə/ in weak position had not yet been lost when the /dl/ lost its first element. Thus R. /sjiló/ presupposes a PSl. /sjodlo/, a form inherited from PIE, whereas R. /sjidló/ presupposes a PSl. /sjodəlo/, a late formation.

4.1.4 *Summary*

The developments discussed above constitute those changes that differentiate Southeast Slavic from West Slavic. In the case of the loss of /ś/, which coalesces with the phoneme /š/ in the West and with the phoneme /sj/ in the Southeast, we have an innovation on the part of both languages. In the case of the other changes involving the clusters /kvj gvj tl dl/ we have an innovation only on the part of Southeast Slavic. These changes do not constitute a great deal of differentiation in degree between the two languages; the two languages are still very similar to each other. They do, however, constitute a considerable differentiation in kind. After the first change has taken place, it is impossible for West Slavic to coincide with Southeast Slavic or vice versa except by all three of the pertinent phonemes, /ś š sj/, falling together, and since this

is a change that has not taken place up to the present time, it is clear that this change by itself has caused a split in Proto-Slavic. The fact that the phoneme, /ś/, involved in this change does not carry a heavy functional load is again a matter of degree of differentiation, not of kind. The change in the clusters represents an innovation on the part of Southeast Slavic only. The change is phonemic coalescence, /k g/ coalesce with /c ʒ/ in position before /v/ and /tl, dl/ coalesce with /l/, and also constitutes a significant difference between the two branches. The phonemic system produced by these changes is that of Proto-Southeast-Slavic. It should be mentioned here that with respect to West Slavic, since these are not all the changes common to the members of this branch, the phonemic system assumed here at this stage for West Slavic does not represent Proto-West-Slavic, but a stage of Pre-West-Slavic. Moreover, since it is not pertinent to this discussion, no attempt will be made to establish the phonemic system of Proto-West-Slavic.

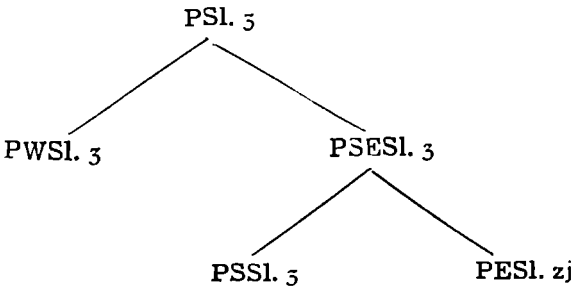
4.2 *Development to PESlavic*

Proto-Southeast-Slavic is split by a series of changes into two branches, South-Slavic and East-Slavic. In discussing the changes that produce this split, it will be shown that these changes do not contradict the previous assumption that Proto-Slavic is split into Proto-Southeast-Slavic and Proto-West-Slavic.

4.2.1 *Loss of /ʒ/*

The phone [ʒ] falls together with [zj]. It is necessary to assume that PSESl still had [ʒ] since it appears in OB documents. It is possible to assume that the change takes place between PSESl and PESl since all the East Slavic languages show this change. Since Polish retains this [ʒ] it is necessary to assume it for PWSl as for PSESl, and

West Slavic neither confirms nor contradicts this assumption of the way PSl split.



This change shows up in the loc. sg. and the nom. pl. of o-stems, so that the noun /*rogə/ 'horn' would have the following forms : PSESl /*roɜæ/ for loc. sg. and /*roɜi/ for nom. pl.; PESl /*rozjæ/ and /*rozji/. The noun, PSl or PSESl /*kənjęɜə/ becomes PESl /*kənjęzjə/. Distributionally the vowel phonemes /ǫ a u may now occur after /zj/.

4.2.2 *Loss of /y/ in clusters*

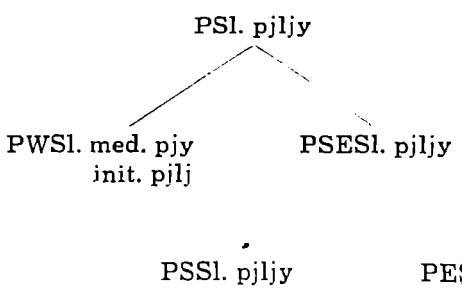
The phone [y], when it occurs as last member a consonant cluster, is lost, [pjljy, bjljy, mjljy, vjljy, ljy, njy, rjy] become [pjlj bjlj mjlj vjlj lj nj rj] and the clusters [tjy djy] become [č ž].

PSl. *zjemjljya* /zjomjljya/ > *zjemjlja* /zjomjlja/, OB. *zemlja*
PSl. *kupjljyǫ* /kupjljyǫ/ > *kupjljǫ* /kupjljǫ/, OB. *kupljǫ*
PSl. *konjyï* /konjyə/ > *konjï* /konjə,/ OB. *konjï*
PSl. *morjye* /morjyo/ > *morje* /morjo/, OB. *morje*
PSl. *sjvjætjya* /sjvjætjya/ > */sjvjæča* /sjvjæča/, OB. *svěšta*
PSl. *mjedjya* /mjodjya/ > *mježa* /mjoža/, OB. *meždа*
PSl. *notjyï* /notjyə/ > *nočï* /nočə/, OB. *noštï*

Phonemically /y/ no longer occurs as last member of consonant clusters, which reduces the number of positions

in which /y/ may occur. The clusters /tjy djy/ coalesce with the previous /č ž/[1], and /ljy njy rjy/ coalesce with /lj nj rj/. The distribution of the phonemes /ǫ u/ is now much more regular since they may now occur after all consonants except /pj bj mj vj tj dj/, although they are rare after /sj zj/ (cf. # 4.1.1 and 4.2.1). The phonemes /a/ and /æ/ now contrast, not only after /c ʒ ś/ (cf. # 3.7.5), but also after /lj nj rj sj zj/.

The development of the labial clusters confirms the split of Proto-Slavic into West Slavic and Southeast Slavic, since in West Slavic in medial position the [lj] is lost. The [lj] is also lost in Bulgarian and in Macedonian in medial position, but this must be an independent development since it is not lost in this position in Serbo-Croatian or in Old Bulgarian.



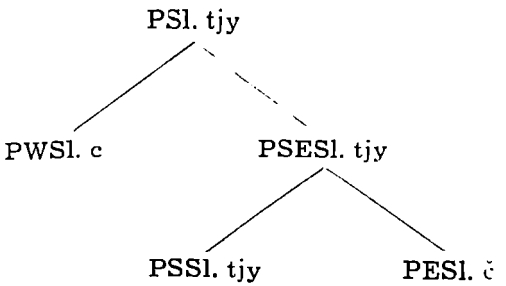
OB. *kapljǫ*, *kapjǫ*, Bg. *kápja*, SCr. *ka"pljem*, R. /kápjlju/, Pol. *kapię*, OCz. *kapi*.

OB. *zemlja*, Bg. *zemjá*, SCr. *zèmlja*, R./zjimjljá/, Pol. *ziemia*, Cz. *země*.

but in initial position all languages retain the [lj] :

OB. *pljujǫ* 'I spit', Bg. *pljúja*, SCr. *plju"jem*, R./pluyú/ Pol. *pluję*, Cz. *plijí*.

The development of the dental clusters [tjy djy] also confirms the assumed split of Proto-Slavic since they undergo an innovation in West Slavic, coalescing with the previous [c ʒ].

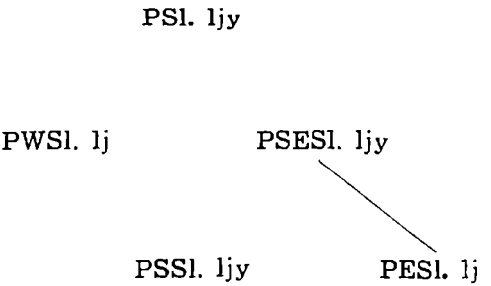


The symbolization /tjy djy/ for PSl, PSESl and PSSl does not necessarily imply that there has been no phonetic change in this cluster, but merely that /tjy djy/ are kept distinct from all other phonemes and combinations of phonemes at least down to PSSl.

PSl. [*sjvjætjya] /sjvjætjya/, OB. *svěšt'a*, Bg. *svešt*, Mac. *svek'a*, SCr. *svìjèća*, Slov. *svéča*, R. /sjvjičá/, Pol. *świeca*, Cz. *svíce*.

PSl. [*mjedjya] /mjodjya/, OB. *meždа*, Bg. *meždu*, Mac. *még'u*, SCr. *mèd,a*, Slov. *méja*, R. /mjižá/, Pol. *miedza*, Cz. *meze*.

In the case of the clusters /ljy njy rjy/ the following development is assumed :



It is necessary to assume /ljy/ for PSSl since the reflex of this cluster is still phonemically distinct from other phonemes and clusters to the present time, SCr. *vo"ljen* 'liked' (from /ljy/), but *vòleti* 'to like' (from /lj/. In the case of the cluster /rjy/, which loses its palatalization in SCr to become /r/, it is assumed that this loss of palatalization occurs later. At first glance it might seem from the chart of developments that West Slavic and East Slavic undergo the same developments, which would contradict the split of Proto-Slavic assumed above. It is necessary to assume a similar but independent development in West Slavic and in East Slavic. The independence of development is confirmed by the parallelism of development of the /y/ clusters. All the /y/ clusters undergo an innovation on the part of WSl but remain in SESl, confirming the first split of Proto-Slavic into PSESl and PWSl, and then all these clusters undergo an innovation on the part of East Slavic but remain in South Slavic confirming the second split of PSESl into PSSl and PESl.

Since all statements here are made and arranged with the purpose of stating the development that ultimately leads to Modern Russian, no implications about the relative chronology of the developments mentioned for WSl should be assumed. For the East Slavic branch the change of /ś/ to /s,/ must take place before /tjy/ becomes /č/, because the latter change is peculiar to East Slavic whereas the first is common to both East Slavic and South Slavic. In the case of West Slavic it is quite possible that /tjy/ becomes /c/ before /ś/ becomes /š/, as VAILLANT, *GrComp.* 39 and 67, suggests, where he implies that /tjy/ becomes /c/ in the tenth century but that /ś/ becomes /š/ in the eleventh century. It may be noted here that there is no attempt to establish the specific change that caused the split of PSl into West and Southeast Slavic, but merely to establish that the changes discussed in # 4.1 are not only sufficient to indicate that such a split occurred, but the

changes discussed in this section, # 4.2, also indicate such a split and an alternative explanation would require assuming too many similar changes taking place independently in two branches.

