Morphological change: towards a typology

1.0 There may not be any need to argue for the utility of a typology of innovations in morphology. Linguists concerned with historical morphology know that the various attempts that have been made to explain morphological change by means of half a dozen "laws of analogy" have met with very little success mainly because of the immense variety of kinds of change that need to be explained. And it stands to reason that it is premature to seek explanations of a class of phenomena before the full range and the diversity of the phenomena to be explained have been established. Still, at a time when taxonomies are in disfavour, it seems reasonable to begin a paper on the typology of change by clarifying the relationship between explanation and taxonomy in historical linguistics.

There can be no quarrel that historical linguistics is a nomothetic discipline, and that its ultimate aim is to understand language change by uncovering the lawlike connections between language states and the innovations they give rise to, to formulate generalizations which to the greatest possible extent explain linguistic innovations as necessary consequences of given linguistic facts.

This endeavour can only be based on a body of accurate accounts of actual linguistic innovations. This means, on the one hand, that data from languages whose history is known should be given preference over unattested changes between reconstructed language states. On the other hand, it means that the diachronic correspondences that can be defined between consecutive states of a language must be analysed and understood as the results of sequences of quite different — and quite differently motivated — innovations. One cannot hope to form valid generalizations except on the basis of innovations described and interpreted as real events.

Description and interpretation presuppose experience in the sense that they always, implicitly or explicitly, involve a comparison between the phenomenon to be interpreted and other known phenomena. To give a plausible account of some linguistic change one must know what innovations are possible under given circumstances. The aim of a typology of
linguistic innovations is to give a systematic presentation of our experience with kinds of innovation, a categorization of the possible which can be used both as a heuristic tool in investigating individual changes and as a framework for that sorting of our data which must precede any attempt to formulate laws of change.

1.0.1 The present paper is intended as a continuation of my report to the First International Conference on Historical Linguistics, Edinburgh 1974, "Towards a typology of change: Bifurcating changes and binary relations". In that report I defined a set of general criteria for a typology of linguistic change and showed that these are equally applicable to lexical innovations and phonological innovations. Incidentally it turned out that also specific classes of innovations in phonology correspond point by point to the classification of semantic changes proposed on entirely different grounds by Stern (1931).

As one turns from innovations in phonology and semantics to inflectional morphology, one might look to traditional surveys of analogical change in the hope of finding reflected in them some important criteria which could guide us towards a systematic understanding of morphological change. Unfortunately, neither in the work of the neogrammarians nor in more recent contributions to the study of analogy do we find important types of innovation defined with sufficient clarity to be helpful in this regard. The traditional distinctions between material and formal analogy (Osthoff 1879), neologism and remodelling (Brugmann 1906), expression changed to fit content and content changed to fit expression (Wheeler 1887), or proportional and non-proportional analogy (Hermann 1931) are of little or no value, for they are much too general.

An attentive reading of such detailed surveys of analogical change as Paul’s (1920), von der Gabelentz’s (1901), or Hermann’s (1931), or of the more specialized studies of Kuryłowicz (1949) or Mańczak (1957, 1958, 1963) will convince anyone that there are a great many quite diverse types of innovation in morphology. Individual examples discussed in these works illustrate important aspects of morphological change, but the discussions consistently lack analytic depth in essential respects, important distinctions are often overlooked or, where they are drawn in one example, their relevance for other examples is not recognized. A weakness shared by all surveys of analogical change to date has been a failure to define different types of development relative to one another. If one asks why this might be so, the answer will have to point to two major theoretical deficiencies in this area of investigation: the discipline has so far worked without an explicit theory of change and without an articulate theory of morphology.
1.1 The lack of a workable theory of synchronic morphology is undoubtedly the greatest obstacle for the student of historical morphology, for without an explicit conception of the nature of morphological structure, one cannot even adequately define the correspondences between successive states of a morphological system which are the raw material the language historian has to interpret. Without such a theory, of course, also an attempt to classify innovations in morphology may seem a doubtful undertaking. Still it is possible precisely through an attempt to define different types of innovation to gain some insight into the structure of a morphological system — or at least into some of the constitutive features of such a system.

In order to facilitate the discussion of the various types of innovation to be surveyed below, I will briefly mention some of the notions that I assume to be essential for the investigation of morphological change.

1.1.1 First a distinction must be made between change in morphology and change in morphophonemics. The term morphological change should be limited to changes in the relations among linguistic signs, whether relations among signata or among signantia. Morphophonemic change, by contrast, is change in the relations among variants of signantia (allomorphs) (Andersen 1969). Traditionally changes of both kinds have been referred to indiscriminately as analogical. This term is better avoided, for its meaning is so general as to make it applicable to the most various types of morphological and morphophonemic change and of no particular value in the discussion of most.

1.1.2 A central notion in a theory of morphology is that of the content sign, or morpheme, which can be understood as consisting of a signans (sign vehicle or means), a signatum (sign value or object), and a sign rule (cf. 1.1.5) establishing the relation between the two (cf. 1.1.4). Morphemes vary greatly according to the kinds of signantia, the kinds of signata, and the kinds of signatum–signans relations they comprise.

Different types of absolute signantia are to be distinguished. The distinction between zero and real signantia is traditional, but it seems likely that the historical linguist will have to recognize zero signantia under various circumstances where traditionally descriptivists would not postulate them (cf. 5.2.2). Real signantia can be direct (e.g. sentence intonation marking subordination or interrogative status), but typically involve both articulations of language being mediate, i.e. consisting of (combinations of) distinctive feature values or, as they will be called here, diacritic signs. Traditionally morphological analysis has operated with whole phonemes and phoneme sequences and has overlooked that
grammatical meaning can be expressed by single diacritic signs. The study of morphological innovations shows that the synchronic analysis must operate with the ultimate constituents of the expression systems, which are the diacritic signs (cf. Jakobson 1958, 1966; Huntley 1968; Leed 1970).

Furthermore, signantia can be relative, i.e. consist in the modification of a real signans (Isačenko 1975). Consonant gradation, apophony, accentual alternations, reduplication, and element inversion are typical examples. In synchronic analysis it may be difficult to determine whether an alternation is to be interpreted as morphophonemic (the alternants are co-variants of absolute signantia) or morphological (the modification of the signans is in itself a signans). Morphological innovations show that this dilemma may exist also for learners of a language.

1.1.3 Signata may be absolute. A distinction must be made between asynthetic signata, consisting of a single content element (e.g. ‘3rd person’ expressed by -t in Russ. s,ild,-l-t ‘(one) sits’, s,ild,-d-t ‘(some) sit’) and synthetic signata, combinations of content elements (e.g. ‘non-3rd person, speaker, singular’ expressed by -u in Russ. s,ild-ų ‘I sit’). Here, as in the case of signantia, the analysis must be pushed to its conclusion, and traditionally recognized content units such as cases and tenses must be analysed into features of grammatical meaning, that is, as synthetic signata. Otherwise the specialization of signans elements for classes of signata — such as, in the Russian declensions, -m(,) as a marker of peripheral cases (locative, dative, and instrumental) — cannot be described. Furthermore, only when such more general elements of grammatical meaning are recognized is it possible to understand similarities of expression between different specific categories as motivated, e.g. Engl. -z ‘plural’ (a quantifier descriptor, in Jakobson’s (1957) terminology) and -z ‘possessive’ (a quantifier connector).

Besides absolute signata one must recognize relative signata. In Russian, the nominal desinence -u is found in ascriptive non-quantifier cases (accusative and dative) and in non-ascriptive quantifier cases (genitive II and locative II). The historical development of this desinence makes it difficult to view this as an instance of accidental homonymy and reasonable to hypothesize here a syncretism among the cases sharing the value of ‘marked ascriptivity’. Similar considerations suggest that the identity of the signantia of the English -z ‘(substantival) plural’ and -z ‘(verbal) singular — again the result of a morphological innovation — may be motivated by their similar value of ‘marked quantifier descriptor’.

1.1.4 Morphological analysis must distinguish different types of sig-
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natum–signans relations. Linguistic signs are primarily symbolic (conventional, arbitrary), shifters (e.g. mood, tense, person, cf. Jakobson 1957) being symbolic-indexical (their signata include reference to the speech acts in which they are used) and onomatopoeia being symbolic-iconic (their signantia are similar to aspects of their referents). But to understand the relations among signs — in paradigms as well as in syntagms — purely iconic and purely indexical signatum–signans relations must be considered as well.

Relations of similarity among signantia may reflect relations of similarity among their signata. In the lexicon such correspondences between sound and meaning are exemplified by the so-called phonaesthemes (Samuels 1972). Such diagrammatic relations are typically more or less sporadic in the lexicon, but in a morphological system they may be paramount. Typical examples of diagrammatic patterns are the specialization of certain phonemes or diacritic signs as (parts of) signantia for classes of signata, e.g. consonants for past tense morphemes (-l-, -f-), but vowels for present tense morphemes (-i-, -a-, -o-, -u-) in Russian, the specialization of certain morpheme structures for specific signatum classes, e.g. zero desinences for the unmarked term of diverse grammatical categories or the distinction between longer and shorter desinences as an expression for such quantifier oppositions as plural vs. singular number or imperfective vs. perfective aspect (cf. Greenberg 1963; Jakobson 1957, 1958, 1966).

The importance of diagrammatic relations for the cohesion of syntagms will be touched on in 4.1.2. Here I will mention the need to distinguish symbolic and indexical signatum-signans relations in syntagms. The signans of one sign may be an index of the signatum of another morpheme. Thus Engl. geese means 'goose' and 'plural', but it means 'plural' only by virtue of occurring before (the zero allomorph of) the plural morpheme.

The notions of "cumulative" and "overlapping" exponence (Matthews 1974), which seem motivated at a preliminary stage of morphological analysis, lose their justification as soon as such complexes of symbolized ('goose') and indexed ('plural') signata are properly analysed. Which is not to say that the real problems of analysis disappear which are posed by cases like Engl. -s (fail-s), which likely symbolically represents 'singular' and indexically '3rd person, present, indicative', all represented by zero (as implied above), but allows of several other interpretations, including that of a synthetic signatum (cf. Anttila 1975).

1.1.5 Finally, while the relation between a signatum and its signans in a grammar is an entailment relation of the form "If content 'x', then
expression \( \chi \), it is important to recognize that for the language learner, who has to formulate such deductive rules, the signans is primary and the signatum has to be inferred abductively. Very commonly morphological innovations involve the formulation, as an unwarranted deductive rule, of a signans-signatum relation which is warranted as an inductive inference. In the analysis of morphological innovations, it is therefore essential that both the deductive and the inductive orientations of signatum-signans relations be established.

1.1.6 These informal remarks on some of the elementary notions in a theory of morphology are very far from reflecting the complexity of the conceptual apparatus such a theory must comprise. They are intended only to describe, however superficially, some of the aspects of morphology that have often been overlooked — in synchronic as well as in diachronic studies — but which cannot be disregarded in a systematic study of morphological innovations if valid generalizations are to be hoped for.

It would be desirable to add here some remarks on morphophonemics. It is clear that the traditional way of presenting morphophonemic alternations as an assemblage of mechanical, ad hoc rules is inadequate, and that morphophonemic systems present diagrammatic patterns, of greater or lesser transparency, which must be grasped if innovations in morphophonemics are to be fully understood (Shapiro 1969). In the survey below, however, the focus will be on morphological innovations, and morphophonemic innovations will be discussed mainly en passant in order to emphasize the contrast between these two domains of language structure.

1.2 A second reason for the lack of success of previous attempts at a synthetic view of historical morphology is, as I mentioned above (1.0.1), the lack of an explicit theory of language change. This is not to say that individual kinds of change have not been described explicitly. For instance, quite an adequate account of the process of language transmission as a locus of linguistic innovation can be found as early as in Osthoff's work (1879). Paul gives very detailed accounts of such aspects of change as the creation of analogical neologisms and the gradual acceptance of neologisms by a speech community (1920). Stern, again, achieved a typology of semantic innovations which in its essentials is valid, and in the process he described in detail how several different kinds of change may come about (1931). But these early accounts did not succeed in defining a minimal set of functional and structural factors which determine all possible types of innovations, and hence they could not analyse
individual instances of change consistently or in commensurate terms.

Later investigators, such as Kuryłowicz and Mańczak, have conformed to the pattern, so prevalent in the early phase of structuralism, of viewing language as detached from the real life contexts in which it functions and is transmitted and have thereby restricted themselves to investigations of diachronic correspondences. Since correspondences can arise by many different types of innovation, such an approach can only lead to valid generalizations of a statistical nature, as Mańczak realized from the outset. The search for laws of morphological and morphophonemic change, in the sense given this notion by Kuryłowicz, is an important task for the future. But it stands to reason that it must be based on an analysis of innovations, adequately described in comparable terms, and not on correspondences which are results of sequences of innovations.

1.2.1 In the following survey I will presuppose as reasonably realistic the theory of change put forward in Andersen 1973. This theory distinguishes two modes of innovation, abductive and deductive. Abductive innovations are innovations that arise in the process of (abductively) inferring elements of a grammar from speech. Abductive innovations result in correspondences between elements of a grammar (G-2) and homologous elements of the grammar (G-1) from whose output G-2 was inferred. Deductive innovations are innovations that arise in the (deductive) process of deriving a phonetic output from a semantic representation (which in turn can be viewed as the output of a pragmatic competence) by means of a grammar. Deductive innovations are observable as correspondences between the output (O-2) of one grammar (G-2) and the output from which G-2 was inferred.