4.2.3 *Nasal vowels*

The phone [ę] develops into [a] and the phone [ǫ] develops into [ü] after palatal consonants and into [u] after non-palatal consonants. Where formerly (3.7.5) [æ], but not [a], could occur after /pj bj mj vj tj dj sj zj lj nj rj/ the loss of /y/ after /lj nj rj pjlj bjlj mjlj vjlj/ had introduced [a] after /lj nj rj/. Now that [ę] becomes [a] this latter phone may occur after all the palatals. The situation is similar for [ü] which now may occur after all the palatals, except the labials. Phonemically /ę/ and /a/ coalesce as /a/, and /ǫ/ and /u/ coalesce as /u/, and the distribution is now fairly regular since the phonemes /o ə i a u/ may occur after all consonants, palatal or non-palatal and the phoneme /æ/ may occur after all the palatal consonants except /č ž š y/. It may be assumed that the phone [a] after palatals was a more front vowel than after non-palatals, although it was in contrast with [æ]. It may even be assumed that it is at this stage that [æ] develops into a high-mid front vowel [e] (cf. # 4. 3. 2), although if so it contrasts with the front allophone of the phoneme /o/ which must be a low-mid front vowel [ɛ]. Even if this is assumed, it would not be a phonemic change, and therefore the phonemicization /æ/ will be retained at this point.

PSl. **zǫbŭ* /zǫbə/ > **zubŭ* /zubə/, R. /zup/ 'tooth', OB. *zǫbŭ*.

PSl. **njesǫ* /njosǫ/ > *njesu* /njosu/, R. /njisú/ 'I carry', OB. *nesǫ*.

PSl. **dušǫ* /dušǫ/ (acc. of **duša*) > *dušü* /dušu/, R. /dušú/ 'spirit', OB. *dušǫ*.

PSl. **pjętjĭ* /pjętjə/ > *pjatjĭ* /pjatjtjə/, R. /pjatj/ 'five' OB. *pętĭ*.

PSl. **mjęso* /mjęso/ > *mjaso* /mjaso/, R. /mjása/ 'meat', OB. *męso*.

This is a development that separates East Slavic from South Slavic. It is also an innovation on the part of East Slavic since South Slavic retains the nasals as indicated by the forms cited above from OB. The earliest old Russian documents in the middle of the 11th century show confusion of [ǫ] and [u] and also of [ę] and [a], which indicates that this change had taken place before this time. There is some evidence that this change may have taken place as early as 950 A. D. (cf. CHERNYX, *IGRY* 71).

4.2.4 *Initial* [ye]

Initial [ye] becomes [o]. The conditions under which this change takes place are obscure. It is found in words like R. /ósjin, ózjira, aljénj/ 'autumn, sea, deer' which in SCr are *jesen, jelen, jezero*. CHERNYX, *IGRY* 72, says that this change takes place in words with [e] in the second syllable and stress on the first or second syllable. He mentions Russian /adjín/. SCr. *jedan*, but does not attempt to explain it and he does not mention [odva] which occurs alongside [yedva]. In Old Russian documents writings such as *ugŭ*, *unŭ* occur where OB. has *jugŭ*, *junŭ*, and Russian has /útra, úxa/ where Polish has *jutro, jucha*. The evidence is not consistent but it is possible that initial [y] is lost, but largely replaced by analogical formations or by borrowings from OB, or it may be lost in some dialects and not by others and then result in a mixture of forms in the standard language. Once the initial [y] is lost, there are two possible developments. The first possibility is that the following [e] will remain, which would be contrary to the phonemic system at that time, but it could remain and produce a change in the phonemic system. The second possibility is that, with the loss of [y], the vowel is made to conform to the phonemic system and becme the expected allophone of /o/ in initial position, i. e. [o]. It is this latter change that

takes place. This change, if it is a regular phonetic change, produces the phonemic change : initial /yo/ becomes /o/ or initial /y/ is lost before /o/, [*yesjenjĭ] /yosjonjə/ > *osjenjĭ* /osjonjə/. There are exceptions to this change, although some of them are clearly borrowings from OB such as *yedino-* in compounds like R. /yidjinóčistva/ 'loneliness'. This change is characteristic of the East Slavic languages, R. /adjín/ 'one', Uk. *odín*, BR. *odzín*, but Scr. *jèdan*, Bg. *edín*.

4.2 5 *Development of* /or, ol/

The groups [or ol er el], in position between consonants, develop into [oro olo erje olo] respectively. These groups could occur with either type of tone, [ór ôr]. The rising tone develops at the same time into stress on the second syllable, [oró], whereas the circumflex tone develops into stress on the first syllable, [óro]. Before the group [el], a palatalized consonant loses its palatalization so that [el] coincides in its development with [ol]. After the sibilants [č ž š], in which position the combination [ol] could not occur (because of the origin of [č ž š], cf. #3.7), [el] undergoes a special development to [elo]. In other words, after [č ž š], the only phone that fits in with the system of the language at that time is the one that occurs, namely [e]. If [el] had developed into [olo] after [č ž š], then [e] and [o] would have been in contrast in this position and it would have been at this point that the phoneme /o/ was split into two phonemes. Since this split does not occur, the only other development that could take place does; after [č ž š] only the allophone [e] could occur and it remains in this position even though elsewhere [el] develops into [olo]. This development is similar in nature to the development in initial position where [e] become [o] after initial [y] is lost, since both developments involve retaining the phoneme /o/ with its two allophones [e o]. These developments may be considered as evidence

for the correctness of the analysis assumed here, that [e] and [o] are allophones of /o/.

Phonemically this means that /or ol/ > /oro olo/ and that /–jor –jol/ > /–joro –jolo/ with loss of palatalization of preceding consonant before /ol/ but not before /or/. Also the tone /–'/, when it occurs on these groups, becomes /–––'/, and the tone /–˜/ become /–'––/. There is no longer a phonemic distinction in tone; it is replaced by a phonemic distinction in the position of the stress.

Examples of the loss of tone are :

[ōr] > [óro]

Lith. *var˜nas*, SCr. *vrân*, P.Sl. **võrnŭ* > *vorónŭ* /vóronə/, R. *vóran*

[ór] > [oró]

Lith. *várna*, Scr. *vra˜na*, PSl. **vórna* > **voróna* /voróna/, R. *varóna*.

Examples of the development of the combinations apart from tone are :

/or/ > /oro/; /–jor/ > /–jorjo/

Goth. *gards*, Lith. *gar˜das*, PSl. **gōrdŭ* / gōrdə / > górodŭ/górodə/, R. /górat/, SCr. *grâd*, Uk. *hórod*.

Goth. *hairtō*, PSl. **sjerda* /sjorda/ > *sjerjeda* /sjorjoda/, R./sjirjida'/ 'heart', Uk. sereda'.

/ol/ > /olo/

Lith. *galvà*, PSl. **golva* /golva/ > **golová* /golová/, R. /galavá/ 'head', Uk.-*holová*.

Lith. *pel˜nas*, PSl. **pelnŭ* /polnə/ > **polonŭ* /polonə/, R. /palo'n/ 'booty', Uk. *polon*.

PSl. **čelnŭ* /čolnə/ > **čelonŭ*, /čolonə/, OR. *čelonŭ*, 'member', Uk. *čelén* (Mod. Russ. /čljen/ is a borrowing from Church Slavic)

In initial position before a consonant the groups [or ol] show two different developments depending on the tone: [ór ól] > [ra la], and [ōr ōl] > [ro lo]. There are no sure examples of initial [er el] /yor yol/.

PSl. *ōrst- > *rostí, *rostŭ 'to grow, growth,' SCr. *râst*, Uk. *rostí*, R. */rastjí/* (with a writing that could represent either a Church Slavic borrowing or a misunderstanding of the morphophonemics of the word, and a pronunciation that could represent either the borrowing or the original form), /rost/, Pol, *róść*, Cz. *rostu*.

PSl. *ōlkŭtjĭ /ōlkətjə/ > *lokŭtjĭ, /lokətjə/, R. /lókatj/, 'elbow', Uk. *lokotj*, SCr. *lâkat*, Pol. l˜*okiec'*, Cz. *loket*.

PSl. *órdlo /órdlo/ > *ralo /ralo/, OR. *ralo* 'hoe', Uk. *ralo*, SCr. *ra"lo*, Pol. *radl˜o*, Cz. *radlo*.

PSl. *óljnjĭyĭ /óljnjəyə/ > *lanjĭ /lanjə/, R./lanj/ 'deer', Uk. *lan*, SCr. *la"ne*, Pol. *lania*, Cz. *lan˜*.

The developments in initial position in East Slavic agree with those of West Slavic. It is assumed that [ōr] became [ro] separately and independently in both East Slavic and in West Slavic. It is further assumed that [ōr] became [ro] as early as Proto-Slavic, that it was retained in West Slavic and also in Southeast Slavic, but when this last split up it was retained in East Slavic but in South Slavic fell together with initial [ór] and medial [ōr ór] as [ra]. This may be the explanation of some forms with initial [ro] in OB. documents, OB. *rabŭ*, *robŭ* 'slave, servant', *rozga*, *razga* 'twig', since these could then be a sporadic retention of the earlier form. To make this assumption only in the case of [ōr] might not be reasonable, but we might assume that /or ol/, both in initial position and in position between consonants, became /ro lo/ in Proto-Slavic, a change that would not be phonemic in the sense that no new contrasts would be introduced

by it. The developments discussed in #3 all tend to produce a language all of whose forms are composed of open syllables. The main exception to this type of syllable structure are forms with this /or ol/ initially or between consonants. If we assume that Proto-Slavic had already changed these to /ro lo/, then this exception would be removed. Whether this chronology is accepted or not, the development of an earlier form, whether /or/ etc. or /ro/ etc., into /oro/ is a development between Proto-South-East-Slavic and Proto-East-Slavic.

There are in Russian many borrowings from Church Slavic, often producing doublets, one showing the regularly developed East Slavic form and the other the borrowed South Slavic form. When these doublets occur, the borrowed one is likely to have a more abstract meaning as would be expected from literary borrowings: /galavá/ 'head', /glavá/ 'main, chief'; /malakó/ 'milk' and the more learned /mjljikapjitáyuščiy/ 'mammiferous'. These borrowings do not affect the phonological system of the language except to increase the number of consonant clusters with /l/ or /r/ as second member.

4.2.6 *Loss of /ə/*

The phones [ĭ ŭ] are lost in weak position, but remain in strong position. Weak position is most easily described in a negative manner as that position which is not strong. Strong position is defined as any one of the following three positions:

1. the initial syllable of a word if stressed: **sŭxnǫtji* /səxnǫtji/ > **sŭxnǫtji*/səxnǫtji/, R. /sóxnutj/ 'to dry';

2. [ĭ ŭ] followed by [r] or [l] plus a consonant: PSl. **dŭlžĭnŭ* /dəlžənə/ > **dŭlžĭn*/*dəlžən/, R. /dólžin/ 'must', PSl. **pjĭrvŭyĭ* /pjərvəyə/ > **pjĭrvŭy* /pjərvəy/, R. /pjérvay/ 'first';

3. in a succession of syllables containing exclusively either [ĭ] or [ŭ], the even numbered syllables counting from the end are in strong position : PSl. *sŭmjĭrjtjĭnŭyĭ* /səmjərjtjənəyə/ > **sjmjĭrtnŭy* /sjmjərtnəy/, R. /sjmjértnay/ 'fatal', PSl. otjĭcĭ/otjəcə/ > *otjĭc/otjəc/, R. /atjéc/ 'father'.

The first and second positions take precedence over the third. Thus the form **sŭxnǫtji* would have lost the [ŭ] by the rule of the third position but retains it by the rule of the first position. Also the form **sjmjĭrtnŭy* /sjmjərtnəy/ would retain [ĭr] by either the second or third position rule, but the form *sjmirjtjĭn* /sjmjərjtjən/ from the short form of the adjective **sŭmĭrtĭnŭ* /səmjərjtjənə/ can have [ĭr] only by the rule of the second position, although there is a possibility that this form may derive by analogy with the previous one. With respect to the third position, it should be noted that this statement applies only to a succession of syllables containing either [ĭ] or [ŭ]. If a syllable contains some other vowel, this syllable is not to be counted, and the count must start again beginning with the next [ĭ] or [ŭ] proceeding toward the beginning of the word. Thus, in PSl. *šĭdlŭ*/šədlə/, the first syllable, or second from the end, counts as strong and it develops into **šĭl* /šəl/, but in the feminine *šĭdla*/šədla/ the first syllable counts as first from the end if we count only those with [ĭ] or [ŭ] in them, and is hence weak and develops into **šla*/šla/. There are many examples where analogy has operated, thus **vŭšĭdla* /vəšədla/becomes **vŭšla* /vəšla/ regularly, but **vŭšĭdlŭ* /vəšədlə/becomes **vušĭl* /vəšəl/ with [vŭ] by analogy with the feminine, neuter and plural forms. There is some confusion between forms in [ĭl] and in [ŭl], thus Lith. *vil˜kas*, and Pol. *wilk* indicate an original [ĭl] but Russian does not distinguish this form, /volk/ 'wolf', from the form /dolk/ 'duty', where Pol. has *dl˜ug* indicating an original [ŭl]. It is to be assumed that [ĭl] coincided with [ŭl], just as [el] coincided with [ol] (cf. # 4.2.4).

Phonemically /ə/ is lost in weak position and remains in strong position, leaving the following vowels : /i u o æ a ə/, of which /ə/ may not occur finally. In # 2.7.2 alternative analyses of the data were considered, one of which was to consider palatalization of consonants non-significant resulting in an analysis with nine oral vowel phonemes. Now with the loss of /ə/ [ĭ ŭ], in final position, palatalized consonants contrast directly with non-palatalized consonants in final position and this particular analysis is no longer possible. Following the nine vowel analysis, then with the loss of /ə/ in final position it would be necessary to state that this produces a contrast between the palatalized and non-palatalized consonants in final position and thus makes the previously non-significant feature of consonant palatalization, a significant feature, which in turn causes the phonemes /i/ and /i̯/, /u/ and /ü/, /ĭ/ and /ŭ/, /e/ and /o/ to coalesce, although /æ/ and /a/ remain separate phonemes as do the nasal vowel phonemes.

There may very well be a difference in the time of these developments, i. e. /ə/ may have been lost in certain types of weak position earlier than in other types (cf. Chernyx, *IGRY*, 99–101), but this is not pertinent to the present discussion since no other changes intervened. The loss of /ə/ in weak position is common to all the East Slavic languages, and hence the change takes place in Pre-East-Slavic. The phoneme /ə/ also undergoes a change in strong position, but this change takes place after East Slavic has split and will therefore be discussed later (cf. # 4.4)

4.2.7 *Consonant Assimilations*

With the loss of the phoneme /ə/ in many positions, consonant clusters arise. These clusters are in many cases simplified largely by way of assimilations..

Assimilation takes place with respect to voicing. The assimilation is progressive and quite consistent. A voiceless consonant becomes voiced before a voiced consonant: PSl. **sŭdjælatji* /sədjælatji/ > **zjdjælatji* /zjdjælatji/, R. *zjdjélat*, 'to do'; PSl. **otŭdalŭ* /otədalə/ > **oddal* /oddal/, R. /óddal/ 'to give back'. A voiced consonant becomes voiceless before a voiceless consonant : PSl. **podŭpjisatji* /podəpjisatji/, > **potpjisatji* /potpjisatji/, R. /patpjisátj /'to sign'; PSl. **nožĭka* /nožəka/ > **nośka* /noška/, R. /nóška/, 'small foot', In modern Russian these assimilations are most commonly not indicated in the writing system : *sdelat'* /zjdjélatj/, *podpisat'* /patpjisátj/, although in some forms the assimilation is indicated : R. *zdes'* /zjdjesj/, OB. *sĭde* ' here ', There is one notable exception to this rule of assimilation; voiceless consonants are not assimilated to a following /v/, R. atvarítj/ ' to open ' from **otŭ–*.

Progressive assimilation takes place with respect to palatalization, although this is not as consistently carried through as is assimilation with respect to voicing. A non-palatalized consonant is normally assimilated to a following palatalized consonant : R. /zjdjélat,/ ' to do ' from **sŭ–*, /sjnjimátj/ ' to take off ' from **sŭ–*, /djvje/ ' two ' from **dŭvjæ*; although prefixes ending in a stop consonant do not assimilate to a following palatalized consonant : R. /atvjisjtjí/ ' to lead away ' from **otŭ–*, /patpjisátj/ ' to sign ' from *podŭ–*. A palatalized consonant is normally assimilated to a following non–palatalized consonant, although this assimilation is inhibited when the second consonant is a velar or labial, thus : PSl *bjĭratji* /bjəratji/ > R. /bjratj/ ' to take', PSl. **umjĭnŭyĭ* /umjənəyə/ >R. /úmnay/ 'intelligent', PSl. **kozjĭla* /kozjəla/ >R. /kazlá/ g.sg. of 'goat', but before a velar or labial, PSl. *vozjĭmǫ /vozjəmǫ/ > R. /vazjmú/ ' I take ', PSl. **gorjĭkayego* /gorjəkayogo/ > R. /górjkava/ g.sg.m. of ' bitter '. The phoneme /lj/ does not assimilate to a following non-palatalized consonant, velar labial or otherwise : R. toljka/ ' only ' and also R. /davóljna/ ' enough '.

There is very little by way of assimilation with respect to position of articulation, but the phoneme /s/ does assimilate to a following /š/ or /ž/ : PSl. *sŭžętjyi /səžętjyi/ > R. /žžeč/ 'to burn'.

Where some complex clusters would be produced by the loss of /ə/, these are sometimes simplified by way of the loss of one of the consonants : PSl. čisjtjĭnŭyĭ /cisjtjənəyə/ > R. /čísnay/ 'clean' **pozjdjĭno* /pozjdjəno/ > R. /pózna/ 'late', **sjĭrjdjĭce* /sjərjdjəce/ >R./sjérci/ 'heart', **rusĭsjkŭyĭ* /rusjəskəyə/ > R. /rúskay/ or /rúsjkjiy/ 'Russian'.

This statement is not meant to be exhaustive, but to give the main assimilative developments. For the present purposes it is sufficient to note that the effect of these developments on the phonological system is to reduce considerably the number of possible consonant clusters that would have developed from the loss of /ə/ if these assimilations had not taken place.

4.2.8 *Summary*

The changes discussed in this section 4.2 constitute those changes which separate East Slavic from South Slavic, those changes which cause South-East Slavic to split into two branches. Generally speaking it is not possible to establish the relative chronology of these changes, although it may be that [y] was lost in clusters before [or] became [oro], otherwise it might be expected that [or] would become [oro] before [y], but PSl. **morjye* /morjyo/ 'sea' becomes **morje* /morjo/ and not **moroye* /moroyo/. This is, of course, not very conclusive since this change involves /orj/ and not /or/ and the latter may already have developed into /ro/ as has been suggested in # 4.2.5 and in any case the change may have been inhibited before [y]. It is, therefore, not possible to state which of these changes first produced the split in South-East-Slavic, but any one of them might have, and the combination of changes

produces a language which will be called Proto-East-Slavic.

In summary, Proto-East-Slavic has the following vowels, /i u ə o æ a/, and the following consonants, /p b m v t d s z l n r k g x pj bj mj vj tj dj sj zj lj nj rj ć š ž c y/. The phoneme /æ/ is limited to position after a palatalized consonant excepting /č ž š y/, /ə/ does not occur in absolute final position, /u/ does not occur after /pj bj mj vj/, but otherwise any vowel may occur after either type of consonant. All the vowel phonemes, except /æ/, have front allophones after palatal consonants and back allophones after non-palatal consonants.

4.3 *Development to Proto-Russian*

Proto-East-Slavic is split by innovations on the part of Ukrainian that are not shared by Russian or Byelorussian. The language that remains when Ukrainian splits off we shall call Proto-Russian. Since there are almost no changes between Proto-East-Slavic and Proto-Russian, it will be necessary to discuss those innovations in Ukrainian that cause the split.

4.3.1 *PESl Phoneme /i/*

At some time between Proto-East-Slavic and modern Ukrainian the sounds [i] and [ɨ] coincide as [ɪ], a slightly backed high-mid front vowel. This is a coalescence of allophones of the same phoneme and is not a phonemic change. Further, since all the occurrences of the phoneme /i/ in PESl, which represent a point of contrast with other vowel phonemes in the system of that language, continue into modern Ukrainian still contrasting with all the other vowel phonemes of that language, there never is a phonemic change involving this phoneme. It is not possible, therefore, to determine the time at which [i] and [ɨ] coalesce, but since they ultimately do coalesce and since in

modern Ukrainian it is more reasonable phonetically to phonemicize this phoneme as /ɪ/ rather than as /i/, this phonemicization will be adopted at this point. It is likely that the palatalization of the preceding consonant was lost at the time that these two sounds coalesced. Examples of this change are : PESl. **mitji* /mitji/ 'to wash' > Uk. *мити* /мɪтɪ/ (the Russian cognate having a non-palatal [m], /mitj/); PESl. **pjivo* /pjivo/ 'beer' > Uk. *пиво* /пɪво/ (the (Russian cognate having a palatal [pj], /pjíva/).

4.3.2 [æ] > [i]

Proto-East-Slavic [æ] becomes [i]. It seems quite likely that [æ] had already developed into a mid-front vowel [e] by the time of Proto-East-Slavic, although if it did, it did not coincide with the front allophone [ɛ] of the phoneme /o/. Even if this change had taken place, it had no effect on the phonemic system and it can be represented by the symbol /æ/ even if it was phonetically [e]. Like the change discussed in # 4.3.1, it is difficult to determine at what time the phonetic change of [æ] to [i] took place, but it does ultimately, and the phonemicization /i/ will be adopted at this point. It is clear, however, that the phonemicization /i/ for the PESl /æ/ cannot be adopted until after /ɪ/ for PESl /i/ is adopted, and it is for this reason that the present order of statements has been made. It is possible that the palatalization of the preceding consonant was lost at this time, although it may have been later. Examples of this development are : PESl. **bjæl* /bjæl/ > **bjil* /bjil/, Uk. /bilɪy/ 'white' in the long form; PESl. **ljæto* /ljæto/ > Uk. /lito/ 'summer'.