1.2.2 Further, two categories of innovations are distinguished, termed adaptive and evolutive. Adaptive innovations arise as purposeful modifications of a grammar, aimed at making it better suited to serve one or another of the functions of language in communication. In explanations of adaptive innovations, the grammar is seen as a constituent part of a communicative system, and reference to the other constituents of this system, the speech situation, is necessary; in deductive innovations, to the speaker himself, the addressee, the referential content, the character of the message, or the channel of communication; in abductive innovations, to the interlocutor's grammar and its output (cf. Jakobson 1964).

Evolutive innovations lack any such specific motivation. Abductive evolutive innovations are explained by the surface forms and referential content from which the innovative elements of the grammar are inferred
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and by the strategies used in the abductive process. Deductive evolutive innovations are typically explained wholly by the underlying representations and the rules operating on them in the grammar that produces the innovations. Only to a limited extent do other factors enter the picture (cf. 4.1).

1.2.3 Finally, the theory includes an account of the functions of different types of innovations, formulated in such general terms that it is uniformly applicable to innovations in all parts of linguistic structure (Andersen 1973). Since questions of causality are not of principal concern in the survey below, an application of this part of the theory to the data of historical morphology and morphophonemics must be deferred to a later occasion.

1.2.4 With the help of the two dichotomies abductive/deductive and adaptive/evolutive, all instances of change can be analysed as sequential complexes of innovations. For instance, a neologism may arise as an individual adaptive (deductive) innovation serving a specific purpose in communication. But only through numerous (abductive) contact innovations can it gain the acceptance of a speech community, and only through subsequent collective (deductive) innovations does it gain currency. In a language contact situation, the primary grammar may interfere with the secondary grammar both when this is (abductively) acquired and when it is (deductively) used to produce utterances in the secondary language. The secondary grammar may interfere with the primary grammar in the (deductive) production of utterances in the secondary language. But it is only when this novel output serves as basis for collective (abductive) contact innovations or for (abductive) first language acquisition within the speech community that the result of the interference comes to be more than individual deviations from the received norms of one or the other language and acquires the status of a social fact.

In the survey below, I will generally abstract from the various mechanisms of change involved in the codification of different types of innovations and will concentrate on the initial innovations. This is an unavoidable simplification, which is made with the understanding that in the proper place, each of the examples adduced below would be expanded into a full scale account of the sequence of differently motivated innovations by which it was followed.

2.0 Adaptive innovations: The deductive innovations which arise in response to a perceived inadequacy of a grammar to carry the semantic content the speakers wish it to express can be categorized according
to the communicative function they are intended to serve — the emotive, the conative, the referential, the poetic (or aesthetic), and the phatic (cf. Jakobson 1964). More important from the point of view chosen here, innovations can be made at different levels of the grammar.

2.1 Accommodative innovations in inflectional morphology consist in the novel selection or combination of features of grammatical meaning to correspond to freshly perceived communicative needs. They parallel the types of lexical innovation Stern termed substitution and nomination.

Innovations in selection are the origin of grammatical transposition (or grammatical metaphor). The Russian use of the plural to express great extent, quantity or degree may be emotive in origin (e.g. morózi ‘severe cold’, lit.: ‘frosts’); the ironic, archaizing tel,esá, lit.: ‘bodies’ or ‘corpora’, used about a fat person’s body, being jocular, serves an aesthetic function. The widespread replacement of the imperative with other moods, substitutions aimed at obtaining the cooperation of the addressee, evidently serves the conative function. The eventual replacement of the inherited imperative by the optative in prehistoric Slavic undoubtedly had its origin in such a transposition (cf. Kuryłowicz 1964:136).

While innovations in selection are observable only as modifications in the referential value of existing morphological means, innovations in the combination of features of grammatical meaning directly affect inflectional paradigms. As an example, consider the Russian affixation of the ‘2nd person, plural’ desinence -t,e to the ‘1st person, plural’ forms used for the inclusive imperative of perfective verbs to signal plural addressee or politeness (e.g. po-govor,-i-m ‘let us talk’, po-govor,-i-m-t,e ‘let us talk’), and not only to these verb forms, but also to indeclinables with conative function, e.g. na, na-t,e ‘there you are’, nu, nu-t,e ‘well’, polno, polno-t,e ‘enough!’ (Obnorskij 1953:147).

Another example is the extension of the narrative paradigm in the history of Bulgarian (see example (1)). Originally developed as a counterpart of the aorist (paradigm A) — I will return to this below (3.1) — the narrative was needed also in conjunction with other tenses. A new

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<td>Impf.</td>
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<td>Plup.</td>
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Compound preterite was formed to carry the meaning of 'narrative' plus 'retrospective', corresponding to the "vouched for" perfect and pluperfect, and another, based on a new /-participle formed from the imperfect tense stem, was created to correspond to the "vouched for" present and imperfect (paradigm B; the verb 'to write') (Mirčev 1963:208f., Gołąb 1959).

Innovations such as this, motivated by the referential function, seem relatively rare in inflectional morphology — they are also difficult to distinguish from the deductive evolutive innovations discussed in 3.5. Accommodative innovations are more frequently motivated by the aesthetic function, as deliberately jocular, or at least attention-focusing, formations. As a striking example one can note the use of participial suffixes with hyperbolic value in adjectives in Russian, e.g. (with the present active participle suffix) bol's-ušč-ij 'hugeous', tolst-ušč-ij 'fat' zl'-ušč-ij 'wicked' (Obnorskij 1953:195f., Al'muxamedova 1976).

2.2 Remedial innovations are innovations in signantia, innovations that serve to reestablish distinctions between signantia which have become identical (have become homonymous) or have come to have identical realizations (have become homophonous) through sound change.

2.2.1 Homonymy can be eliminated in various ways, e.g. (a) lexico-syntactically by periphrasis, (b) morphologically by syncretism, one (or several) of the homonymous desinences being replaced with another (others) from the same paradigm, or (c) morphophonemically by an innovation in the selection of desinence allomorphs.

To suggest the character of an innovation of type (b), one can take the well known replacement of accusative desinences with genitive desinences with nominal stems denoting animates in the Slavic languages. The innovation is limited to those paradigms in which the accusative is otherwise identical with the nominative and is thus clearly morphological and not syntactical. It seems likely, though, that this innovation should be interpreted in a different way (see 5.1).

As an example of (c), consider the early Russian development by which the genitive plural allomorphs -u, -i in original o-stem masculines — where they had become identical to the nominative singular desinences ū, -i by sound change — were replaced by the allomorphs -ovu, -evo characteristic of original u-stems (cf. Borkovskij — Kuznecov 1965:200).

2.2.2 Homophony, too, can be eliminated in various ways, at least by morphophonemic and phonological innovation.
In large parts of the Russian language area, neutralization rules produce identical realizations of unstressed /o e i/ and after a palatalized consonant: the nom.sg. forms [s,istrá p,itró st,íná pl,íta] have the same underlying stem vowel as the corresponding plurals [s,óstrá p,átna st,éni pl,íti] ‘sister, spot, wall, hearth’. In the second conjugation, the neutralization leads to the homophony of the 3rd sg. and 3rd pl. forms of stem-stressed and mobile-stressed verbs (see (2)). Many dialects (including the old Moscow city dialect; cf. Jakobson 1948) have replaced the 3rd pl. desinence of these verbs with the corresponding desinence of the first conjugation (see (2), dialect A), thus maintaining the morphological distinction between 3rd sg. and 3rd pl. by merging the two (morphophonemic) conjugation classes after accented stems.

(2) First and second conjugation end-stressed and mobile-stressed verbs in Russian dialects

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<th>Mobile-stressed</th>
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<td>Dialect A</td>
<td>I conj.</td>
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<td>II conj.</td>
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<td>3rd sg.</td>
<td>žív,-ó-t</td>
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<tr>
<td>3rd pl.</td>
<td>žív,-ú-t</td>
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Other dialects (see (2), dialect B) (including those on which the current orthoepic norms are based) exempt the 3rd pl. desinence (and a number of other desinences as well) from one of the neutralization rules, thereby maintaining the morphological distinction and keeping the conjugation classes clear-cut at the cost of constraining a phonological rule (Obnorskij 1953:147f.; Avanesov — Orlova 1965:150; Halle 1959:50, 70; Shapiro 1968:18f.).

The morphophonemic and the phonological innovation described here are a clear instance of a bifurcation, two logically alternative innovations which, as far as one can judge, are equally possible. It shows that bifurcations are not limited to abductive innovations (illustrated in Andersen 1975), but can also arise in the deductive modification of a grammatical system where the typological properties of the language leave a choice between several options.

3.0 Contact innovations arise when speakers adjust their speech to the usage of others. As suggested in 1.2.4, it is through contact innovations that members of a speech community continually adapt their usage to what they perceive to be the current norms of their speech community. Second language learning, too, is a kind of contact innovation, only of
a different order of magnitude. Contact innovations can only consist in an elaboration of a grammar, but their ultimate consequences as contact changes may be describable either as simplifications or as elaborations. In inflectional morphology, contact innovations may affect the system of signata and/or the system of signantia or the morphophonemic system.

3.1 It is not difficult to give examples of morphological calques, i.e. instances in which a grammatical category appears to have been borrowed and given expression with native morphological means. In prehistoric Baltic, for instance, the local cases (illative, allative, and adessive) of a contiguous Finnic language were adopted, expressed with combinations of a native grammatical case plus a postposition, and made subject to agreement just like the inherited cases (cf. Senn 1966:92f.; Stang 1966:228f.). Middle Bulgarian and Macedonian apparently adopted from Turkish the category of narrative, employing inherited perfect forms in the novel function of aorist plus narrative, and making use of the formerly stylistic difference between presence and absence of the auxiliary in the third person to express the opposition non-narrative perfect vs. narrative aorist (cf. 2.1).

It seems likely, though, that such innovations are best understood not as parallels to lexical calques, that is, as purposeful modifications of the speakers’ primary grammars, but as results of interference in the deductive production of utterances by speakers with a composite linguistic competence. I will return to them in 3.5.

3.2 Morphological borrowing proper is probably most common where the secondary grammar is closely related to the primary one. The acquisition of the Standard German opposition simple preterite vs. perfect by speakers of southern varieties of German, or of the Standard Danish three-gender system by speakers of genderless Jutish dialects, or of the case system of Standard Serbocroatian by speakers of southern varieties of Serbian are examples involving a restructuring of the system of signata as well as the adoption of new signantia. To take another example, Russian, which early abandoned the use of participles — reinterpreting nominatives of participles as verbal adverbs and retaining only a small number of inflected participial forms lexicalized as adjectives — has adopted participial constructions with the value of reduced relative clauses from Russian Church Slavonic, borrowing the appropriate participial suffixes from this language (Bulaxovskij 1958:234f.).

The converse type of innovation can be exemplified from those Russian dialects in which two preterites are distinguished, a simple (e.g., on
u-jéxa-l ‘he left’) and a retrospective (e.g. on u-jéxa-vši ‘he has/had left’) (Obnorskij 1953:153f.; Veyrenc 1962:97f.). Adapting their speech to the norms of the standard language, speakers having this distinction suppress it, using the forms of the simple preterite, which is overMy similar to the single past tense of Standard Russian, for both their native preter-ites. See also Kuz’mina–Nemčenko 1971:116f.

3.3 The replacement of native inflectional signantia with borrowed ones is a commonplace phenomenon where dialect speakers acquire and use the desinences of a prestige dialect such as a standard language. A simple example is the replacement in various Russian dialects of different shapes of the adjectival desinence for ‘gen.sg., masc.-neut.’ (-ogo, -oyo, -oo) by the standard desinence -ovo (Avanesov–Orlova 1965:120).

3.4 As an example of a contact innovation in morphophonemics one can take the reintroduction of consonant alternations in 2nd conjugation verbs in Russian dialects which have long since abandoned alternations preserved in the standard language. By this innovation, the alternations listed under (A) in (3) are introduced in the paradigms of verbs with stems in -i or -e (infinitives listed under (B) ), so that 1st person sg. present tense forms (C) become identical with those of the standard language (D). Actually the dialects in question have these alternations in the inflection of other verb types and accompanying derivational suffixation. Still the alternations are extended to verbs in -i and -e gradually, usually first to stems in -d, and last to stems with a final labial, as indicated by the numbers under (E). Other dialects show a different progression, reintroducing the alternations first in verbs with end stress in the 1st person sg. and only later in verbs with stem stress (Bromlej–Bulatova 1972:225f.).

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<td>t, ~č</td>
<td>krut,i-t</td>
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<td>s, ~§</td>
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<td>z, ~ż</td>
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<td>voz,-ū</td>
<td>vož-ū</td>
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<td>p, ~pl</td>
<td>top,i-t</td>
<td>top,-ū</td>
<td>topl,-ū</td>
<td>3</td>
</tr>
<tr>
<td>b, ~bl</td>
<td>lub,i-t</td>
<td>lub,-ū</td>
<td>lubl,-ū</td>
<td>3</td>
</tr>
<tr>
<td>m, ~ml</td>
<td>tom,i-t</td>
<td>tom,-ū</td>
<td>toml,-ū</td>
<td>3</td>
</tr>
<tr>
<td>v, ~vl</td>
<td>lov,i-t</td>
<td>lov,-ū</td>
<td>lov,l,-ū</td>
<td>3</td>
</tr>
</tbody>
</table>

3.5 Just as the preceding examples, the last one is motivated by the greater prestige of the imitated usage. There are, however, innovations in
contact situations for which it seems hazardous to posit such a motivation, and which are more naturally accounted for simply by reference to the greater simplicity of the grammar whose usage is generalized. Consider the Polish dobětk//dobytek isogloss, which since it arose some 900 years ago has been slowly shifting northward. The dobětk dialects north of the isogloss break up stem final consonant clusters before zero desinences according to the following general rule (which has lexical exceptions): if the stem final segment is a voiced obstruent or a sonorant, and the preceding segment is not a vowel, an e or ě is inserted before the last segment; if the last segment is a voiceless obstruent, and it is preceded by two non-vowels, an e or ě is inserted before the penultimate segment. The dobytek dialects south of the isogloss insert an e before any stem final consonant if it is preceded by a consonant (again with lexically marked exceptions). Each of these vowel insertion patterns has been productive and perfectly stable — except along the isogloss, where the dobětk pattern has proved recessive and the dobytek pattern dominant. It seems evident that in interdialectal communication, it must have been easier for dobětk speakers to adapt their speech to that of their dobytek interlocutors than vice versa. But it must also be recognized that wherever the two patterns have coexisted in a speech community, learners have more easily learnt to produce acceptable forms with the dobytek rule and may hence have tended to acquire only this simpler rule (Andersen 1970).