4.3.3 *PESl phoneme /o/.*

The phones [e] and [o] in closed syllables become [i], coalescing with each other and also with [i] from [æ]. Phonemically /o/ coalesces with /i/ (from PESl /æ/), the palatalization of the consonant preceding [e] being lost Examples showing the development in both closed and open

syllables are : PESl. **pječ* /pjoč/ > Uk. /pič/ 'stove' in a closed syllable, but gen. /peči/ in an open syllable, PESl. **tok* /tok/ Uk. /tik/ 'current', but gen. /toku/. As in the case of the two previous developments, it is not possible to determine the exact time of the phonetic development involved here, but the time of the phonemic development relative to other developments can be determined. Phonemically /o/ in a closed syllable coalesced with PESl. /æ/, although the phonetics at the time of coalscence may be obscure. The conditioning factor for the development of /o/ is a closed syllable, so that it is necessary to assume that /ɔ/ must have been lost in weak position before this change could take place. There would not otherwise have been closed syllables in the necessary forms, and it is not reasonable to assume that there was any reason for /o/ to develop into /i/ when followed in the next syllable by /ɔ/ but not when followed in the next syllable by any other vowel. The coalescence of /o/ and /æ/ can then be placed after the loss of /ɔ/. In the next section it will be shown that it must have taken place before another change. Once /o/ and /æ/ have coalesced, the phonemicization /i/ for the result of the coalescence is adopted here, and this in turn requires assuming the phonemicization /ɪ/ for PESl. /i/. It is probably worth while emphasizing that this phonemicization may represent the following phonetic situation : /i/ [e], /ɪ/ [i], or some other different possibility, but the phonemic statements are valid even though they may reflect the phonetics of a slightly later period a little more accurately than they do the phonetics of the period under discussion.

There is evidence from documents of southern provenience (cf. CHERNYX, *IGRY* 101–2) that the reflex of PSl. [e] was written with the symbol for the reflex of PSl. [æ], i. e. PSl.* [šestĭ] 'six' written [šæstĭ]. This indicates that [e] had fallen together with [i] from [æ] at least by the second half of the 12th century. CHERNYX suggests that

at that time the symbol [æ] represented a long [e] or a diphthong [ye]. This may very well be true, but it may also have represented a high-mid front vowel [e] as suggested in the previous paragraph. The phonemic statement adopted here is to be interpreted as meaning that the reflex of PSl. /o/ in a closed syllable coalesced with the reflex of PSl. /æ/ as a phoneme that was distinct from the reflexes of PSl. /i ə u a/ and also distinct from the reflex of /o/ in an open syllable, that sooner or later this phoneme became phonetically [i] and may be designated as the phoneme /i/ at this time, and that Uk. [i] and [ɨ] fell together as [ɪ] before [æ] became phonetically [i].

4.3.4 */ə/ becomes /o/*

The phones [ĭ ŭ] in all positions in which they had been retained become respectively [e o]. This is a change that is common to all members of East Slavic. However, this change could not have occurred in Ukrainian until after those mentioned in # 4.3.1–3, because [e] and [o] from [ĭ ŭ] do not become [i] in a closed syllable, and therefore [i ŭ] could not have coalesced with [e o] until after [e o] in a closed syllable had coalesced with [æ] as [i]. This change may, then, occur independently in Ukrainian and in Proto-Russian, but it may also be considered as a single change taking place at a single time and spreading throughout the whole East Slavic territory even though this territory has already been split by the changes mentioned above in this section. At this time Proto-Russian and Ukrainian would only be differentiated by these changes and it is possible for a single change to affect the whole territory. Phonemically this change means that /ɔ/ and /o/ coalesce as /o/, and the vowel system of Pro-Russian is reduced to five vowels, /i u o æ a/.

As evidence that [e o] in a closed syllable became [i] in Ukrainian before [ĭ ŭ] became [e o], the following forms may be cited :

PESl. **tok* /tok/ > Mod. Uk. /tik/, gen. /toku/ 'current'
but **sŭn* /sən/ > „ „ /son/, gen. /snu/ 'sleep'
**pjec* /pjoč/ > „ „ /pič/, gen. /peči/ 'stove'
but **pjĭs* /pjəs/ > „ „ /pes/, gen. /psa/ 'dog'
**šesjtj*/šosjtj/ > „ „ /šisjtj/ 'six'
but **čisjtj* /čəsjtj/ > „ „ /česjtj/ 'honor'

If [ĭ ŭ] had become [e o] before [e o] in a closed syllable became [i] in Ukrainian, then Ukrainian would have had */sin, pis, čisjtj/ instead of /son, pes, česjtj/. As examples of the Proto-Russian change /ə/ > /o/, the Proto-Russian may be cited for the forms above with /ə/ : **son* /son/, **pjes* /pjos/, *čosjtj /*čosjtj*/.

4.3.5. *Final Consonants*

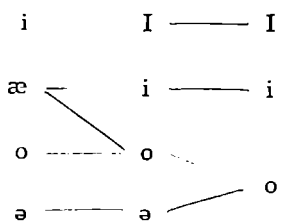
With the loss of the phoneme /ə/ in weak position, consonants may appear in final position, and these consonants become voiceless in Proto-Russian. It is assumed here that this process of unvoicing of final consonants is a later development than the assimilations mentioned in # 4.2.7 because the unvoicing does not take place in Ukrainian. It is possible that the development takes place earlier than the other changes mentioned in this section and is therefore the first development to split Proto-East-Slavic, but in any case this change and those mentioned above for Ukrainian clearly cause a split of Proto-East-Slavic into Proto-Russian and Ukrainian. A couple of examples will suffice to illustrate this development : PESl. **sadŭ* /sadə/ 'yard' > PR. /sat/; PESl. *zubŭ /zubə/ 'tooth' > PR. /zup/.

4.3.6 *Summary*

Most of the changes that cause a split in Proto-East-Slavic are innovations on the part of Ukrainian, # 4.31–3. but the unvoicing of final consonants is an innovation on

the part of Proto-Russian. There is one development during this period, /ə/ > /o/, that is common to both Ukrainian and Proto-Russian. The phonemic system of Proto-Russian differs from that of Proto-East-Slavic only in the loss of the phoneme /ə/. In summary the phonemes, then, are /i u o æ a/ for vowels and /p b m v t d s z l n r k g x pj bj mj vj tj dj sj zj lj nj rj č š ž c y/ for consonants.

The chronology of the developments in Ukrainian can be best illustrated by the following chart :



4.4 *Development to Proto-Great-Russian*

Proto-Russian is split into Byelorussian and Proto-Great-Russian by innovations that take place in both branches.

4.4.1 *Development of /ə/*

Although the main concern here is with the development from Proto-Russian to Proto-Great-Russian, it is worth noting at this point an innovation on the part of Byelorussian that contributes to the split of Proto-Russian. In section 4.3.4 it was stated that /ə/ became /o/ in Proto-Russian. This is true for Byelorussian except for one position. PSl. [rŭ rjĭ lŭ ljĭ] /rə rjə lə ljə/, when unstressed between consonants, appear in Byelorussian as [ri rji li lji] instead of [ro rje lo lje], i. e. /ə/ in this position falls

together with /i/ instead of with /o/: PR. **drova* /drova/ 'wood', **tjrjevoga* /tjrjovoga/ 'anxiety', **glotatj* /glotatj/ 'to swallow', **sjljoza* /sjljoza/ 'tear'; R. /dravá/, /tjrjivóga/, /glatátj/, /sjljizá/, but BR. *driva*, *tjrjivoga*, *glitac*, *sjljiza*.

The ending [-ŭy -jiy] /-əy -jəy/ of the nom. sg. masc. of the long form of adjectives appears in Russian showing the regular development to [-oy -jey] /oy -joy/, but in Byelorussian as [-iy -jiy] /-iy -jiy/ : GR : **sjljæpóy* /sjljæpoy/ **stároy* /stároy/; R. /sjljipóy, stáray/, but BR. *sjljepiy*, *stáriy*. This cannot be a phonetic change since a similar ending [-jĭy] /-jəy/, the gen. pl. of an i-stem noun, shows the regular development both in Russian and Byelorussian : GR. **kostey* /kosjtjoy/, BR. *koscjey*, R. /kósjtjiy/. It seems likely, then, that the adjective ending is either a borrowing from Church Slavic or a spelling pronunciation. Even Russian shows this spelling pronunciation in the speech of some people for this particular ending when unstressed. Thus R. /sjljipóy/ represents the regular development, but the unstressed form appears in two versions, R. [rúskəy] /rúskay/, which represent the regular development of the ending, and R. [rúsjkjiy] /rúsjkjiy/, which is a spelling pronounciation. The Russian writing system writes this ending as if it represented [-iy -jiy] /-iy -jiy/ when unstressed, a writing that is inconsistent with the rest of the writing system and is borrowed from Church Slavic.

4.4.2 *Development of* [iy iy]

The combinations [-iy -jiy] /-iy -jiy/ become [-oy -jey] /-oy -joy/, that is the vowels [i i] coalesce with the vowels [o e] in position before [y]. Phonemically /i/ in position before /y/ coalesces with /o/. This change takes place in GR but not in either BR or Uk, and is hence one of the changes producing the split in Proto-Russian. Examples are : PESl. **miyu* /miyu/, 'I wash', **kriyu* /kriyu/ 'I cover', **pjiy* /pjiy/, 'drink !', **bjiy* /bjiy/ 'hit !'; Uk. *mıyu*,

krıyu, pıy, bıy; BR. *miyu, kriyu, pjiy, bjiy*; GR. *moyu, kroyu, pjéy, bjéy.*

CHERNYX, *IGRY* 109–11, treats this change along with that of [–ŭy –jĭy] /–əy –jəy/, assuming that [–ŭy –jĭy] first became [–iy –jiy] in all the East Slavic languages and then this [–iy –jiy] became [–oy –jey] in Great Russian. There is some indication of this in manuscripts, although this evidence is not very conclusive since this is a point where even the modern writing system of Russian is not consistent, cf. # 4.4.1. Moreover, the statement that [–ŭy ĭy] became [–iy –jiy] can be maintained only on the basis of the nom. sg. masc. long form of adjectives, since a similar ending in the gen. pl. of *i*–stem nouns did not undergo this development in Ukrainian and Byelorussian. It seems more reasonable to assume that in GR [ŭ ĭ] underwent the regular development before [y] as elsewhere, that [ı i] before [y] underwent a special development in GR and that the nom. sg. masc. long form of adjectives shows a borrowed form or a spelling form in Ukrainian and Byelorussian and sometimes also in Russian (cf. #4.4.1).

4.4.3 [š ž] *become non–palatal*

The consonants [š ž], which had been palatal consonants since their origin, lose their palatal character. This change does not affect their phonemic status; they are still /š ž/. The phonological system is affected only in that these phonemes must now be classified as non-palatal consonants rather than palatal consonants. This change shows up in manuscripts by the occurrence of the writing *živite* instead of *živite*, of *deržitŭ* instead of *deržitŭ*. This means that after [š ž] the back allophone [ı] of the phoneme /i/ now appears instead of the front allophone [i]. Presumably the back allophones of /u/ and /a/ also now occur after [š ž]. The phoneme /æ/ may not occur after [š ž] and the phoneme /o/ represents a special case (cf. 4.4.4). This change did not take place in BR, a matter that will be

discussed further in the following section, and hence contributes to the split of Proto-Russian.

4.4.4 [e] *becomes* [o]

The phone [e] when followed by a non-palatal consonant or when final becomes [o]. Where C stand for a non-palatal consonant and Cj for a palatal consonant, the distribution of [e] and [o] all the way from PSl. to PR. may be represented as follows : Cj*e*Cj Cj*e*C *C*oCj *C*oC. After this new change the distribution becomes : Cj*e*Cj Cj*o*C *C*oCj *C*oC. Since [e] does not occur in initial position, [e] and [o] are still in complementary distribution and this change is not a phonemic change. Phonologically there is, of course, a change in the distribution of allophones. Examples of this change are : PR. *[sjéla] nom. pl. of 'village', [sjéstri] nom. pl. of 'sister', *[sjestrá] 'sister', *[idjém] l. pl. of 'go', *[čérnoy] 'black', *[moyé] nom. sg. n. of 'my', *[mórje] nom. sg. of 'sea', *[plječé] 'shoulder, become PGB. *[sjóla], *[sjóstri], *[sjostrá], *[ijdjóm], *[čórnoy], *[moyó], *[mórjo], *[plječó]. This change must have taken place after [ĭ ŭ] became [e o], because [e] from [ĭ] also undergoes this development : PSl. *[šĭdlŭ] > PR. *[šel] > PGR. *[šol].

From the point of view of Standard Modern Russian, it would seem that this change took place only in stressed syllables. There is, however, evidence that originally the change took place in both stressed and unstressed syllables, and then later in Standard Russian the effect of akanye was to wipe out the effects of this change in unstressed syllables. In North Great Russian, where akanye did not take place, [o] appears in both stressed and unstressed syllables : *žoná* 'woman', *sjostrá* 'sister', *vjosná* 'spring', *pjok* 'cooked' and *pjokú* 'I cook'. There is no satisfactory evidence for this point from the manuscripts, as would be expected since this change is subphonemic. Rather than assume, then, that in some places the change

took place only in stressed syllables and in the north took place in both stressed and unstressed syllables, the simpler assumption that it took place everywhere in both stressed and unstressed syllables will be adopted here.

The consonants [š ž] must have become non-palatal (cf. # 4.4.3) before this change took place, because [e] becomes [o] before these consonants just as it does before other non-palatal consonants : R. /grabjóš/ 'robbery, plunder', /djóšiva/ 'cheap', /idjóš/ 'you (sg) go', although this last example could be analogical with /idjóm/ 'we go'. It may be noted here that [c] did not lose its palatal character before this change since there are forms like /atjéc/ 'father', /kupjéc/ 'merchant', where [e] did not become [o] as it would have if [c] had already been non-palatal. If, then, [š ž] become non-palatal before [e] > [o], the back allophone of /o/ would be expected to occur after [š ž] just as the back allophones of /i u a/ occur after [š ž] (cf. # 4.4.3). Since [e] is the front allophone of /o/ and [o] is the back allophone, it is assumed here that the replacement of the front allophone [e] by the back allophone [o] in position after [š ž] when these last lose their palatal character is the starting point for the change of [e] to [o]. If this is so, it should be noted that a following palatal consonant inhibited the change of [e] to [o]; PR. *[šel] 'went' > PGR. *[šol], but PR. *[šesjtj] 'six' remains *[šesjtj]. This inhibition establishes the pattern that [e] becomes [o] before non-palatal consonants, and then [e] in this position develops into [o] after consonants other than [š ž]. If [e] became [o] first after [š ž] which were the only non-palatal consonants without palatal counterparts (excluding /k g x/ after which [e] could not occur), and second after [č c y] which were the only palatal consonants without non-palatal counterparts, and then lastly after all the palatal consonants that had non-palatal counterparts, this would explain not only how the change originated but also why this change appears in Ukrainian only after the

consonants [š ž č c y]. Uk. /šostɪy/ 'sixth', /šovk/ 'silk', /žovtɪy/ 'yellow', /čolovik/ 'man', /yoho/ gen. sg. m. of 'he'. The earlier part of the change, after the consonants [š ž č c y], spread farther, namely into Ukrainian, than did the later part of the change after other palatal consonants.

This change is also found in Byelorussian, but with the exception that it does not appear when [e] occurs before [š ž] : BR. /hrabješ/ 'robbery', /djzješiva/ 'cheap', /adjzješa/ 'clothing'. This indicates that [š ž] had not lost their palatal character in BR but had in GR, and that GR, rather than BR, is a more reasonable place for the starting point of this change since there would be no reason for [e] to develop into [o] after [š ž] in BR if these are still palatal consonants, whereas in GR there is a reason for the development. It is not necessary to be able to show a reason for a phonetic change, but when, as here, a reasonable explanation can be made, it might as well be stated.

The whole development may be summarized and charted as follows. The distribution of [e] and [o] in PGrR may be represented by the following chart :

After paired consonants	After [š ž]	After [č c y]
CoC		
CoCj		
CjeC	šeC	čeC
CjeCj	šeCj	čeCj

First [e] developed into [o] in Great Russian territory in position after [š ž], triggered by the fact that [š ž] had just lost their palatal character. This change is inhibited when the [e] is followed by a palatal consonant, producing the following distribution :

CoC	šoC	
CoCj		
CjeC		čeC
CjeCj	šeCj	čeCj

The inhibition of the development before a palatal consonant established the pattern that it was the following non-palatal consonant that was the determining feature in the development of [e] to [o] and not the preceding [š ž]. Next, [e] after [č c y] (which were the only other non-paired consonants after which [e] could occur) and followed by a non-palatal consonant underwent the same development to [o]. These changes spread throughout East Slavic territory, including Ukrainian and Byelorussian in spite of the fact that [š ž] were still to be classed as palatal consonants in these languages. This change produced the following distribution :

CoC	*šoC*	*čoC*
CoCj		
CjeC		
CjeCj	*šeCj*	*čeCj*

Lastly, [e] after other palatal consonants and followed by a non-palatal consonant also developed into [o], but in this case the development spread only throughout Great Russian and Byelorussian territory. The distribution of [e] and [o] produced was the following :

CoC	*šoC*	*čoC*
CoCj		
CjoC		
CjeCj	*šeCj*	*čeCj*

By these developments the status of the phonemes [š ž] is somewhat ambiguous. To some extent they pattern like palatal consonants and to some extent like non-palatal consonants. Their distribution follows that of non-palatal in the following situation :

1. they are followed by back allophones of /i u a/.
2. they are followed by the back allophone of /o/, but only if the latter is in turn followed by a non-palatal.
3. they are preceded by the back allophone of /o/.

Their distribution is that of palatals in the following situation :

1. they are followed by the front allophone of /o/, but only if the latter is in turn followed by a palatal.

This ambiguity of patterning of /š ž/ comes right down to modern Russian. The earlier distribution discussed above is still reflected in two phonological features of the present-day distribution. First, they are still followed by the back allophones of /i u a/, as well as of /o/, as is the case with non-palatal consonants. Second, the phoneme /e/ may occur after /š ž c/, but otherwise may occur only after palatal consonants with the exception of a few late borrowings like /madelj/ 'model'. They also ratain to the present some morphological characteristics which reflect their very early character as palatal consonants. Thus, masculine nouns ending in /š ž/, like those ending in a palatal consonant, add the allomorph /ey/ in the genitive plural, whereas other masculine nouns add the allomorph /ov/. Also, feminine nouns that have a nominative form ending in a consonant, may end in /š ž/, but otherwise may only end in a palatal consonant.

The loss of palatalization of [š̆ ž̆] in Great Russian and the devolopment of [e] into [o] in position after palatals and [š̆ ž̆] and before non-palatals, including [š̆ ž̆], constitute a difference in development between Great Russian and Byelorussian, but since neither of these developments is phonemic, the split thus produced is not very significant.

4.4.5 *Analogy*

The preceding change, [e] becomes [o] before non-palatal consonants, produces morphemes that have one allomorph with [o] and one allomorph with [e]. By analogy with forms that have vowels other than /o/, where no such alternation occurs, in some cases these forms change [e] to [o] in the allomorphs with [e] before palatal consonants. Thus, instead of an expected /tjótka, *tjétji/

modern Russian has /tjótka, tjótji/, instead of /zjiljónay, *zjiljénjinkay/ it has /zjiljónay, zjiljóninkay/ and instead of /bjirjóza, *bjirjézji (loc. sg.) /it has /bjirjóza, bjirjózji/. Also in verb forms by analogy with the allomorphs/iš, it, im, itji/, instead of the expected /ošj *etj om,*etji/ modern Russian has /oš, ot, om, otji/ [2]: /idjóš, idjót, idjóm, idjótji/. The analogy also works in reverse sometimes, so that [e] occurs before non-palatal consonants by analogy with forms that have [e] before palatal consonants : /atmjéstka/ 'revenge' from /mjésjtj/, /ščélka/ 'crevice' from /ščélj/. Although many of these latter forms could be explained by assuming that the following palatal consonant did not lose its palatalization until after [e] had become [o] before a non-palatal, the result, namely that forms with [e] occur after a palatal and before a non-palatal consonant, is the same by either explanation. It may be noted here that this is a case of allophonic analogy, not phonemic analogy.

The effect of this change is to put [e] and [o] in contrast with each other. Where formerly the distribution of [e] and [o] could be stated as follows : *CjeCj CjoC CoCj CoC*, we now have two new positions to add to these : *CjoCj CjeC*. Whereas the change of [e] to [o] before non-palatal consonants produced no phonemic change, this analogical change causes the phoneme /o/ to split into two phonemes /e/ and /o/. At this stage the language has six vowel phonemes, /i u o a e æ/, of which four, /i u o a/, may occur after either palatal or non-palatal consonants, and the other two, /e æ/, may occur only after palatal consonants. The phonemes /š ž/ retain their ambiguous status (cf. # 4.4.4) in that /e/ may occur after /š ž/ but /æ/ may not.