Besides contact innovations, then, it seems necessary to recognize two categories of interference innovations which are not motivated by specific communicative functions: the deductive ones discussed in 3.1, which arise in the speech of speakers with a composite grammar, and abductive ones originating when grammars are inferred from speech data reflecting heterogeneous norms of usage. In the survey of evolutive innovations below I will bypass these types of complex innovations and limit myself to the types of innovations that can be explained on the basis of a single grammar or speech data reflecting unified norms of usage.

4.0 Evolutive innovations: These are, as mentioned in 1.2.2, the innovations that arise when a linguistic system is transmitted within a speech community, and which are explained entirely by relations within the grammar and the general strategies speakers use when they infer a grammar from the speech of their models and when they use their grammatical competence to produce speech themselves. The typical evolutive change in morphology or morphophonemics involves both abductive and deductive innovations. In the model of change applied here, abductive innovations are assigned principal importance, for it is in
these, covert innovations that new relations among signata and signantia or among variants of signantia are formulated. Deductive innovations, on the other hand, typically merely bring out into the open, as observable innovations in usage, the consequences of previous abductions.

In analysing an evolutive change such as the redistribution of desinences between Old Russian and Modern Russian described in (4), we can therefore concentrate on positing the abductive innovation, made by generations of speakers, without which the present distribution of the desinences -\(u\) and -\(e\) would not have come about: the two allomorphs of the Old Russian locative desinence were interpreted as distinct morphemes embodying the case opposition non-ascriptive vs. ascriptive (cf. Jakobson 1958/1971:173f.).

(4) (a) In Old Russian, two or three dozen masculine 1st declension nouns (original \(u\)-stems) have the locative singular desinence -\(u\). All other masculine 1st declension nouns (original \(o\)-stems) have the locative singular desinence -\(e\).

(b) In Modern Russian, over 100 masculine 1st declension nouns distinguish two locatives in the singular, one in -\(u\), governed by the prepositions \(\nu\) ‘in’ and \(na\) ‘on’ denoting concrete location in space or time, the other in -\(e\), governed by \(\nu\) and \(na\) in other senses and by other prepositions.

We can simplify our account in one more respect. Just as “el cambio fónico no termina, sino que empieza con la ‘ley fonética’” (Coseriu 1958:57), so we may assume — where there is no evidence to the contrary — that from the very beginning of a morphological or morphophonemic development such as the one illustrated by the correspondence in (4), significant numbers of speakers in inferring their grammars formulate as a primary generalization about the observed speech data what eventually appears as the outcome of the development (cf. Andersen 1969:825f., 1973:587). At any point during the development, speakers have to supplement this primary generalization with adaptive rules and lexical exception features in order to conform to contemporary norms. But the primary generalization limits their ability to do this effectively, predisposes them to accept only some deviations from the norms in the speech of others as being in accordance with the system of the language, and in this way contributes to steering the development towards its conclusion. An observable morphological or morphophonemic development, then, can be seen as a process of making the norms of usage fit the relations and rules that constitute the core of the grammar, its functional system.
(Coseriu 1962:106f.). On the basis of this view of evolutive change, it is legitimate in the kind of survey to be given below not only to limit the account of the individual example to the crucial abductive innovation, but also to restrict it to the primary generalization.

4.1 The merely accessory role assigned to the deductive innovations in most types of evolutive change agrees well with the axiom that "nihil est in sermone, quod non prius fuit in grammatica". There are, however, several types of innovation in morphology which can only be understood as originating in the production of speech, and which for their explanation require reference to the grammar and to strategies of speech production.

In section 3.5 I mentioned interference innovations in the speech of speakers with composite grammars as an example of deductive evolutive innovations. The types to be considered here are similar inasmuch as they can be viewed as interference phenomena, albeit intragrammatical.

4.1.1. Paradigmatic assimilation: Lexical blends are a well known example of assimilation between members of a lexical paradigm. Ger. Gemäldnis, a portmanteau formation of Bildnis and its hyponym Gemälde, Engl. irregardless, based on the synonyms irrespective and regardless, are familiar examples involving whole morphemes. Signans parts smaller than morphemes are involved in the creation of such standard examples as Late Latin sinexter from sinister and its antonym dexter or of early dialectal Romance grevis from gravis and its antonym levis (cf. Hermann 1931:78f.). In the case of synonyms, the identity of meaning may be reflected in a single new signans. Antonyms remain distinct, but the near identity of their signata is diagrammed by the greatest possible similarity of their signantia.

Purely deductive innovations like these are difficult to instantiate in inflectional morphology. Superficially, the desinence of Russ. dv-um,ā 'two; instr.', tr,-om,ā 'three; instr.', četir,-m,ā 'four; instr.' might look like blends of the earlier, well attested desinences of dv-umá, tr,-em,ī, četir,-m,ī. But in this and other similar cases it seems more appropriate to analyse the desences into their constituent elements and interpret the changes as results of abductive innovations (see 5.3.3 and 5.5.2 for parallels).

4.1.2. Syntagmatic assimilation: The well-established characteristic mutual rapprochement of the members of irreversible binomials (such as in (5)) arises typically as a result of semantic solidarity plus syntactic vicinity (Malkiel 1968:319).

(5) Old Fr. au feur et mesure; 17th c. au fur et mesure; Mod. Fr. au fur et à mesure.
Where the semantic solidarity is based on a similarity relation and the constituents of the binomial are at the same time members of one paradigm — as in *grevis aut levis* (cf. Hermann 1931:79) — one may speak of paradigmatic assimilation. But semantic solidarity may be based on other relations and may bind together members of different paradigms. A morphological assimilation in such cases may be termed syntagmatic.

As an example, consider the change of conjugation in the aorist of the verb ‘to see’ in areas of Western Bulgaria, Macedonia, and Southern Serbia ((6), dialects A, B, C) (Alexander 1976:344f., 471f.).

(6)  

<table>
<thead>
<tr>
<th></th>
<th>Dialect A</th>
<th>Dialect B</th>
<th>Dialect C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aor. lsg</td>
<td>vide-x</td>
<td>vid-ox</td>
<td>vid-ox</td>
</tr>
<tr>
<td>2-3sg.</td>
<td>vide-Ø</td>
<td>vid-e</td>
<td>vid-e</td>
</tr>
<tr>
<td>1pl.</td>
<td>vide-xme</td>
<td>vid-oxme</td>
<td>vid-oxme</td>
</tr>
<tr>
<td>2pl.</td>
<td>vide-xte</td>
<td>vid-oxte</td>
<td>vid-oxte</td>
</tr>
<tr>
<td>3pl.</td>
<td>vide-xa</td>
<td>vid-oxa</td>
<td>vid-oxa</td>
</tr>
</tbody>
</table>

The change, by which the verb ‘to see’ becomes exceptional among *e*-stem verbs by forming its aorist like verbs ending in an obstruent, is enigmatic and appears unmotivated in dialects of the B type. But in some smaller areas, the conjugation of ‘to see’ has changed not only in the aorist, but also in the participle used to make periphrastic forms ((7), dialect C).

(7)  

<table>
<thead>
<tr>
<th></th>
<th>Dialect A</th>
<th>Dialect B</th>
<th>Dialect C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pcpl. masc.</td>
<td>vide-l-Ø</td>
<td>vide-l-Ø</td>
<td>višel-Ø</td>
</tr>
<tr>
<td>fem.</td>
<td>vide-l-a</td>
<td>vide-l-a</td>
<td>višl-a</td>
</tr>
</tbody>
</table>

This is a startling innovation, for by it the verb ‘to see’ comes to have a suppletive paradigm. It is a paradigm that is otherwise unique to the verb ‘to go’, *id-* , and its prefixal derivatives (e.g. *ot-id-* ‘leave’, *prid-* ‘to come’) (see (8)). A semantic solidarity between these verbs exists only in syntagms such as *idoxme i vidoxme* ‘we went and saw’, *prišel e i višel* ‘he has come and seen’, which are likely the source of the innovations in dialects of both the B and the C type.

(8)  

<table>
<thead>
<tr>
<th></th>
<th>Dialects A, B, C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aor. lsg</td>
<td>id-ox</td>
</tr>
<tr>
<td>2-3sg.</td>
<td>id-e</td>
</tr>
<tr>
<td>1pl.</td>
<td>id-oxme</td>
</tr>
<tr>
<td>2pl.</td>
<td>id-oxte</td>
</tr>
<tr>
<td>3pl.</td>
<td>id-oxa</td>
</tr>
</tbody>
</table>
Semantic solidarity and syntactic vicinity are characteristic also of hypotactic and appositive syntagms. The widespread, though irregular, iteration of prepositions in such syntagms in Old Russian illustrates the strong tendency to supplement the contiguity relations in syntagms with similarity relations (9). It is this tendency — which can only be understood as a production strategy — which must be universally responsible for the development of grammatical concord.

(9) Se jaz, knjaz' velikij Semen Ivanovič vseja Rusi, s svojeju bros'ju molodšejso knjazem s Ivanom i s knjazem Andreem. . . .


5.0 Abductive evolutive innovations: These are the chief source of change in the internal history of a language, arising as they do in the process of grammar formation, in which every speaker of the language grasps its over-all design and formulates extensive, detailed systems of rules to account for both the norms of usage he himself acquires actively and for others which may be current in his speech community. The way in which the language learner accomplishes this task can be studied systematically through an analysis of abductive innovations, for each kind of strategy used, each level of analysis, holds its peculiar possibilities of innovation where the data the language learner has to analyse do not univocally point to a single resolution. In Andersen 1975 I showed that the most fertile method one can use in the investigation of the abductive process is the comparison of pairs of alternative innovations, bifurcations, and argued that a definitive typology of abductive innovations must enumerate all the possible kinds of decisions the learner must make in abducting a linguistic structure. The extreme complexity of inflectional morphology — and the data I have at my disposal — make it impossible to apply this method consistently here. But enough examples of alternative innovations will be given below, I hope, to suggest that this research programme is reasonable.

5.0.1 In a language learner’s analysis, several kinds of decisions can be discerned. One of these results in a segmentation of the surface forms into signantia. The term ‘segmentation’ is somewhat awkward when one
Morphological change: towards a typology

considers that some signantia are not composed of whole segments, but of single diacritic signs or combinations of diacritic signs smaller than phonemes. The term seems quite inappropriate once one accepts that some morphological signs have relative signantia (cf. 1.1.2). But the term is traditional and may stay.

By another kind of decisions, the valuation of signantia, the phonological composition of signantia is determined.

In yet another decision process, signantia with similar reference are matched. It is in this operation that alternations may be identified. This may be termed the valuation of signata, for it consists in assigning symbolic signata to individual signantia and, when an alternation has been identified, in assigning different relative value to the alternants, some alternant(s) (or class(es) of alternants) being valuated as marked — and characterized by some positively defined privileges of occurrence — and one alternant (or class of alternants) being valuated as unmarked — occurring “elsewhere”. The privileges of occurrence of a signans are tantamount to its indexical signatum (cf. 1.1.4).

Both kinds of operation, segmentation and valuation, are to a more or less evident extent governed by higher order hypotheses about the design of the language, about — among other things — how the system of morphological categories is structured and individual categories ranked, and what morphological techniques and processes of synthesis ( Sapir 1921:120f.) are to be given preference (cf. Coseriu 1968:99f.), and about real and virtual diagrammatic relations between the system of morphological categories and the corresponding systems of signantia (Jakobson 1965).

This whole complex of operations comprises thousands of decisions, each of which in principle involves a potential innovation. To resolve it into an ordered series of discrete steps, each with its decision procedure, is impossible. It is clear, for example, that the valuation of a string of signata both precedes the segmentation — it is the complex nature of the content side that motivates the analysis of the expression side — and in the end results from it. In other words, the processes of valuation and segmentation are concurrent. But one can still define the types of abductive innovation that are possible in morphology and morphophonemics and hope, thereby, to gain some insight into the strategies learners use.

5.0.2 The exposition in the following sections will deal first with innovations in the system of morphological categories (5.1) and then with innovations involving individual morphemes (5.2). Morphophonemic alternations in grammatical morphemes will be discussed in 5.3 and stem
alternations in 5.4. Section 5.5 will be devoted to innovations which are motivated by the morphological or morphophonemic system.

5.1.1 Innovations in morphological categories can arise apparently spontaneously, that is, without any evident motivation in the abductive process.

As an example one can mention the radical reduction of the Old Russian system of finite preterite tenses (imperfect, aorist, and maybe half a dozen periphrastic tenses; cf. van Schooneveld 1959) to a single preterite (the original perfect) which takes place within three or four centuries in almost all East Slavic dialects in the Middle Ages (Borkovskij — Kuznecov 1965:292f.).