It was stated earlier that proto-Slavic could be analyzed as having the phoneme /o/ with allophones [e o], although there were alternative analyses, and that Proto-East-Slavic must be analyzed as having the phoneme /o/ with allophones [e o]. It is worth noting by way of an aside at

this point that the modern Slavic languages all show this phoneme split into two phonemes, /e/ and /o/, but that the process of split is different for the various languages. Thus in Russian the contrast between [e] and [o] is produced by the analogical development discussed in this section, but in Ukrainian the contrast is produced by the loss of palatalization of the preceding consonant. Thus a PESl. **sŭn* /sən/, **pjĭs* /pjəs/ > **son* /son/, **pjes* /pjos/ which with loss of palatalization becomes modern Uk. /son, pes/.

4.4.6 *Summary*

Proto-Russian is split into Byelorussian and Proto-Great-Russian by a small number of innovations on the part of both branches. The resultant Proto-Great-Russian has six vowel phonemes, /i u o a e æ/, of which the last two may occur only after palatal consonants. The consonant system has not been changed, except that the phonemes /š ž/ have developed an ambiguous status with respect to whether they should be classified as palatal or as non-palatal consonants, although they are classified as non-palatal here since they are phonetically non-palatal and in some of their occurrences agree with those of non-palatal phonemes.

4.5 *Development to Modern Standard Russian*

Proto-Great-Russian splits into two dialects, North Great Russian and South Great Russian. Besides these dialects, there is a third, Middle Great Russian. This last dialect is not independent in its devlopment in the sense that it arose on account of innovations on its part that separated it from the other two dialects. It is basically a transition dialect, a dialect formed because certain innovations in SGR spread over this central territory and certain other innovations of NGR also spread over this central territory with the result that it shows characteristics of both of the main dialects. It is from this dialect that the

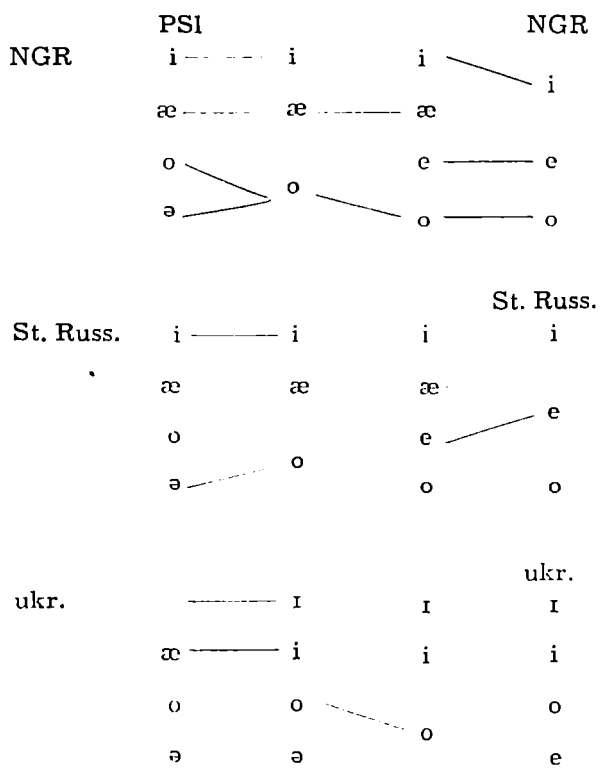
standard Modern Russian has developed. Since it is the purpose here to state the development of Modern Standard Russian, all of the developments of NGR and SGR will not be discussed nor will the various subdivisions of these main dialects, but only those developments that are in some way pertinent to the development of the standard language.

4.5.1 [æ] *becomes* [e]

The phone [æ] becomes [e] coalescing with the [e] that had arisen from the split of the phoneme /o/. As mentioned above, # 4.3.2–3, [æ] may much earlier than this have become phonetically [e], a high-mid front vowel, but if it did it was always until now kept distinct from what has been written here phonetically as [e], the front allophone of /o/, which may have been a lower mid-front vowel, [ɛ]. This development means that phonemically /æ/ and /e/ coalesce as the phoneme /e/ : PGR. /ljæto /ljæto/ 'summer' > *ljeto* /ljeto/; **sjvjæt* /sjvjæt/ > *sjvjet* /sjvjet/. This reduces the inventory of vowel phonemes to five /i u o e a/, of which /e/ may only occur after palatal consonants and /š ž/, but the others may occur after either palatal or non-palatal consonants. These are the vowel phonemes of modern Russian, although at this stage they may all occur either stressed or unstressed, which is not true of modern Russian.

This development is one of SGR which spreads to MGR and is thus found in the standard language. In NGR [æ] becomes in some dialects [i] and in other dialects a high-mid front vowel which may be written [ê]. In the dialects where [æ] becomes [i], it coalesces with the earlier [i], and in the dialects where it becomes a high-mid front vowel [ê] it is kept distinct from the earlier low-mid front vowel [e]. Thus for PSl. /ljæto, bjæləyə/ 'summer', 'white' NGR has either /ljito, bjiloy/ or /ljêto,

bjêloy/ where standard Russian has /ljéta, bjélay/. It may be noted here that these developments are all different from the one discussed above, # 4.3.2–3, for Ukrainian. In some NGR dialects /æ/ is kept distinct from PSl. /i/ and /o/, and in some NGR dialects /æ/ coalesces with PSl. /i/. In standard Russian /æ/ coalesces with the PSl. front allophone of /o/, although it must have done this after PSl. /o/ and /ə/ coalesce. In Ukrainian, although /æ/ becomes [i], it does not coalesce with PSl. /i/, but coalesces with PSl. /o/ in a closed syllable, but must do this before PSl. /o/ and /ə/ coalesce.



The change of [æ] to [e] must have taken place after [e] becomes [o] before non-palatal consonants because [e] from [æ] does not become [o] in this position. There are a few apparent exceptions to this rule : /gjnjózdi/ nom. pl. of 'nest' from PSl. /gjnjæzdi/ and R. /zjvjózdi/ nom. pl. of 'star' from PSl. /gjvjæzdi/, but these may very well be analogical on the basis of the pattern :

$$\frac{\text{/sjistrá/sg.}}{\text{/sjóstri/pl.}} = \frac{\text{/zjvjizdá/sg.}}{\text{x}}$$

producing /zjvjózdi/pl. for x.

This change could have taken place before the analogical extension of [o] to position before palatal consonant, # 4.4.5, or it could have taken place later. There is negative evidence that it took place later, and although this is not satisfactory evidence, it is better than none. The negative evidence is that, if [æ] had become [e] before the analogical extension of [o] to position before palatal consonants, then some cases of analogical extension of [æ] to [o] also might be expected, i. e. the following analogy might be expected to have operated occasionally :

$$\frac{\text{njebje}(<\text{njębjæ})}{\text{njobo}\ (<\text{njebo})} = \frac{\text{ljetje}\ (<\text{ljæ tjæ})}{\text{x}}$$

where x would equal *ljoto (< ljæto), but this never occurs. On the basis of this admittedly not very satisfactory evidence, unless contrary evidence can be adduced, the following chronology is adopted here : first [e] > [o] before non-palatal consonants, # 4.4.4; second [e] > [o] in some forms before palatal consonants by analogical extension, # 4.4.5, and lastly [æ] > [e]. It might be noted here that, if [æ] should have become [e] before the analogical extension, that it is this change and not the the analogical extension that produces the split of the phoneme /o/ into the two phonemes /e/ and /o/.

4.5.2 *The combinations* [ki gi xi]

The combinations [ki gi xi] undergo a change with respect to both of their members, the consonants becoming palatalized and the vowel becoming a front vowel : [kji gji xji]. Since palatalization is considered a significant feature for other consonants it may be so considered with respect to these consonants and we may phonemicize [kji ka ko ku] as /kji ka ko ku/. If this phonemicization is adopted, then the phoneme /kj/ may occur only before /i/ and the phoneme /k/ before /u o a/, in clusters and finally. On the other hand, since [kj] and [k] contrast with each other in no position, they may be considered as allophones of the same phoneme and [kji ka ko ku] may be phonemicized as /ki ka ko ku/. The choice is arbitrary. The latter phonemicization is adopted here. Since it is not necessary to adopt the phonemicization /kji/, this change is not a phonemic change, regardless of which phonemicization is adopted.

This change is noted in the manuscripts by writings *ki* instead of the earlier writings *ki*. In Moscow documents of the 14th century the writing *ki* has become the commno one. The change started in the South and moved northward, as indicated by documentary evidence (Chernyx, *IGRY*, 126–8), although the change may have occurred earlier than it appears in the documents.

The combination [kje] occurs in modern Russian and like [kji] may be phonemicized as /kje/ or as /ke/. In this case also the /ke/ alternative will be adopted. This combination arises from two sources, neither of which is a phonetic change. First, it occurs in borrowings like /késarj/ 'Caesar' and /yivángjiljiya/ from earlier */yevangjeljiye/ 'gospel'. Secondly, it develops from an analogical change. Morphemes that have an allomorph ending in [k] and an allomorph ending in [c], on the analogy of forms that do not show this alternation, replace this alternation in favour of the more frequent forms in [k]. This produces a [k] in front of a vowel [e] and the [k] is palatalized to give the

combination [kje]. Thus earlier **ruka* /ruka/, loc. *ruce* /ruce/ become R. *ruká* /ruká/, *rukjé* /ruké/ and **noga* /noga/, loc. *nozje* /nozje/ become R. *nagá* /nagá/, nagjé /nagé/. Usually analogical changes are sporadic, but this is an example of an analogical change that is not sporadic since all examples of the morphophonemic alternation between /c/ and /k/ that occurred earlier in the locative singular as opposed to other cases are wiped out by this analogical change.

4.5.3 [c] *becomes non-palatal*

As pointed out in # 4.4.3 the phones [š ž] lost their palatal character before the change of [e] to [o] in position before non-palatal consonants, but [c] did not. Now [c] loses its palatal character. This is a phonetic change only, and does not in any way affect the phonemes of the language, although from now on [c] must be classified as a non-palatal consonant rather than a palatal one. When [c] loses its palatal character, the allophones that may follow it become back allophones which persist down to the modern language. This change has taken place in the standard language by the 16th century.

4.5.4 *The phoneme /f/*

The phonemes /f fj/ in modern Russian arise from two sources. First, with the loss of the phoneme /ə/ in weak position, the phones [v vj] may occur in final position or before a voiceless consonant. When these occur followed by a voiceless consonant (cf. # 4.2.7), they are assimilated with respect to palatalization and also with respect to voice, producing [f fj], When they occur finally (cf. # 4.3.5) they are unvoiced to [f fj]. Neither of these changes in themselves constitute a phonemic change, but merely produce two allophones [f v] for the phoneme /v/ and [fj vj] for the phoneme /vj/ : *djefka* /djevka/ 'girl', *ftoroy* /vtoroy/ 'second', *fjsjo* /vjsjo/ 'all' and *krofj* /krovj/ 'blood'.