A converse development is the rise of the morphological category of animacy in the Slavic languages. In prehistoric Slavic, sound changes make the accusative homonymous with the nominative in several nominal declensions. In other declensions, it has a discrete desinence. Only in one paradigm, the animate interrogative (indefinite) pronoun kuto ‘who’, is the accusative homonymous (or syncretic) with the genitive. By the beginning of the attested period, genitive desinences are used fairly regularly instead of accusative desinences with singular nouns (and adjectives) of the first mentioned declensions when they denote (or modify nouns denoting) free, healthy, adult male persons. In Russian, “genitive” accusatives are regular with singular nouns denoting any male person by the 1300’s, with plural nouns denoting male persons from the 13-1400’s, with plurals denoting female persons from the 14-1500’s; masculine singular nouns denoting animals have genitival accusatives from the 1300’s on, plurals (regardless of gender) from the 1600’s.

These are examples of a kind of morphological innovation which is not adaptive: there is no basis for viewing them as contact innovations, and although the outcome of the latter development — a consistent morphological marking of the subject and object cases of animate nouns — can be said to be desirable, it can hardly be interpreted as a remedial innovation (cf. 2.2.1), that is, as an active, purposeful modification of the system for the sake of avoiding “pernicious homonymy”. The very slow process by which the norms of usage have changed indicates rather that it has been motivated from within. Such an interpretation seems attractive in the case of the reduction of the preterite system, which can be seen as connected with the ascendency of the category of aspect, which comes to dominate the Russian verb in the same period: the system of shifter categories in the verb (the old tenses) is reduced as the role of non-shifter event designators (the aspects and subsaspects) is strengthened. (For the theory of morphological categories used here, see Jakobson 1957.)
One possible way of understanding such instances of long term drift involves the assumption that apart from hypotheses about the actual system of morphological categories of his language, a language learner formulates higher order hypotheses about its typological properties, and that these hypotheses, which may involve a ranking of different generic and specific morphological categories, determine which categories will be exposed to reduction and loss — as here the verbal shifters — and which may be further elaborated (cf. Coseriu 1968:99f.) — here, the generic categories of aspect (event designators) and gender (participant designators). This is a plausible way of accounting for long term drift in phonological systems (cf. Isačenko 1939; Andersen 1978), but before explanations of this kind proposed for innovations in morphological type can be evaluated, we obviously need to know more about the typology of systems of morphological categories (cf. Hjelmslev 1963:92f.).

5.1.2 Other innovations in morphological categories appear to arise out of indeterminacies in the speech data from which the morphological system is inferred. One can distinguish instances of indeterminacy in the relation between the system of signata and the norms of reference and in the relation between the system of signata and the system of signantia.

5.1.2.1 In prehistoric Slavic, the inherited optative is reinterpreted as an imperative, undoubtedly because it was used to express commands, requests, and advice; it ceased to function as a grammatical transposition (cf. 2.1); cf. Stern's category of “fading” (1931). The consequences of this innovation — from which we can infer it — were that the optative was lost as a morphological category, being renewed by periphrastic means (a remedial innovation, cf. 2.2); the forms of the original imperative fell into disuse and disappeared; and the inflection for person in the original optative was lost: it is still attested in Old Church Slavonic, but in Modern Russian, for instance, only the 2nd person singular survives from which a new 2nd person plural is derived by the addition of the morpheme -t,e 'plural' (mentioned in 2.1), e.g. živ,-i, živ,-i-t,e ‘live!’ (ORuss. živ-i, živ-ě-te).

The example shows how the content of a morphological category can change through an innovation in valuation — made possible by the category's referential value and independent of its expression.

5.1.2.2 When the signantia of distinct morphological categories become homonymous through sound change, a category may be lost. A typical example is the reduction and loss of gender distinctions in English and in Danish dialects, where sound change has obliterated distinctions in
agreement and gendered pronouns have been restricted to express natural gender (with few exceptions in English).

Homonymy of signantia, as in these developments, is not the only kind of indeterminacy in the relation between signata and signantia which may give rise to innovations in a system of morphological categories. There is a logical converse in cases where the existence of allomorphs for a single signatum motivates the innovation of a new morphological distinction. In Old Russian, two declensions which had become partially similar through sound change (the earlier o-stem and u-stem declensions) could not be kept distinct and were amalgamated. The resulting two variants of the locative desinence, -e and -u, which originally occurred each with its set of lexemes, were differentiated grammatically, -ū (locative II) being specialized for concrete location (governed by v ‘in’ and na ‘on’), -e (locative I) being used with these prepositions in other senses and with other prepositions governing the locative. The distinction is now made with well over a hundred substantives of the first declension (plus their diminutives). At the same time, stress levelling in third declension nouns had created locatives with alternative stress. These were harnessed to the same distinction, so that now some 20 third declension nouns have a locative I in -i and a locative II in -i (Bulaxovskij 1958:135f.; Kiparsky 1967:34f.).

There is a difference worth noting between this innovation and the previous one in that the development of the two locatives and the similar development of a morphological distinction between two genitives, genitive II (with the original u-stem desinence -u) for purely quantitative determination and genitive I (with the original o-stem desinence -a) for the other functions of the genitive — do not involve the rise of new morphological categories, but only the creation of new combinations of existing features of case meaning (cf. Jakobson 1958/1971:173f.); whereas in the development of English and the Danish dialects mentioned, genders are lost as morphological categories. Viewed as diachronic correspondences, therefore, these changes are quite different. But as innovations they are comparable: both types of innovation arise due to an indeterminacy in the relation between signantia and morphological signata, and the two kinds of indeterminacy involved are truly converse.

5.1.3 It is far from certain that a strict distinction should be made between the apparently spontaneous innovations (5.1.1) and the innovations that appear to be motivated by indeterminacies in speech data (5.1.2). It is hardly possible to maintain that morphological distinctions arise just because there are signantia available to carry them, or that morphological distinctions should disappear just because sound changes
whittle away at certain desinences. It seems reasonable to assume that the apparently motivated innovations are in part determined by the typological properties of the language in question and that the apparently spontaneous innovations are in fact set off by kinds of indeterminacy which are merely difficult to establish.

5.2 Morphological innovations in the narrow sense comprise innovations in the valuation of individual morphological signs, innovations in the segmentation of signantia, and innovations in segmentation involving a new valuation of signata. Finally we will consider morphic innovations.

5.2.1 Innovations in valuation can be motivated by indeterminacies in the referential value of a signatum or in the relation between signantia and signata. Indeterminacies of the latter kind can be of a morphological or of a phonological kind.

As an example of a morphologically conditioned indeterminacy (homonymy) giving rise to an innovation in valuation, one can mention the re-interpretation of the Old Russian feminine singular collective nouns such as *gospoda* 'lords, gentlemen', *bratija* 'brothers' as plurals. The singular collectives required a plural predicate but singular modifiers, and were in their declension quite distinct from plurals. The loss of the dual, however, gave rise to a new nominative plural ending in -á (e.g. *boká* 'sides', *b,er,egá* 'river banks', *rogá* 'horns') and made the nominative singular of these collectives ambiguous. They were reinterpreted and combined with plural modifiers and, subsequently, with regular plural desinences in the oblique cases (cf. Borkovskij — Kuznecov 1965:212f.).

A similar innovation, but conditioned by a phonological ambiguity (homophony), affected Russian stem-stressed neuter collectives, whose nominative singular desinence, as a consequence of vowel reduction, became indistinguishable from the nominative plural of non-collectives: *kam,én,jo* 'stones', *kolós,jo* 'ears (of grain)', *zúb,jo* 'teeth', *súčjo* 'branches' were reinterpreted as *kam,én,ja*, *kolós,ja*, *zúb,ja*, *súčja* (to mention only a few examples). As in the preceding example, the consequences of this abductive innovation were first syntactic — as plurals they require plural modifiers (e.g. 17th c. Russ. *gruda bol' six kamen'ja* 'a heap of large (gen.pl. desinence) rocks (gen.sg. desinence)') — and then morphological: in the oblique cases their singular desinences were replaced with plural desinences (cf. Borkovskij — Kuznecov 1965:213f.).

In a number of nouns, the individualizing and collective plurals are semantically distinct: *zúb* 'tooth' has the plurals *zúbi* 'teeth' and *zúb,ja* 'cogs', *l,ist* 'leaf' distinguishes *l,isti* 'leaves, sheets' and *l,íst,ja* 'foliage'. But
in several nouns, the collective has simply replaced the original plural, e.g. *brát,ja, kolós,ja, mužjá* ‘husbands’, *kn,az,já* ‘princes’. This is the result of an innovation in valuation motivated by referential ambiguity, the first subtype mentioned at the beginning of this section.

5.2.2 Innovations in the segmentation of signantia are typically motivated by ambiguities in the signantia.

A simple example is the metanalysis of the past passive participle of the Russian verb *dat*, ‘to give’, *dád,onnij*. It was irregular by being formed (in synchronic terms) from the present tense stem alternant (i.e. *dad,-onn-ij*) or — if interpreted as formed from the past tense stem — by having a unique participial suffix (*da-d,onn-ij*). Most Russian dialects have evidently preferred the latter segmentation and form a regular past passive participle from this stem, *dá-nn-ij*, having eliminated the unique suffix alternant. But some dialects have retained the anomalous suffix and have extended its occurrence to the antonyms of ‘to give’: *brád,onnij* ‘taken (imperfective)’, *vz,ád,onnij* ‘taken (perfective)’ (Avanesov — Orlova 1965:170); cf. (10).

(10)

<table>
<thead>
<tr>
<th>Inf.</th>
<th>Middle Russian</th>
<th>Standard Russian</th>
<th>Russian dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>dá-t,</td>
<td>brá-t,</td>
<td>dá-t, brá-t,</td>
</tr>
<tr>
<td>Past</td>
<td>dá-l</td>
<td>brá-l</td>
<td>dá-l brá-l</td>
</tr>
<tr>
<td>Pres. 3pl.</td>
<td>dad-út</td>
<td>b,or-út</td>
<td>dad-út b,or-út</td>
</tr>
<tr>
<td>P. p.</td>
<td>dá-,onnij</td>
<td>brá-nnij</td>
<td>dá-nnij brá-nnij</td>
</tr>
<tr>
<td></td>
<td>däd,-onnij</td>
<td>brá-d,onnij</td>
<td>däd,onnij brá-d,onnij</td>
</tr>
</tbody>
</table>

A particularly frequent type of innovation in segmentation involves zero signantia.

In Middle English, the plural of *child, child-er* (i.e. ‘child’ plus ‘plural’) was reinterpreted as an allomorph of *child* plus a zero plural marker, *childer-0*. The deductive consequence of this innovation was that the zero allomorph for ‘plural’ could be replaced by the more productive *-en*, hence Modern Engl. *children*.

The example is well worth noting, for it shows that the qualms of some descriptivists (e.g. Haas 1954, Matthews 1974) against positing zero allomorphs find no justification in the history of languages. Of course Middle English *childer* never ceased to mean both ‘child’ and ‘plural’. But there is no reason why it would need a new plural desinence if a resegmentation had not occurred. Such a resegmentation was motivated, one may assume, by a reduction of the plural value of *childer* from symbolic to
indexical, which, as well, motivated the addition of an explicit, i.e. real, symbolic plural sign (cf. 1.4).

5.2.3 Innovations in the segmentation of signata: In the examples discussed in 5.2.2, the number of signantia and the symbolic signata assigned to them remained constant through the innovation. Innovations in the segmentation of signata, by contrast, involve the creation of new symbolic signs. When they accompany innovations in the segmentation of signantia, they yield either fewer signantia with more complex symbolic signata or more signantia of lesser complexity. We will look at some examples of the latter type.

In the paradigm of the Russian numeral ‘two’, the nominative is difficult to analyse (cf. (11)). Most linguists would probably identify the desinences -a and -e as carriers of both case and gender meaning. The stem of the nominative feminine would then be considered an allomorph conditioned by the -e desinence. Russianists who believe that (paired) consonants are always palatalized before e in Russian — it once was so — would consider the allomorph dv,- automatically conditioned; those who take seriously the fact that plain consonants occur before e in a large number of loan words would at least recognize that (paired) consonants are always palatalized before desinence initial e and would define the stem alternation as a phonologically conditioned morphophonemic alteration.

(11)

<table>
<thead>
<tr>
<th></th>
<th>Standard Russian</th>
<th>Dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nom.</td>
<td>dv-a</td>
<td>dv,-e</td>
</tr>
<tr>
<td>Acc.</td>
<td>=N/G</td>
<td>=N/G</td>
</tr>
<tr>
<td>Gen.</td>
<td>dv-ux</td>
<td>dv-ux</td>
</tr>
<tr>
<td>Loc.</td>
<td>dv-ux</td>
<td>dv-ux</td>
</tr>
<tr>
<td>Dat.</td>
<td>dvum</td>
<td>dv,um</td>
</tr>
<tr>
<td>Instr.</td>
<td>dvum,a</td>
<td>dv,um,a</td>
</tr>
</tbody>
</table>

Judging by the dialectal innovation shown in (11) (which is not limited to Russian dialects, but has taken place also in Belorussian), learners of this language have analysed these forms differently (cf. Avanesov — Orlova 1965:135; Bulatova 1973; Avanesaw 1964:210). They have recognized signata of three kinds in these forms: ‘two’, gender, and case, and have segmented the signantia accordingly, thus the nominative feminine, for instance, dv,--e, the genitive feminine, by implication, dv-0-ux, and so forth. This abductive innovation has had two consequences:
(1) the signans of 'feminine' presented an unmotivated alternation between palatalization in the nominative and lack of it in the oblique cases; in deductive innovations, this alternation has been eliminated, palatalization being generalized; and (2) the nominative desinence presents an unmotivated alternation; one cannot tell whether -a or -e is the marked alternant; nor can one tell whether they are conditioned by the different genders of the stems or by the phonological difference between the stems, that is, their indexical value is ambiguous.