The second source of [f fj] is from borrowings. These are sometimes of Greek origin, R. /fjilasóf/ 'philosopher', sometimes from Latin, R. /fákt/ 'fact', and sometimes of West European origin, R. /afjicér/ 'officer', /faso'n/ 'fashion'. It is only with the introduction of these borrowings that a contrast between [f] and [v] or between [fj] and [vj] occurs and the phoneme /v/ is split into /f/ and /v/ and also the phoneme /vj/ spilt into /fj/ and /vj/. Thus the words cited above of Slavic origin are in modern Russian, /djéfka, ftaróy, fjsjó, krófj/. This discussion is introduced at this point merely to show how the phonemes /f/ and /fj/ are introduced into modern Russian and no attempt is made to place this development chronologically since it is not a significant development with respect to the relationship of the various Slavic languages.

4.5.5 *The phone* [g]

The phone [g] in SGR becomes a fricative [ɣ]. This is a point where modern Russian agrees with NGR in retaining the stop consonant. However, where PGR has the endings [-ogo -jego] in the gen. sg. masc. and neut. of long adjectives and of pronouns, modern Russian has an ending, /-óva, -avó, -ava, -iva, -ivó/. Chernyx, *IGRY* 184–5, suggests two possible explanations for this phenomenon. The first is a phonetic change, [ogo] > [oɣo] > [oo] > [owo] > [ovo]. In NGR there are dialects where this ending has a fricative [ɣ], even though elsewhere [g] has remained a stop, also dialects where the consonant has been completely lost leaving the ending [o:]. Also in some dialects a form like [pogost] has become [povost]. The main difficulty with this explanation as a phonetic change is that not all forms in [ogo, ego] have developed a [v] instead of the [g], *slogovoy* 'serving', *dorogo* 'dear'. The second explanation is an analogical change based on the gen. sg. masc. of adjectives ending in [-ov] with a gen. sg. [-ova]. Supporting this thesis is the

fact that some NGR dialects have for the pertinent ending [-ova -eva], /dóbrova, sjljepóva, sjínjeva/ 'good, blind, blue'. Since these dialects are okanye dialects, these endings look like the gen. sg. of the possessive adjectives in [-ov]; if this had been a regular change of [g] to [v] the forms should have been *dóbrovo, sjljepóvo, sjínjevo/. I have not been able to find out what these dialects have for modern Russian /adnavó/ 'one' and /mayivó/ 'my', but if they have */moyevá, odnová/, then this thesis of CHERNYX would be very strongly supported.

4.5.6 *Third person ending of verbs*

The third person ending of the present of verbs in OB. was -tŭ /tə/, *nesetŭ* /njosjotə/ 'he carries', *nesǫtŭ* /njosǫtə/ 'they carry'. The same ending in the oldest Russian documents is -tĭ /tj/, *nesetĭ* /njosjotj/, *nesutĭ* /njosutj/. In modern Russian the ending is *-t* /t/, /njisjót, njisút/. In PIE the ending is [-ti], **bhereti* /bherety/, *bheronti* /bheronty/. Since the OB ending could come from PIE **tu* but not **ti*, the OB ending cannot be a direct continuation of the PIE ending, but must represent some innovation on the part of OB. Moreover, the modern Russian ending cannot have developed from the same form as OB because the documentary evidence indicates that Old Russian had an ending of the palatalized variety, -tĭ /tj/. It would seem then, that for PSl it is necessary to assume an ending *[tji] /tjə/, which is replaced in OB by another ending, but continues into PESl as /tjə/. Since Uk. and BR both show an ending, in [-tj], this ending must have continued into PGR. Most SGR dialects show the ending [-tj] if they show any consonantal ending at all, and most NGR dialects show an unpalatatized ending [-t]. It would seem then, that the ending of the standard language derives from NGR.

The problem here is how to explain the loss of palatalization in NGR and in the standard language, considering

that this change is limited to a specific morphological position. Several explanations have been offered. One is that this is a phonetic change; final [-tj] loses its palatalization. In the case of this change analogy inhibits it in paradigms where a final consonant is palatal; thus a form like Russian /kósjtj/ 'bone' retains its final palatal consonant because of the other forms in the paradigm where the palatal consonant is not final, /kósjtji/ gen. dat. or loc. sg., /kósjtjyu/ inst. sg., etc. The main difficulty with this explanation, as CHERNYX has pointed out, *IGRY* 216, is that it fails to explain forms like R. /yésjtj/ 'there is', /apjátj/ 'again' /čútj/ 'hardly, almost', where the final palatal consonant could not be protected by analogy since there are not any other related forms with a vowel following the /tj/. The validity of this explanation would be considerably enhanced if, instead of being strictly limited to verb forms, it also occurrd in some forms that are not verb forms and that would not be affected by analogy,

Another explanation, given by CHERNYX, *IGRY* 216-7, and called by him 'homonymous dissimilation' (*omoničeskoe ottalkivanie*), is that the loss of palatalization occurs by way of contrasting the third sg. or third pl. form of the verb with the infinitive form of those verbs that would otherwise have an identical third sg. and infinitive or an indentical third pl. and infinitive. Then this loss is spread to those verbs that would not have these forms similar anyway: R. /gavarítj/ 3 sg. or infin., /djvjínutj/ 3 pl. or infin., or with an older stress position for the 3. sg.: /palučítj/ 3 sg. or infin. This theory is supported by the fact that some NGR dialects that do have a final palatalized [-tj] have it in the 3 pl. of those verbs that distinguish the 3 sg. or 3 pl. from the infinitive, thus [njesjútj] 3 pl. but [njesjtjí] infin. Probably the main difficulty with this explanation is that it is not one of the well recognized types of linguistic change, phonetic change, analogical change or borrowing. The assumption is that when two different

morphemes become homonymous in some forms, one of them may undergo a change just because they are homonymous, a dissimilation of homonymous morphemes. This is a marginal type of linguistic change that will have to be considered questionable until further evidence in support of it has been discovered.

4.5.7 *Unstressed vowels*

According to the statements that have been made so far the following vowel phonemes and allophones may be posited for the Russian of this period : /i/ [i i], /u/ [ü u], /o/ [o], /e/ [ɛ], /a/ [æ a]. All vowels occur in both stressed and unstressed syllables, and where more than one allophone has been indicated, the first occurs in position after palatal consonant and the second after non-palatal consonant. In modern Russian the phoneme /o/ has a fronter allophone after a palatal consonant than after a non-palatal and we might indicate this as follows : /o/ [ö o]. These allophones presumably develop when [e] becomes [o] before non-palatal consonants, # 4.4.4, but could have developed later. The phoneme /e/ may occur only after palatal consonants until, due to some relatively recent borrowings, R. /madél,/ 'model', it is introduced also after non-palatal consonants. In modern Russian this phoneme /e/ has a higher allophone, [e], before a palatal consonant and a lower allophone, [ɛ], before a non-palatal consonant. It is not possible to tell at what period these allophones developed, but it could have been at any time after /e/ became an independent phoneme. This stage of vowel phonemes and allophones comes down to modern Russian as far as stressed syllables are concerned, but changes occur in unstressed syllables. The particular changes depend mainly on whether the unstressed vowel occurs after a palatal or after a non-palatal consonant but in general it may be said that all unstressed vowels become centralized to some extent.

In unstressed position after a non-palatal consonant the following changes take place : [i] becomes a lower vowel [ɪ], [u] becomes a lower vowel [ʊ], [o] and [a] fall together in pretonic position as [ʌ], and in other unstressed positions as [ə], and insofar as [ɛ] is introduced in borrowed words in this position it falls together with [ɪ] : [dišátj] > [dɪšátj] 'to breathe', [dušá] > [dʊšá] 'soul', [vodá] > [vʌdá] 'water', [vraga] > [vrʌgá] 'enemy', [gorodá] > [gərʌdá] pl. of 'city', [samovár] > [səmʌvár] 'samovar'; [vódi] > [vódɪ] n. pl. of 'water', [rúku] > [rúkʊ] acc. sg. of 'arm', [slóvo] > [slóvə] n. sg. of 'word', [slóva] > [slóvə] gen. sg. of 'word' and in borrowed forms, [ɛtáš] > [ɪtáš] 'floor, storey'. In the speech of some people, [o] and [a] coalesce as [ʌ] in initial position as well as in pretonic position, [ʌtkrɪvátj, sʌmʌvár], but [ʌ] and [ə] do not contrast with each other. These changes produce in unstressed position after a non-palatal consonant a three-way contrast of [ɪ ʊ ʌ] in pretonic position, or for some speakers in pretonic and initial position, and a three-way contrast of [ɪ ʊ ə] in other positions. There are then in this position only three phonemes, and, either on the basis of phonetic similarity or on the basis of assigning them to the three most extreme of the stressed phonemes, we may assign [ɪ] to /i/, [ʊ] to /u/ and [ʌ ə] to /a/. Stated in phonemic terms in unstressed position after a non-palatal consonant the phoneme /u/ remains, the phonemes /o/ and /a/ fall together as /a/ and the phonemes /e/ and /i/ fall together as /i/. The forms cited above would be phonemically : /dišátj, dušá, vadá, vragá, garadá, samavár, vódi, rúku, slóva, slóva, itáš, atkrivátj/.

In unstressed position after a palatal consonant the following changes occur : [i o ɛ æ] all coalesce as [ɪ], [ü] remains or is slightly lowered : [ljicó] > [ljɪcó] 'face', [sjostrá] > [sjɪstrá] 'sister', [rjɛká] > [rjɪká] 'river., [pjætjí] > [pjɪtjí] gen. sg. of 'five', [ljübjljü] > [ljübjljü]' An exception to this general statement is that in final position

after [y], although [i] becomes [ɪ], [o a ɛ] fall together as [ə] : [kráyi] > [kráyɪ] nom. pl. of ' border ', [molodí'yɛ] > [məlʌdi'yə] nom. pl. of ' young ', [molodóyo] > [məlʌdóyə] nom. sg. n. of ' young ', [molodáya] > [məlʌdáyə] nom. sg. f. of 'young'. There is then a three-way contrast of [ɪ ə ü] in unstressed position finally after /y/ and a two-way contrast of [ɪ ü] in all other unstressed positions after a palatal consonant. We may assign the allophones as follows: [ɪ] to /i/, [ü] to /u/ and [ə] to /a/. Phonemically, in final unstressed positions after /y/ the phonemes /i u/ remain, and /o e a/ coalesce as /a/, and in all other unstressed positions after a palatal consonant the phoneme /u/ remains and the phonemes /i e a o/ coalesce as /i/. The forms cited above are phonemically /ljicó, sjistrá, rjiká, pjitjí, ljubljú, kráyi, maladíya, maladóya, maladáya/.

This centralization of unstressed vowels in the standard language is in general characteristic of SGR, although there are a number of different variations in these changes in different SGR dialects. NGR generally retains the stressed vowels in unstressed position.