The innovation is interesting as an argument against the sceptics who object to morphological analysis as a method that "sets up a fictitious agglutinating analog" (Lounsbury 1953:13) and prefer to dispense with "the nonsense of zeros" and deal with whole words (Matthews 1974:116f.).

This is not an isolated example, as a return to the collective plurals mentioned in 5.2.1 will show. In Russian, generally speaking, the nominal plural desinences denote 'plural' plus case. In all Russian dialects there are some nouns with a special stem allomorph that occurs only before plural desinences and therefore has the indexical value of 'plural', e.g. sos,éd- 'neighbour', whose plural stem is sos,éd.-. In the original collectives, the plural stem contains a morph -j- with only this indexical signatum. In some Russian dialects, the original collectives have apparently been reinterpreted: the -j- morph has been valued as a symbolic sign for 'plural', and the plural desinences correspondingly reduced to symbolic signs only for case and indexical signs for 'plural'. As a consequence, inherited plurals like stakáni 'glasses', b,er,ázi 'birches', lósad,i 'horses' and many others are being replaced by a productive plural formation, with a real, symbolic sign for 'plural', stakán,ja, b,er,óž,ja, losad,já, etc. (Avanesov — Orlova 1965:114; Bromlej — Bulatova 1972:95f.).

5.2.4 Morphic innovations: While the signata of morphological signs are established by a valuation based on their reference or function, the signantia are defined on the basis of their pronunciation. The identification of the diacritic signs that make up a morph is an operation that may give rise to morphic innovations.

Every dialect survey, every etymological dictionary provides examples of sporadic morphic changes in lexemes. The widespread pronunciation [blaus] for [blauz] blouse, or the New England dialectal [trɔθ] for [trɔf] trough, are such examples, where neither regular sound change nor paradigmatic or syntagmatic assimilation (cf. 4.1) can be appealed to for an explanation, and the only plausible source of the change seems to be an idiolectal deviation from the norm — based on a mishearing — a devia-
Morphological change: towards a typology

Such apparently haphazard morphic innovations occur in inflectional morphology as well. Since these are in principle unmotivated alterations of signantia, one hesitates to cite examples, for what seems unmotivated today may be explained tomorrow. But perhaps such puzzles as the Indoeuropean desinences with *-bh- in some dialects and *-m- in others are in origin of this type. Another likely example is the Lithuanian frequentative preterite formed with the suffix -dav- (e.g. dūodavo ‘used to give’ from dūoti ‘give’), but in some dialects with a suffix -lav- (e.g. dūolavo) (cf. Stang 1942:173).

Apart from these apparently haphazard morphic innovations, two types of motivated ones can be defined, syntagmatic and paradigmatic reduction, to which I will return below (5.5.1.2, 5.5.1.3).

5.3 Innovations in indexical signata: When different morphological signantia have been defined through segmentation (cf. 5.2.2) and identification of their constituent diacritic signs (cf. 5.2.4) and are to be valuated, the logically first decision to be made is whether differences in reference between similar signata reflect (a) a grammatical opposition or (b) contextual variation based on an identity of grammatical content.

In case the former kind of decision is made, the difference is thereby interpreted as a grammatical opposition. This is the way existing grammatical oppositions are preserved from generation to generation. It is also the way in which new oppositions arise, as we saw in the grammatical differentiation of the Russian locative (5.1.2.2). Finally, by decisions of this kind an existing grammatical opposition may be reinterpreted in the morphological system as a whole (5.1.2.1) or in individual morphemes (5.2.1).

On the other hand, if different signantia are judged to have identical grammatical content, they are thereby interpreted as covariants, and further decisions must be made to determine their distribution. The alternation they present may be interpreted as (a) phonological or (b) non-phonological.

Phonological (alias automatic) alternations — the results of neutralization rules — do not concern the morphology as such. But it is possible for alternants that can be described as automatic to be valuated as (parts of) morphological signantia, as was seen in 5.2.3.

If an alternation is judged to be non-phonological, it must be interpreted either as morphophonemic — the covariants (or all but one of them) being assigned indexical signata (see 5.3.1–5.4.3) — or as morphological, i.e. as a relative signans with a symbolic signatum (5.4.4).
5.3.1 An alternant may be valuated as a phonological index pointing to the signans of a contiguous grammatical or lexical morpheme.

When in primitive Slavic IE*Ř merged with part of the reflexes of IE*s, the aorist morpheme had two allomorphs, -x- occurring before a vowel after a stem final i, u, r, or k and -s- occurring elsewhere. -x- was interpreted as the basic alternant (cf. Andersen 1968) and -s- was valuated as an index of a preceding or following non-compact consonant. Consequently Old Church Slavonic preserves -s- in ně-s-ů ‘I carried’ (cf. nes-∅ ‘I carry’), vě-s-ů ‘I led’ (cf. ved-∅), grě-s-ů ‘I rowed’ (cf. greb-∅), nače-s-ů ‘I began’ (cf. načín-∅), e-s-ů ‘I took’ (cf. im-∅), but has -x- not only in bi-x-ů ‘I beat’, by-x-ů ‘I was’, plu-x-ů ‘I sailed’, trl-x-ů ‘I rubbed’ (cf. tlr-∅), but also in zna-x-ů ‘I knew’, vidě-x-ů ‘I saw’, kla-x-ů ‘I pierced’ (cf. kol-∅), the last of which show the extension of -x- which was the deductive consequence of the limited privileges of occurrence accorded -s-.

It is in principle irrelevant whether the alternation is in origin a phonological alternation (as the preceding one) or a morphophonemic alternation. Thus, in Middle Russian, when the several substantival declensions began to merge in the plural, the productive genitive plural desinence for masculines was -ov. A tiny number of masculines had the genitive plural desinence -ej (viz. the original i- stems). While -ov occurred without phonological restrictions, -ej was found only after stems ending in a palatalized or palatal consonant. This made it interpretable as a phonological index, and it has been generalized for masculines ending in a palatalized or palatal consonant at the expense of -ov, which has been restricted to stems ending in a plain (paired) consonant, or c, or j (Borkovskij — Kuznecov 1965:200, 203f.).

5.3.2 An alternant may be valuated as an index of morphological signata.

The Middle Russian change of e > o produced an alternation in the present tense marker of 1st conjugation verbs, apparently preserved in some dialects (cf. (12), paradigm A)

(12)  

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd sg.</td>
<td>-e-</td>
<td>-e-</td>
<td>-e-</td>
<td>-o-</td>
</tr>
<tr>
<td>3rd sg.</td>
<td>-e-</td>
<td>-e-</td>
<td>-o-</td>
<td>-o-</td>
</tr>
<tr>
<td>1st pl.</td>
<td>-o-</td>
<td>-o-</td>
<td>-o-</td>
<td>-o-</td>
</tr>
<tr>
<td>2nd pl.</td>
<td>-e-</td>
<td>-o-</td>
<td>-e-</td>
<td>-o-</td>
</tr>
</tbody>
</table>

The fact that -o- occurred in the first person plural made it possible to interpret -o- as a plural index, a possibility that has been realized in some
dialektas (B). While in these dialects the basic (unmarked) present tense allomorph is -e-, in most Russian dialects it is -o-. Some of these have interpreted -e- as a 2nd person marker (C), but in most dialects the alternation has been eliminated, -o- being generalized, as in the standard language (D) (cf. Avanesov — Orlova 1965:163f.).

The morphological signatum indexed by an allomorph may be (part of) the content of a grammatical morpheme, as in the preceding example, or of a lexical morpheme: in early Czech, when the morphophonemic distinction between the original o-stem and u-stem declensions was abandoned, the dative singular of the new 1st declension had two allomorphs, ov, i — occurring with a small number of masculine stems (the original u-stems) — and -u, occurring with the vast majority of masculines and all neuters. While strictly speaking the stems taking -ov, i had no lexical or grammatical features in common, two of the most frequent of them, sin ‘son’ and věl ‘ox’ were animate. The allomorph -ov, i was interpreted as an index of animacy, which already had obligatory, morphological expression in the accusative of masculine nouns (cf. the example in 5.1.1), and accordingly extended to all animate masculines (with a few lexical and stylistic exceptions) (cf. Vážný 1963:26f.).

5.3.3 An alternant may be valuated as an index of lexical signata.

The Middle Russian first declension, just like the Czech one, had two allomorphs for the dative singular, -ov, i, occurring with a small number of masculines, and -u, occurring with the vast majority of masculines and all neuters. The allomorph -ov, i has been completely superseded by -u, most likely because it was restricted to specific lexical items which defied generalization (cf. Kiparsky 1967:30f.).

The valuation of an allomorph as an index of lexical content may lead, as well, to its extension. For instance, in Middle Ukrainian, as the distinction between dual and plural number was abandoned, the instrumental plural desinence had two sets of allomorphs, the original dual desinences, of the form -(V)nta — preserved in Modern Ukrainian očyma ‘eyes’, ušyma ‘ears’, plėčyma ‘shoulders’, dvoma ‘two’, oboma ‘both’ — and desinences of the form -(V)(m)y, which occurred with all adjectives and pronouns, and all types of substantives. The allomorph -(V)ma was apparently interpreted as an index of ‘lexical quantifier’, for it has been extended to all cardinal numerals (e.g. tr-y, tr-omá ‘three’, pjat, pjat, má ‘five’) and pro-numerals (kil’k-y, kil’k-omá ‘some’, bahá-t-o, bahan, má) and to the totalizing determinative pronoun ves, ‘all’ (us, -imá) (cf. Samijlenko 1964:139f., 172f., 1970:161; Kernyc’kyj 1967:162f.).

5.3.4 The preceding three sections have given examples of innovations
Henning Andersen

giving rise to indexical signata which are absolute (cf. 1.2.3): the -s-allomorph of the aorist morpheme in primitive Slavic pointed to a contiguous non-compact consonant (5.3.1), the -o- allomorph of the present tense morpheme in one group of Russian dialects points to the plural meaning of the following person affix (5.3.2), and the -(V)ma allomorph of the instrumental plural desinence in Ukrainian points to a specific content feature of the preceding stem (5.3.3). But indexical signata may also be relative.

In early East Slavic, the 3rd person desinence had two alternants, -t and -θ, with a distribution between singular and plural and between the two present tense conjugations which so far has defied reconstruction. In modern Russian dialects, several patterns are found, which are being replaced by that of the standard language (see (13), A), but can still be discerned.

| Pattern (C) is a clear example of a relative index: the 3rd person morpheme has two allomorphs with the same symbolic signatum ('3rd person'); but each of them is an index of the singular in one conjugation, but of the plural in the other (cf. Avanesov — Orlova 1965:162). It may be added that this pattern, which undoubtedly is an innovation, is quite germane to the inherited alternation in the present tense morpheme, which also provides a relative index of the plural in the 3rd person: where the tense morpheme’s basic shape is a non-high vowel (the 1st conjugation), an allomorph with a high vowel signals ‘plural’ in the 3rd person; where the basic shape is a high vowel (the 2nd conjugation), an allomorph with a low vowel signals ‘plural’ in the 3rd person (cf. the formulation in Jakobson 1948/1971:123). Number, then, is not expressed symbolically in the 3rd person of the present tense, but in all varieties of Russian merely indexed by allomorphs of the present tense morpheme and, in some dialects, by allomorphs of the 3rd person morpheme as well.

5.4 Innovations in stem alternations: A typology of innovations in inflectional morphology must include some types of innovations in the morphophonemics of stems, for alternations in stems may either directly (come to) carry grammatical meaning (as relative signantia with symbolic signata), or they may point to the signantia or signata of grammatical
morphemes (as relative signantia with indexical signata) (cf. 1.1.2, 1.1.4). On the other hand, there are several types of morphophonemic innovations which are at most of marginal interest to morphology. In the survey to follow, some of these will be mentioned, but interest will be centred around the types that involve grammatical categories.

When different lexemic signantia have been defined through segmentation (cf. 5.2.2) and identification of their diacritic signs (cf. 5.2.4), and are to be valued, the logically first decision to be made is whether differences of reference between them reflect a semantic opposition or contextual variation based on an identity of semantic content. The decision may be illustrated simply with the development of the two lexemes *shade* and *shadow* from the stem allomorphs of Old English *sceadu* (—*sceadw-*) ‘shade, shadow’ on the one hand and of *meadow* from OE *mǣd* (—*mǣdw-*) ‘meadow’.

5.4.1 Innovations in the locus of an alternation. When an alternation between two (or more) stems has been identified, a decision must be made whether it is a singular alternation or a general alternation. Singular alternations include cases of (total or partial) suppletion — e.g. Engl. *die*, pl. *dice*; *man*, pl. *men*. General alternations are amenable to generalization — the alternations of tense and lax obstruents in Engl. *knife*, pl. *knives*; *bath*, pl. *baths*; *house*, pl. *houses*. It does not seem possible at present to establish a principled line of demarcation between these two alternatives.