These changes produce the phonological system of modern Russian. There are five vowel phonemes, /i u e o a/ all of which may occur in stressed position, but only three, /i u a/, in unstressed position after a non-palatal consonant or in final unstressed position after /y/ and only two, /i u/ in other unstressed positions. There are, of course, variations in the speech of people who speak the standard language, some of which have been mentioned during the course of the previous discussions and will not be repeated here. There are also other minor variations that have not been mentioned. One that may be noted just by way of illustration without any attempt to be exhaustive is that some speakers have [ɛ] in unstressed position in borrowed words like [ɛtáš] where we have cited the pronunciation [ɪtáš] and for these speakers the phonemes in unstressed

position would be somewhat different from the preceding statement.

4.5.8 *Morphophonemics*

The subject of morphophonemic alternation has not been discussed previously but the centralization of unstressed vowels produces a systematic phonologically conditioned morphophonemic alternation of vowels that is worth while noting :

Morphophoneme	*Phoneme*		
	Stressed	*Unstressed*	
		After non-palatal or final after /y/	After palatal otherwise
I	/i/	/i/	/i/
E	/e/	/i/ (rare)	/i/
A	/a/	/a/	/i/
O	/o/	/a/	/i/
U	/u/	/u/	/u/

If the morphemes of the language are stated in morphophonemic terms, the morphology of the language can be stated in much simpler form than the usual traditional statements. The division of nouns and adjectives, for example into soft and hard (or palatalized and non-palatalized) classes has no basis in the morphophonemics of the language. Morphophonemically the nom. sg. ending of neuter nouns (excepting types like /ímji/ 'name' etc.) is -O, which means that the ending, if stressed, has the phonemic shape /o/ either after a non-palatal, /aknó/ 'window', or after a palatal. /žitjyó/ 'life', if unstressed after a non-palatal has the phonemic shape /a/, /slóva/ 'word', and if unstressed after a palatal has the phonemic shape /i/, /mórji/ 'sea'. The other inflectional morphemes can be stated similarly. The gen. sg. masc. or neut. morpheme added to an adjective stem morphophonemically *-OvO*, which means phonemically /óva/ if the first vowel

of the ending is stressed, /maladóva/ (there is no /óva/ after a palatal consonant since the stress never falls in this position with stems ending in a palatal consonant), /ava/ if the stem is stressed and ends in a non-palatal, /krásnava/, /iva/ if the stem is stressed and ends in a palatal, /sjínjiva/, /avó/ if the last vowel of the ending is stressed and the stem ends in a non-palatal, /adnavó/, and /ivó/ if the last vowel of the ending is stressed and the stem ends in a palatal, /mayivó/. There are some cases where, even though a number of allomorphs is subsumed under one form stated morphophonemically and hence phonologically predictable, it is still necessary to set up more than one allomorph stated morphophonemically[3]. This occurs sometimes with stem morphemes : for example, it is necessary to posit both a *žOn-* and a *žEn-*, the form /žóni/ nom. pl. of 'wife' being descriptively derivable from the first allomorph, the form /žénskay/ 'feminine' being derivable from the second and the form /žiná/ 'wife' being derivable from either. This also occurs with inflectional morphemes : the gen. sg. fem. morpheme added to adjective stems is morphophonemically *-Oy* alternating with—*Ey*, /maladóy, krásnay/ deriving from the first /mayéy, fjsjéy/ from the second and /sjínjiy/ from either.

There are many other types of morphophonemic alternation, although since they are not phonologically predictable[4], they do not simplify the statement of the morphology.

4.5.9 *Summary*

In summary the modern Russian phonological system consists of five vowel phonemes, /i e a o u/. All of these may occur initially and also finally and medially after both palatal and non-palatal consonants, although /e/ is relatively rare after non-palatal consonants. Only /i a u/ may occur in unstressed position after non-palatal consonants or finally after /y/, and only /i u/ may occur in other

unstressed positions. The main allophones and their distribution is as follows :

/i/ [i] stressed after palatals and initially
[ɨ] stressed after non-palatals
[ɪ] unstressed

/e/ [e] stressed before palatals
[ɛ] stressed before non-palatals and finally

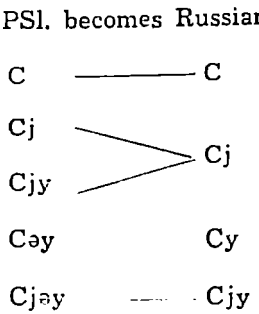
/a/ [a] stressed after non-palatals and initially
[æ] stressed after palatals
[ʌ] unstressed in pretonic position after non-palatals
[ə] in other unstressed positions after non-palatals and finally after /y/

/o/ [o] stressed after non-palatals and initially
[ö] stressed after palatals

/u/ [u] stressed after non-palatals and initially
[ü] stressed after palatals
[ʊ] unstressed after non-palatals and initially
[ʊ̈] unstressed after palatals

The consonant phonemes may be subdivided into a group classifiable as non-palatals, /p b m v f t d s z l n r k g x c š ž/, and a group classifiable as palatals, /pj bj mj vj fj tj dj sj zj lj nj rj čj y/. We have noted that /š ž/ (# 4 4.4) and /k g x/ (# 4.5.2) have an ambiguous status as non-palatal consonants. The same is true to a lesser extent of /c/ since the phoneme /e/ may occur after /c/ although it does not occur after the unambiguously non-palatal consonants except in some recent loanwords. Of the consonants that occur in a pair, one voiced and one voiceless, only the voiceless member may occur in final position. The combinations [šč] and [žj], introduced largely by borrowings from the Church language (# 4.2.2 footnote), may be considered as unit phonemes or as clusters. The phoneme /y/ may form a cluster with a preceding palatal consonant,

Cjy, or a preceding non-palatal consonant, *Cy*, making a four-way contrast, *C Cj Cy Cjy*. It may be noted that this is not in any way a continuation of the three-way contrast of Proto-Slavic, *C Cj Cjy*. The origin of the Russian contrasts may be tabulated as follows :



This development may be deduced from the statements that have already been made, but it has not previously been specifically stated.

All the main developments from PIE to modern Russian are included here as are many of the minor developments. It is hoped that everything that is of any significance for the historical phonology of Russian has been included, although it is recognized that a few sporadic developments that do not have any such significance have been omitted. By way of an illustrative example one of these may be mentioned. A svarabhaktic vowel has sporadically developed in some forms, PSl. /ognjə/ becomes R. /agónj/. This is connected with final occurrent consonant clusters, but the development is not in any way systematic.

FOOTNOTES

Chapter 2

1. In IE roots the voiced aspirates pattern like voiced or voiceless stops and not like clusters. It may also be noted here that pre-aspiration of the semivowels is not included in this discussion of PIE since it has no significance for Slavic.
2. There is one other position in which it might be useful in Slavic to admit the occurrence of a laryngeal, i. e., in initial position before a vowel (cf. # 3.7.1), but this is questionable.
3. Karl Brugmann and Berthold Delbruck, *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen*, 2 vols. 2d ed. Strassburg, 1897–1916.
4. A. Meillet, *Introduction à l'étude comparative des langues indoeuropéennes*, 8th ed. Paris, 1937.
5. Jerzy Kurylowicz, *E'tudes indoeuropéennes* 1. Cracow 1935, 1–26.
6. Meillet, *Introduction*, 91–5.
7. W. P. Lehmann, *Proto-Indo-Eurapean Phonology*, Austin 1952, 100–2.
8. W. Vondrak, *Slavische Grammatik*, 2 vols. 2d ed. Göttigen, 1924–28.
9. The symbol in IHL is /?/, but this was revised by Sturtevant in *Lang.* 24, 259–61 to /h/.

Chapter 3

1. T. Burrow, *The Sanskrit Language*, London, 1955, p. 13, suggests that the satem group of languages is a unitary group and that the centum group is not. He makes his statements in phonetic terms. In structural terms the evidence of the dorsals is difficult to interpret. If we

assume three dorsal phonemes, /k̂ k k^{w}/, then we have an innovation in the centum languages since /k̂/ and /k/ coalesce and also in the satem languages since /k/ and /k^{w}/ coalesce. From this point of view both groups are unitary, since both groups show innovations. If we assume two dorsal phonemes, /k/ and /k^{w}/, the former having two allophones [k̂] and [k], then the satem group shows an innovation since the back allophone of /k/ coalesces with the phoneme /k^{w}/, but the centum group merely continues to preserve the two phonemes distinct from each other. From this point of view BURROW's suggestion that only the satem group is unitary is supported. However, BURROW, p. 75–6, suggests that possibly all the forms for which the velar allophone or phoneme is reconstructed may really be due to dialect mixture. This would leave only two phonemes, /k/ and /k^{w}/, for PIE and both groups keep both phonemes distinct and there is no innovation on the part of either the centum or satem group. In this case the development of the dorsals can not be used to prove that either group is unitary.

2. The coalescence in Iranian must have been subsequent to the split of Indo-Iranian, unless this is to be construed as evidence that Iranjan is more closely related to Baltic and Slavic than to Indo-Aryan.

3. A. MARTINET, Concerning some Slavic and Aryan Reflexes of IE *s*, *Word* 7.91–5 (1951).

4. In stating the position in which PIE /s/ > /x/ it is customary to include the statement 'after k', but since the whole cluster developed into /x/, this development is here treated under consonant clusters, # 3.9.

5. This statement of TRAGER's analysis is based on conversations with him, although his analysis is partially stated in the article, G. L. TRAGER and H. L. SMITH Jr., A Chronology of Indo-Hittite, *SIL* 8.61–70 (1950).

6. MEILLET *SlCom.* 426 gives reasons for positing /e:n/ as the origin of the Slavic.

CHAPTER 4

1. In modern Russian there are many forms that have [šč] and [žj žd] deriving from forms with our reconstructed */tjy/ and */djy/ respectively. These are borrowings from the Church language. Thus [šč] is found in participles like R. /znáyuščiy/ 'knowing', although a few forms showing the regular devlopment have survived as other parts of speech, like R. /garjáčiy/ 'hot'. Many such borrowed forms occur among the verbs, thus the borrowed /asjvjitjítj asjvjiščú/ 'to illuminate', but the regularly developed /fjsjtjrjétjitj fjsjtjrjéču/ 'to meet', and the borrowed /praxladjítj praxlaždú/ 'to refresh', but the regular /vjídjitj vjížu/ 'to see'. This borrowed [šč žj žd] should not be confused with [šč] that developed regularly from *y*-palatalization of the clusters /sk/ and /sjtj/ or with the [žj žž] that developed regularly from *y*-palatalization of the /zjdj/: /iskátj iščú/ 'to look for', /pusjtjítj puščú/ 'to let go', yézjdjitj/ and /yézjžu/ or /yéžžu/ 'to go'.

2. For a discussion of the final consonant in the 3 sg. and 3 pl. cf. # 4.5.6.

3. We are not concerned here with morphemes that have phonologically quite dissimilar allomorphs, such as the gen. pl. morpheme that is added to noun stems, which has the allomorphs, /ø/, /Of/ and /Ey/.

4. The discussion here is concerned with morphophonemic alternation of vowels only. There is, of course, one example of phonologically conditioned morphophonemic alternation of consonants, the alternation of voiced consonants in medial position with voiceless consonants in final position.

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