When an alternation is judged to be general, it must be decided whether it is a property of individual lexemes or characteristic of a class of lexemes — and in the latter case, the class must be defined by (some combination of) content features (semantic or grammatical) and/or signans features (morphophonemic or phonological). As an example one can take the alternation of plain with palatalized consonants before the nominative plural desinence -i in 1st declension nouns in Middle Russian and Middle Polish. In Russian this alternation was apparently treated as a property of individual lexemes: it was early restricted to animates and then gradually curtailed; now only two nouns have it, *côrt*, pl. *cért*-i ‘devil’ and *sos,éd*, pl. *sos,éd*-i ‘neighbour’. In Polish, this alternation was interpreted as a property of masculines denoting male persons (i.e. its locus was defined by a combination of grammatical and semantic features); the alternation was not only maintained in first declension nouns (e.g. *sôşad*, pl. *sôşêj*-i ‘neighbour’), but in compliance with this interpretation extended to second declension nouns (e.g. *sług-a*, pl. *słu3-y* ‘servant’, *poet-a*, pl. *poeć-i* ‘poet’) (cf. Borkovskij — Kuznecov 1965:215f.; Kiparsky 1967:42f.; Klemensiewicz et al. 1965:308).
5.4.2 Innovations in the alternating elements: When an alternation has been interpreted as general, a decision must be made as to the direction of the alternation, i.e. which alternant(s) is/are basic and which, derived (see further 5.4.3).

The class of phonological elements (diacritic signs, segments) subject to alternation must be defined. If an innovation is made, the class of basic alternants will be expanded or restricted. An example of expansion: in Latvian, the alternation of dentals with palatals ($t \sim s$, $d \sim z$, $s \sim z$, $s \sim \xi$, $\xi \sim z$) has been expanded to include the dental affricates, reflexes of the velar palatalization, $c \sim \check{c}$, $\eta \sim \check{\eta}$, in certain loci (cf. Endzelins 1971:59). An example of restriction: in Russian, in certain loci where $s$ alternates with $\check{s}$, the cluster $sl$, formerly alternated with $sl$; but Modern Russian has $misl$-$u$ 'I think' corresponding to Middle Russian $mis\bar{l}$-$u$ (infinitive $mis\bar{l}$-$i$-$t$).

The class of derived alternants that occurs in a given locus must be defined. If an innovative definition is made, the class of derived alternants may be differentiated (a reductive alternation becoming less reductive) or reduced (an alternation becoming (more) reductive), or it may be replaced — partly or completely — by another class of alternants. An example of differentiation: in Early Ukrainian, stem-final dentals alternated with palatals in second conjugation verbs before the 1st person singular desinence (as in (14) (A)).

(14) A B

<table>
<thead>
<tr>
<th>basic</th>
<th>$t$</th>
<th>$d$</th>
<th>$s$</th>
<th>$\xi$</th>
<th>$t$</th>
<th>$d$</th>
<th>$s$</th>
<th>$\xi$</th>
</tr>
</thead>
<tbody>
<tr>
<td>derived</td>
<td>$\check{c}$</td>
<td>$\check{\xi}$</td>
<td>$\check{s}$</td>
<td>$\check{\xi}$</td>
<td>$\check{c}$</td>
<td>$\check{\xi}$</td>
<td>$\check{s}$</td>
<td>$\check{\xi}$</td>
</tr>
</tbody>
</table>

In part of the Ukrainian language area, $d$ has come to alternate with $\check{\xi}$, whereby the alternation has become less reductive. An example of the replacement of one class of derived alternants with another: in Early Ukrainian, stem-final consonants alternated with one class of derived alternants in the 1st person singular and with another class of derived alternants in the 3rd person plural of second conjugation verbs (see (15) (A)).

(15) (A) (B) (C)

<table>
<thead>
<tr>
<th>basic</th>
<th>$t$</th>
<th>$d$</th>
<th>$s$</th>
<th>$\xi$</th>
<th>$\check{c}$</th>
<th>$\check{\xi}$</th>
<th>$\check{s}$</th>
<th>$\check{\xi}$</th>
<th>$p$</th>
<th>$b$</th>
<th>$f$</th>
<th>$m$</th>
<th>$v$</th>
<th>$n$</th>
<th>$l$</th>
<th>$r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st sg.</td>
<td>$\check{c}$</td>
<td>$\check{\xi}$</td>
<td>$\check{s}$</td>
<td>$\check{\xi}$</td>
<td>$\check{c}$</td>
<td>$\check{\xi}$</td>
<td>$\check{s}$</td>
<td>$\check{\xi}$</td>
<td>$pl$</td>
<td>$bl$</td>
<td>$fl$</td>
<td>$ml$</td>
<td>$vl$</td>
<td>$n$</td>
<td>$l$</td>
<td>$r$</td>
</tr>
<tr>
<td>3rd pl.</td>
<td>$t$, $d$, $s$, $\xi$, $\check{c}$</td>
<td>$\check{\xi}$</td>
<td>$\check{s}$</td>
<td>$\check{\xi}$</td>
<td>$pl$, $bl$, $fl$, $ml$, $vl$, $n$, $l$, $r$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(B) 3rd pl.</td>
<td>$t$, $d$, $s$, $\xi$, $\check{c}$</td>
<td>$\check{\xi}$</td>
<td>$\check{s}$</td>
<td>$\check{\xi}$</td>
<td>$pl$, $bl$, $fl$, $ml$, $vl$, $n$, $l$, $r$</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(C) 1st sg.</td>
<td>$t$, $d$, $s$, $\xi$, $\check{c}$</td>
<td>$\check{\xi}$</td>
<td>$\check{s}$</td>
<td>$\check{\xi}$</td>
<td>$pl$, $bl$, $fl$, $ml$, $vl$, $n$, $l$, $r$</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In some dialects, including the ones on which the standard language is based, part of the latter class of alternants has been replaced with part of the former (see (15) (B). In many dialects, the former class has been replaced in its entirety by the latter (see (15) (C); cf. the examples in (16)). All varieties of Ukrainian maintain the classes of alternants of (15)(A) unchanged in other loci (cf. Žylko 1966:94f.).

(16)  

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inf.</td>
<td>l,ubý-ty</td>
<td>l,úby-ty</td>
<td>l,ubý-ty</td>
</tr>
<tr>
<td>1st sg.</td>
<td>l,ubl,-ū</td>
<td>l,ubl,-ū</td>
<td>l,ubj-ū</td>
</tr>
<tr>
<td>3rd pl.</td>
<td>l,ūbj-ā-t</td>
<td>l,ūbl,-ā-t</td>
<td>l,ūbj-ā-t</td>
</tr>
</tbody>
</table>

5.4.3 Innovations in indexical value: As mentioned in 5.4.2, when an alternation has been defined as general in a certain locus, a decision must be made as to which class of alternants is basic and which derived. It is characteristic that what is materially one and the same alternation may be given different direction in different loci. This can be inferred from the different directions in which alternations are levelled when they lapse, for when an alternation is abandoned, it is the basic alternant that is generalized. Consider, for instance the $e \sim o$ alternation in Polish, which is generally levelled in favor of $o$ in nouns (i.e. vosna ‘spring; nom.sg.’, vosn-e ‘loc.sg.’, earlier véšn-e), but in favour of $e$ in the present tense of verbs (e.g. dialectal nes-e ‘carry; 1st sg.’, nes-e-s ‘2nd sg.’, earlier, and Standard Polish, nos-e, nes-e-s) (cf. Dejna 1973:184; Klemensiewicz et al. 1965:79).

The decision as to the direction of an alternation depends entirely on the indexical signata assigned to the class of derived alternants. These may be morphophonemic (5.4.3.1) or morphological (5.4.3.2).

5.4.3.1 In some Russian dialects, the alternation $γ \sim ζ$ in the present tense of verbs with stems in $γ$ — originally occurring as in (17) (A) — has been correlated with the stress, so that $γ \sim ζ$ before unstressed vocalic desinences. There are three accentual paradigms, fixed stem stress (B), fixed end stress (C), and mobile stress (D), and correspondingly three reflexes of the original consonant alternation (cf. Avanesov — Orlova 1965:156).

(17)  

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st sg.</td>
<td>γ</td>
<td>l,áž-u</td>
<td>str,īy-ū</td>
<td>moy-ū</td>
</tr>
<tr>
<td>2nd sg.</td>
<td>ź</td>
<td>l,áž-oš</td>
<td>str,īy-ōš</td>
<td>móž-oš</td>
</tr>
<tr>
<td>3rd sg.</td>
<td>ź</td>
<td>l,áž-ot</td>
<td>str,īy-ót</td>
<td>móž-ot</td>
</tr>
<tr>
<td>1st pl.</td>
<td>ź</td>
<td>l,áž-om</td>
<td>str,īy-ōm</td>
<td>móž-om</td>
</tr>
<tr>
<td>2nd pl.</td>
<td>ź</td>
<td>l,áž-ot,o</td>
<td>str,īy-ōt,o</td>
<td>móž-ot,o</td>
</tr>
<tr>
<td>3rd pl.</td>
<td>γ</td>
<td>l,áž-ut</td>
<td>str,īy-út</td>
<td>móž-ut</td>
</tr>
</tbody>
</table>
Patterns like this, where one morphophonemic alternation mirrors another so that they together form what may be called an automorphic structure in the paradigm, were first described explicitly by Shapiro, who gives several examples of existing or emerging patterns of this kind from contemporary Russian (1969). They can also be undone by morphophonemic innovation, as the next example suggests.

In many Russian dialects, verbs with stems in $k$ present two parallel alternations in the present tense paradigm, $k \sim č$ and $o \sim e$ (cf. (18) (A)). Historically speaking, the latter alternation is the younger of the two; it has its origin in a change of $e > o$, which did not take place before (inter alia) $č$. In some dialects, the consonant alternation has been eliminated, but the $o \sim e$ alternation is maintained — undoubtedly with morphological indexical value (cf. Avanesov — Orlova 1965:155); see (18) (B).

(18)  

\begin{tabular}{llll}
 & A & B \\
1st sg. & $p,ok-ǔ$ & $p,ok-ǔ$ \\
2nd sg. & $p,ěč-ออกแบบ$ & $p,ek-ออกแบบ$ \\
3rd sg. & $p,ěč-olt$ & $p,ek-olt$ \\
1st pl. & $p,ěč-óm$ & $p,ek-óm$ \\
2nd pl. & $p,ěč-olt,o$ & $p,ek-olt,o$ \\
3rd pl. & $p,ok-ǔt$ & $p,ok-ǔt$ \\
\end{tabular}

5.4.3.2 An alternation may be valuated as having morphological indexical value. In this case there are two possibilities: the derived alternant(s) may index morphological signantia or they may index morphological signata.

In Polish, the inherited alternation of stem final consonants (see (19) (A)) in original class IV verbs before the desinence of the first person singular $ς$ (B) has been extended so that it occurs also before 3rd person plural desinence $ο$ (C). It appears that the derived alternants index desinences that begin with a nasal vowel. (In other loci, the same alternants have other indexical values.) (Cf. Klemensiewicz et al. 1965: 364.)

(19)  

\begin{tabular}{llll}
 & A & B & C & D \\
č~č & 1st sg. & noš-ε & noš-ε & \\
ż~ż & 2nd sg. & noš-is & noš-is & \\
š~š & 3rd sg. & noš-i & noš-i & \\
ž~ž & 1st pl. & noš-imy & noš-imy & \\
 & 2nd pl. & noš-ître & noš-ître & \\
 & 3rd pl. & *noš-φ & noš-φ & \\
\end{tabular}
In Russian, the inherited alternation of stem final plain consonants with palatalized consonants before the nom. pl. desinence -i — whose locus has been restricted to two nouns (cf. 5.4.1) — has changed: the derived alternants have been valuated as indexes of ‘plural’, and stem final palatalized consonants correspondingly extended to all plural forms. Thus Modern Russian has such plural forms as sos,éd,-i ‘nom.’, sos,éd,-ej ‘gen.’, sos,éd,-am ‘dat.’ corresponding to Middle Russian sos,éd,-i, sos,éd-ov, sos,éd-am.

5.4.4 Morphological alternations: In 5.2.3 we saw how the -j- suffix which in most Russian dialects probably is a mere index of ‘plural’, in some dialects apparently has been valuated as symbolic and hence is being generalized as an absolute, real signans with an asynthetic signatum.

When an alternation is general (5.4) and the derived alternant(s) can be interpreted as a relative index of a grammatical signatum, as in the Russian example we have just seen (5.4.3.2), there exists in principle the alternative possibility that the derived alternant(s) be valuated as a relative signans with the grammatical content in question as symbolic signatum. Such an interpretation is particularly likely, one may suppose, when the grammatical signatum lacks a stable, real signans — either because the given signans comprises diverse allomorphs, or because it is zero.

A clear example from the derivational morphology of Russian is the non-suffixal formation of abstract nouns from adjectives, where the change in part of speech is symbolized by the derived alternants of stem final consonants, e.g. d,ik- ‘wild’, d,ič- ‘game (animals)’; t,ix- ‘quiet; adj.’, t,ıš- ‘quiet; subst.’; nov- ‘new’, nov,- ‘virgin soil’; krut- ‘steep’, krut,- ‘sheer cliff side’ (cf. Isačenko 1975:336f.).

In Western Jutish, the apocope of a, which affected various desinences, apparently prompted a transfer of grammatical signata to derived stem alternants. Now the plural of substantives is formed in part by a complex of alternations involving the prosodic features of stød (20) (A) and quantity (B) and the inherent feature of protensity, realized as length in sonorants (C) and preglottalization in stops (D). The same alternations serve to signal ‘plural’ and ‘definite’ in adjectives, and to differentiate the infinitive from the bare stem of the imperative and the preterite from the past passive participle. In addition, they accompany various suffixes, inflectional and derivational (cf. Ringgård 1960:14f.).

In cases like this, where a class of derived alternants alone functions as a relative signans for a grammatical signatum, it is appropriate to speak of a morphological alternation, as distinct from the morphophonemic alter-
nations which merely accompany inflection, and whose derived alternants, having only indexical value, serve to support and sharpen the expression of independently symbolized grammatical signata.

(20)

<table>
<thead>
<tr>
<th>Sg</th>
<th>Pl</th>
</tr>
</thead>
<tbody>
<tr>
<td>hu:?s</td>
<td>hu:s</td>
</tr>
<tr>
<td>go:?o</td>
<td>go:o</td>
</tr>
<tr>
<td>f?d</td>
<td>f?ːd</td>
</tr>
<tr>
<td>praesd</td>
<td>praːsd</td>
</tr>
<tr>
<td>fol</td>
<td>føːl</td>
</tr>
<tr>
<td>heysd</td>
<td>heːysd</td>
</tr>
<tr>
<td>bæŋk</td>
<td>bæŋk</td>
</tr>
<tr>
<td>størk</td>
<td>støːrk</td>
</tr>
<tr>
<td>hat</td>
<td>haːt</td>
</tr>
</tbody>
</table>

5.5 System-motivated innovations: The preceding survey of abductive innovations began with a discussion of the difference between apparently spontaneous innovations in morphological categories and the types of innovation which can be understood as motivated by indeterminacies in the speech data language learners have to analyse — indeterminacies which allow of alternative resolutions, one of which is an innovation (5.1.1–5.1.3). In the intervening sections, a number of types of innovation of the latter kind has been described — in morphology proper (5.2) and in morphophonemics (5.3 and 5.4). Here I should like to exemplify some types of innovation which cannot be understood simply as possible resolutions of indeterminate speech data, but to be explained require reference to the system into which the innovated elements are integrated.

In 5.2–5.4 we saw that the analysis of innovations motivated by indeterminacies in speech data requires constant attention to the indexical relations which make grammatical morphemes cohere with one another and with lexical morphemes. Diagrammatic relations hold a comparable place of importance in the explication of system-motivated innovations, for a linguistic system, one may maintain, is a structure constituted chiefly by diagrammatic relations. Although this insight is old and probably can be traced through the history of linguistics, it has not been stated in explicit terms until recent times (cf. Paul 1920:26f., 106f., 189f.), and it is only in Jakobson’s “Quest for the essence of language” (1965) that a first attempt has been made to formulate it in semiotic terms. As a consequence, there is as yet no answer to such questions as how extensive is the “compulsory diagrammatization” in language, or what kinds of diagrams can reasonably be posited as real, constitutive features of language structure. Historical morphology is likely to be able to help answer these questions.
Generally speaking, any change which leads to a simple mapping relation between content and expression can be viewed as a manifestation of the diagrammatic character of language structure. Several of the examples that have been examined above can be viewed as system motivated in this general way and could be categorized in terms of the formulaic representations used by Anttila (1972), e.g. the innovation by which the allomorphs of the Middle Russian genitive singular -a and -u were invested with distinct grammatical meaning (5.2.1.2): \( \wedge > || \); the one by which the allomorphy of the Middle Russian dative singular was reduced (5.3.3): \( \wedge > | \); the morphological differentiation of animate and inanimate nouns in the accusative in the Slavic languages (5.1.1): \( \vee > || \); the loss of gender distinctions following the reduction of desinences in English (5.1.2): \( \vee > | \). No doubt such diachronic correspondences, by whatever innovations they come about, indirectly reflect the diagrammatic character of language because they invariably involve deductive innovations, and these directly manifest the diagrammatic relations of the system.

Here, however, we will be concerned with abductive innovations that create new mapping relations among signata, between signata and signantia, and among signantia. We will consider first some types of innovations in morphology (5.5.1.1-5.5.1.4), then some morphophonemic innovations (5.5.2-5.5.2.3).

5.5.1.1 Innovations in valuation: In Old Russian, the numeral ‘two’ distinguished gender in the nominative (and accusative) — dv-a ‘masc.’ vs. dv-e ‘neut., fem.’. Texts from the late 1200’s on show a new valuation of the desinences — dv-a ‘masc., neut.’ vs. dv-e ‘fem.’ (cf. Kiparsky 1967:174).

One cannot assume that this innovation arose due to any indeterminacy in the use of the inherited forms. To understand it, it is necessary to take into account at least two circumstances. First, after the loss of the dual, a number of masculine nouns had retained the dual desinence -a as a nominative plural desinence; -a was the original desinence in the nominative plural of neuters; no feminines had a nominative plural in -a; in the nominative plural, then, -a had the inductive signatum ‘non-feminine’. Secondly, in the singular — in pronouns and adjectives, and in the 1st declension of substantives — the neuter shared all the desinences of the oblique cases with the masculine, so that in pronouns and adjectives, two paradigms were distinguished, one ‘feminine’, the other, ‘non-feminine’.

The new valuation, in other words, consisted in the primary gender opposition of the Russian nominal system — ‘feminine’ vs. ‘non-feminine’ — being projected onto the desinences of dv-a and dv-e, so that
the relation between their signata reflected the relation between the
gender signata of pronouns and adjectives. At the same time, the inductive
entailment \(-a \supset \text{'non-feminine'}\) of the substantival nominative plural
was imposed on \(dv-a\) as a deductive entailment, \('non-feminine' \supset -a\).

The innovation can hardly be understood otherwise than as motivated
by the structure of the gender system.

5.5.1.2 Paradigmatic reduction is a type of morphic innovation by which
the paradigmatic diversity of desinences with similar signata is reduced in
such a way that similarity of content comes to be reflected in a similarity of
signantia.

Independently of each other, Slovincian and Russian dialects have
changed the pronominal and adjectival desinence \(-ogo 'gen.sg., masc.-
neut.'\) to \(-ovo\). The changes cannot be understood as results of regular
phonetic change, but Russian dialect forms of the desinence \((-oho, -oo)\)
suggest that the new shape of the desinence has been inferred from
allegro forms (Borkovskij — Kuznecov 1965:250f.). The \(\nu\), however,
cannot be understood except on the basis of the morphological system.
These languages employed only six consonants in nominal desinences.
Several of these were clearly correlated with specific features of case
meaning — \(m\) and \(m\), with the peripheral cases (locative, dative, instrument-
mental), \(x\) with the quantifier cases (genitive, locative). \(g\) occurred only in
the genitive singular desinence \(-ogo\). \(\nu\) occurred only in the desinence \(-ov
'gen.pl.'\). This seems to explain how \(\nu\) could be imposed beside the \(g\),
which presumably continued to occur in lento forms of the desinence, and
could subsequently be generalized. One more factor in the morphology of
these languages which may be relevant is the fact that \(\nu\) occurred also in
the derivational suffix \(-ov-\) which forms possessive adjectives.

By the innovation, then, the diversity of signantia for the genitive was
reduced through the imposition of a familiar signsans element — in
defiance of the observable speech data, but with sufficient support in the
identity of content of the relevant morphemes. Understood in this way,
paradigmatic reduction has an exact counterpart in the kind of lexical
signans change termed folk etymology (sparrow grass for asparagus).
Both kinds of innovation can be viewed as the result of a learner's
strategy, a tendency to perceive as similar signantia with similar content.

Paradigmatic reduction can be contrasted with the innovations in inde-
xical signata discussed in 5.3.2. Both kinds of innovation lead to a
redistribution of allomorphs (here a levelling). In reality, however, there
may be an important difference between the alternations in inflectional
paradigms whose forms can be reasonably thought of as produced by
morphological rules, and allomorphy in a repertoire of desinences which
are probably learnt and produced as units. The former allow of innovations in the formulation of indexical relations, the latter probably do not.

5.5.1.3 Syntagmatic reduction is a simplification of signantia consisting in the omission either of individual diacritic signs or of whole segments.

All Russian dialects have lost the distinction between desinence final \( m \), (as in the original shapes of the desinences \(-om\), \(-im\), \(-em\), \(‘instr.sg.’\), \(om\) ‘loc.sg.’) and \(-m\) (as in the original shapes of the desinences \(-am\), \(-im\), \(em\), \(-um\), \(-om\) ‘dat.pl.’), omitting the diacritic sign “+sharped” (palatalized) from the former set of desinences. Similarly, North Russian dialects have reduced the 3rd person desinence from a palatalized \( -t \), to a plain \( -t \) (Borkovskij — Kuznecov 1965:119f., 312).

Reduction by whole segments is involved in the shortening of a number of desinences in Russian: the nominal desinences ORuss. \(-oje\) ‘gen.sg.’, \(-oji\) ‘dat.loc.sg.’, \(-oju\) ‘instr.sg.’ have become \(-oj\); the verbal desinences \(-si\) ‘2nd sg.’, and the unstressed infinitive \(-ti\) and imperative \(-i\) have become \(s\), \(-t\), and \(-\emptyset\) respectively (Borkovskij — Kuznecov 1965:157f.).

Syntagmatic reduction can be understood as the result of a learner’s strategy not to recognize more diacritic signs in morphological signantia than are necessary for their differentiation. Since syntagmatic reduction may lead to syncretism — e.g. the adjectival desinence \(-oj\) ‘gen.loc.dat.instr., fem.’ — this is clearly a system-motivated type of innovation through which relations among signata come to be reflected in relations among signantia.

5.5.1.4 Diagrams with relative signantia: Besides innovations in which a signatum — signans relation comes to mirror another (as in 5.5.1.1) or a relation among signata comes to be reflected by a corresponding relation between signantia — an opposition by distinct desinences, as in \(dv-a\) vs. \(dv,-e\) (5.5.1.1), similarity of content, by similar desinences, as in the case of \(ovo\) (5.5.1.2), or by a syncretism, as in the case of \(-oj\) (5.5.1.3) — there are innovations in which a relation between signata comes to be reflected in a similar relation between the phonological shapes of the corresponding signantia.

An example — which at the same time illustrates the abstract sort of motivation that produces such diagrams — is the development of the Russian substantival declensions. Here a number of separate innovations, each with its independent motivation, and exemplifying quite different types — have produced dative and instrumental singular desinences just one segment shorter than the corresponding plural desinences and nominative, genitive and instrumental plural desinences at most one segment longer than the corresponding singular desinences. It is difficult not
to see here a drift towards a diagram in which the opposition plural vs. singular (‘more than one’ vs. ‘unspecified number’) is reflected by a difference in number of segments (n + 1 vs. n) in the corresponding desinences (cf. Jakobson 1966/1971:202); see (21).

(21) Number of segments in the substantival desinences of Middle Russian and Modern Russian. Innovated desinences are starred.

<table>
<thead>
<tr>
<th></th>
<th>Middle Russian</th>
<th>Modern Russian</th>
</tr>
</thead>
<tbody>
<tr>
<td>I decl.</td>
<td>II decl.</td>
<td>III decl.</td>
</tr>
<tr>
<td>nom. sg.</td>
<td>0/1 1 0</td>
<td>0/1 1 0</td>
</tr>
<tr>
<td>acc.</td>
<td>0/1 1 0</td>
<td>0/1 1 0</td>
</tr>
<tr>
<td>gen.</td>
<td>1 1 1</td>
<td>1 1 1</td>
</tr>
<tr>
<td>loc.</td>
<td>1 1 1</td>
<td>1 1 1</td>
</tr>
<tr>
<td>dat.</td>
<td>1/3 1 1</td>
<td>*1 1 1</td>
</tr>
<tr>
<td>instr.</td>
<td>2 3 2</td>
<td>2 *2 2</td>
</tr>
<tr>
<td>nom.pl.</td>
<td>1/2/3 1 1</td>
<td>*1 1 1</td>
</tr>
<tr>
<td>acc.</td>
<td>1 1 1</td>
<td>1 1 1</td>
</tr>
<tr>
<td>gen.</td>
<td>0/2 0 2</td>
<td>0/2 *0/2 2</td>
</tr>
<tr>
<td>loc.</td>
<td>2 2 2</td>
<td>2 2 2</td>
</tr>
<tr>
<td>dat.</td>
<td>2 2 2</td>
<td>2 2 2</td>
</tr>
<tr>
<td>instr.</td>
<td>1/2 3 2</td>
<td>*3 3 *3</td>
</tr>
</tbody>
</table>

5.5.2 Innovations in alternations are more obviously system-motivated than are innovations in morphological sign relations. For the latter are paradigmatic relations, relations to entities in absentia, but alternations involve the palpable indexical relations on the syntagmatic axis between signantia and the signata of neighbouring morphemes and among the signantia of contiguous morphemes.

This web of indexical relations is not to be dismissed as a redundant, counter-functional encumbrance of the morphology. The fact that morphophonemic alternations are not uniformly curtailed and eliminated in the history of a language, but may be reformulated and retained as productive formal means, suggests that they may have some vital function beyond the obvious one of providing useful cues for the speakers in decoding messages. It is reasonable to see that function in their ability to diagram paradigmatic relations among signata.

Since innovations in alterations, by virtue of the indexical value of derived alternants, tend to be system motivated, the following sections will — with the exception of 5.5.2.1 — merely point to diagrammatic aspects of the types of innovations already reviewed in 5.3–5.4.
5.5.2.1 Retroduction: Indeterminacies in the locus of an alternation or in the indexical value of its derived alternants may lead to various types of innovation — including the extension of the alternation — as seen in 5.4. Retroduction might serve as the name of a type of innovation by which an alternation is extended through the creation of base forms that have no support in speech data.

South Russian dialects — which characteristically neutralize the opposition $o : a$ in unstressed syllables, realizing both vowels as [a] — have a strong tendency to switch end-stressed 2nd conjugation verbs to a mobile stress pattern. By this change, stem vowels which have previously been unstressed come to be stressed, and the previously pretonic [a] commonly appears as a stressed $o$ (e.g. in such verbs as Standard Russian $vəl$\texttt{t}, $vəp$\texttt{t}, $dər$\texttt{t}, $zvən$\texttt{t}, $kət$\texttt{t}, $səd$\texttt{t}, $pət$\texttt{t}; cf. Avanesov — Orlova 1965:157f.); see (22).

(22)

<table>
<thead>
<tr>
<th>North Russian dialects</th>
<th>South Russian dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inf.</td>
<td>End-stressed</td>
</tr>
<tr>
<td>$nəs$\texttt{t}, $zvən$\texttt{t}, $dər$\texttt{t}</td>
<td>$nəs$\texttt{t}, $zvən$\texttt{t}, $dər$\texttt{t},</td>
</tr>
<tr>
<td>1 sg. $nə$\texttt{s-ǔ}</td>
<td>$nə$\texttt{s-ǔ}</td>
</tr>
<tr>
<td>2 sg. $nə$\texttt{s,-i-şi}</td>
<td>$nə$\texttt{s,-i-şi}</td>
</tr>
</tbody>
</table>

There is no doubt that the neutralization rule produces unstressed [a] from underlying $o$ and $a$, and the innovated verb forms can only be understood as hypothetical base forms which come to the surface thanks to the stress pattern innovation. It is significant that some verbs with original pretonic $o$ through the innovation in stress pattern come to have a stressed stem vowel $a$ (e.g. $ləv$\texttt{t}, $səl$\texttt{t}; cf. loc.cit); see (23).

(23)

<table>
<thead>
<tr>
<th>North Russian dialects</th>
<th>South Russian dialects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inf.</td>
<td>End-stressed</td>
</tr>
<tr>
<td>$ɡəs$\texttt{t}, $səl$\texttt{t}</td>
<td>$ɡəs$\texttt{t}, $səl$\texttt{t},</td>
</tr>
<tr>
<td>1 sg. $ɡə$\texttt{s-ǔ}</td>
<td>$ɡə$\texttt{s-ǔ}</td>
</tr>
<tr>
<td>2 sg. $ɡə$\texttt{s,-i-şi}</td>
<td>$ɡə$\texttt{s,-i-şi}</td>
</tr>
</tbody>
</table>

Retroductive innovations presuppose a learner's strategy to go behind surface forms to postulate underlying representations. The strategy applies an already acquired command of rules of the language, and the innovations to which it gives rise are thus system-motivated.

The preceding example illustrates retroduction involving a phonological rule. Russian nouns like $öčərk$ 'sketch', $ötpəsk$ 'leave', retroduced
from derived imperfective verbs (earlier očerčát, 'outline', otpuščát, 'let go') containing an ambiguous č — in spite of the existence of the perfective verbs očerčít, otpustít, the substantive čertá 'line', and the adjective pustój 'empty, deserted', are examples of the same kind, only from derivational morphology.

5.5.2.2 Alternations as diagrams: Morphophonemic alternations are among the most complex semiotic phenomena of language. A derived alternant represents, as a symbolic signatum, the basic alternant from which it is derived. At the same time, it has an indexical signatum, some element(s) of a contiguous morpheme. But in addition, it forms together with its basic alternant a diagram, for the relation between the two mirrors the relation between the elements of the context to which each of them indexically refers.

Such diagrams arise by virtue of the fact that the derived (marked) alternant — if the alternation is to be defined at all — must be assigned a specific, indexical value. This may be achieved in two ways. Either a narrowly defined part of the total range of environments in which the alternants occur is specified as the privilege of occurrence of one of the alternants, which thereby becomes marked. This possibility is illustrated, for instance, by the -s—x- alternation in the Early Slavic aorist morpheme (5.3.1) and by the -e—o- alternation in the present tense of the Russian type (C) dialects (5.3.2). Or — and this is the more interesting possibility — one of the alternants is defined as an index of some specific, intrinsically marked feature within the range of environments of the alternation. In such cases, the markedness relation between the alternants diagrams the markedness values of terms of a phonological, grammatical, or lexical opposition, e.g. sharping (5.3.1), nasality (5.4.3.2), number (5.3.2(B), 5.4.1, 5.4.3.2), animacy (5.3.2), quantifier (5.3.3).

The high frequency with which alternations are defined in such a way that they diagram grammatical oppositions is reflected in the fact that, when alternations are eliminated, it is as a rule the alternant proper to the unmarked category (the singular, the third person, the present tense, the indicative) that is generalized; cf. Mańczak's fourth law (1963) and Vennemann 1972.

The principle according to which derived alternants are assigned to marked contexts has been named markedness assimilation (Andersen 1968:75). The importance of this principle — which is undoubtedly deeply rooted in man's faculties of mind — extends far beyond the limits of morphophonemics (cf. Andersen 1972:44f.). But within morphophonemics it has the effect of projecting relations of equivalence in
Morphological change: towards a typology

markedness onto the syntagmatic axis, as relations of contiguity (cf. Jakobson 1964:358). In morphophonemic innovations, it has the effect of ensuring that alternations to the greatest possible extent are motivated by the system.

5.5.2.3 Diagrams with relative signantia: As a final example of diagrammatization through morphophonemic alternants I will mention the redistribution of desinence initial vowels in the endings of the locative, dative, and instrumental plural in Russian.

The Middle Russian desinences for these cases ((24) (A)) contained initial vowels which did not express case meaning and were distributed in a most complicated fashion, apparently by morphophonemic rules. In an abductive innovation, -a-, which had the inductive indexical signatum 'substantival stem' was made a deductive index of substantives and generalized. As a consequence, -e- became restricted to adjectival pronouns and -o- to the numerals 'three' and 'four', with the result that the desinence initial vowels all became indexes of parts of speech (cf. (24) (B)).

(24) (A) The Middle Russian locative, dative, and instrumental plural desinences.

<table>
<thead>
<tr>
<th>Substantives</th>
<th>Adjectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>loc.</td>
<td>II</td>
</tr>
<tr>
<td>dat.</td>
<td>om</td>
</tr>
<tr>
<td>instr.</td>
<td>im,i</td>
</tr>
</tbody>
</table>

Pers. Anaph.

loc. as | ix | \{ Pronouns \} |

dat. am | im | em/im |

B) The Modern Russian locative, dative, and instrumental plural desinences.

Substantives | Pronom. adj. | Adjectives | ‘two’ | ‘three, four’ |
|-------------|-------------|------------|-------|--------------|
loc. | ax ex ix | ix | ux ox |
dat. | am | em im | im | um om |
instr. | am,i | em,i im,i | im,i | um, a (o)m, a |

The resulting distribution of desinence initial vowels is not just a matter of the five vowels functioning as absolute signantia with indexical value.
It is remarkable that the maximally unmarked vowel \( a \) corresponds to the least restricted nominal part of speech, the substantive. Among the unrounded vowels, the more marked \( e \) points to the closed class of adjectival pronouns, while the less marked \( i \) points to adjectives in general. The marked, rounded vowels index the most restricted nominal part of speech, the numerals, the more marked \( o \) corresponding to the less frequent 'three' and 'four', the less marked \( u \) to the more frequent 'two'.

Thus in these desinences, the relations among the nominal parts of speech are diagrammed by the markedness relations of the vowel system.

5.6 In closing this survey of abductive innovations it is appropriate to add some comments on the presentation of the examples.

I have tried to distinguish types of innovations which may arise out of indeterminacies in speech (5.2–5.4), types of innovations which are motivated by particular features of the system into which they are integrated (5.5), and types of innovations that are called forth by typological properties of the system (5.1). This division of the survey into major classes of innovations corresponds to a methodological requirement in the analysis and interpretation of innovations, that the different kinds of motivation be explicitly distinguished. It is not to be understood as a claim that in reality, innovations in inflectional morphology are of one or the other type.

In the presentation of the examples in 5.2–5.4, the main emphasis was on the indeterminacies in speech which allow of alternative resolutions in the abductive process. In the sections dealing with system-motivated innovations (5.5), we were able to return to several of these examples to show that the actual resolutions depend in part on the structure of the morphological system. Typological factors were considered explicitly only in 5.1, but it goes without saying that these abstract properties of the design of a language play a role in all kinds of innovations. This means that the examples that have been given here to illustrate individual kinds of innovation have been presented with considerable simplification, which is justified by their use here as examples, but which must be noted together with the other simplifications (mentioned in 4.0) imposed by the character of the presentation and the purpose it is intended to serve.

6.0 In the introduction I stated that the aim of a typology of change is to give a systematic account of our experience with different kinds of innovation, a categorization of the possible which can be used as a heuristic tool in investigating individual changes and as a framework for that sorting of our data which must precede any attempt to formulate laws of change.
The preceding attempt at a systematization possibly falls short of this goal in several ways. Important types of innovation in inflectional morphology may have been overlooked. Important aspects of some of the types that have been defined may have gone unnoticed. I may not have succeeded in defining all the types I have identified consistently and correctly. Such shortcomings are unavoidable in an account that is limited to one man’s experience with languages of a particular type. But I would hope that the survey given here will stimulate discussion of types of innovation in the history of languages of other types, and that some of the distinctions that have been assumed as essential here will help focus interest on aspects of historical morphology which so far have received scant attention or none at all.

Despite its preliminary character, I hope to have demonstrated that the theoretical assumptions embodied in this typology of innovations make it applicable as a heuristic tool in the analysis of changes in morphology. It is clear that the more articulate one’s model of change, and the more refined one’s theory of morphology, the more relevant questions one can put to the data to be analysed, and the greater are the chances of getting pertinent answers. But whether the typology proposed here is adequate — and, if not, how it should be amended — these are questions that can only be answered if it is confronted with the experience of other linguists.

The ultimate aim of historical morphology, that of formulating laws of change, has not been particularly relevant to this survey. A few remarks about apparent learner’s strategies have been made en passant, but on the whole it seems to be too early yet in the development of the discipline to speculate on laws of change. Before this can be done, considerable quantities of data from different types of languages will have to be analysed — in greater detail than has been customary — and categorized according to uniform criteria, perhaps along the lines suggested here.

The fact that I have made no use of the term analogy in this study, finally, requires a word of comment. The term and the notion have been so widely used to describe relations among surface forms at different stages of a language — that is, to describe diachronic correspondences — that they are best avoided altogether in a theory of change that consistently analyses diachronic correspondences into sequences of innovations. There are deductive innovations which can be described as analogical. But these are accounted for by referring to the synchronic rules that produce them, and not by citing similar surface forms. There are abductive innovations which can be described as analogical. But these, too, are more appropriately explained by reference to the features of the grammar that have motivated them. If one finds, for instance, at a certain stage, that one set of forms have been segmented in a similar way to
another set of forms, the question must be asked whether this new segmentation was motivated by surface ambiguities in the forms in question, whether it conformed to existing rules of the language, whether it conformed to typological properties of the language, and whether it was dictated by some general principle of language structure manifested as a learner’s strategy. If the discovery of a surface analogy prevents these questions from being asked — and this has too often been the case in the past — the term and the notion should be abandoned. If it does not prevent the investigator from asking and seeking to answer these questions, the term and the notion do no harm, but neither do they contribute anything. In the areas of historical morphology where the concept of analogy has had a legitimate function, in questions of explicating the mapping relations between content and expression, it seems better to avoid the term and redefine the notion as part of the semiotic conceptual framework that appears to be called for in the investigation of language.

References

Alexander, Ronelle
1976 Torlak accentuation (= Slavistische Beiträge 94) (München: Otto Sagner).

Al’muxamedova, Z. M.

Andersen, Henning

Anttila, Raimo
1975 The indexical element in morphology (= Innsbrucker Beiträge zur Sprachwissenschaft, Vorträge 12) (Innsbruck: Institut für Sprachwissenschaft der Universität).
Morphological change: towards a typology

Avanesaw, R. I.

Avanesov, R. I.—V. G. Orlova

Borkovskij, V. I.—P. S. Kuznecov

Bromlej, S. V.—L. N. Bulatova

Brugmann, Karl

Bulatova, L. N.

Bulaxovskij, L. A.

Coseriu, Eugenio
1958 Sincronia, diacronia e historia: el problema del cambio lingüístico (Montevideo: Universidad de la República).

Greenberg, Joseph H.

Gvozdev, A. N.
1949 Formirovanie u rebënka grammaticeskogo stroja russkogo jazyka, 1-II [The formation of Russian grammatical structure in a child] (Moskva: Izdatel’stvo Akademii pedagogiceskix nauk).

Haas, William
1957 Studies in linguistic analysis (= Special Publication of the Philological Society).
Henning Andersen

[Reprinted in part as “Zero in linguistic description” in: Linguistics in Great Britain II, edited by Wolfgang Kühlwein (Tübingen: Niemeyer), 75–84.]

Halle, Morris

Hjelmslev, Louis

Huntley, David G.

Isačenko, Aleksander V.

Jakobson, Roman

Kernyc’kyj, I. M.
1967 Systema slovovzminy v ukrajinskij movi [The system of inflection in Ukrainian] (Kyjiv: Naukova Dumka).

Kiparsky, Valentin

Klemensiewicz, Zenon — Tadeusz Lehr-Splawiński — Stanisław Urbańczyk

Kuryłowicz, Jerzy
1964 The inflectional categories of Indo-European (Heidelberg: Carl Winter).

Kuz’mina, I. B. — E. V. Nemčenko
1971 Sintaksis príčastnyx form v russkix govorax [The syntax of participial forms in Russian dialects] (Moskva: Nauka).

Leed, Richard L.
Morphological change: towards a typology

Lounsbury, Floyd G.
1953 Oneida verb morphology (New Haven: Yale University Press).

Malkiel, Yakov

Mańczak, Witold

Matthews, Peter H.

Mirčev, Kiril

Obnorskij, S. P.
1953 Očerki po morfologii russkogo glagola [Outline of the morphology of the Russian verb]; (Moskva: Izdatel'stvo Akademii Nauk).

Osthoff, Hermann
1879 Das physiologische und psychologische Moment in der sprachlichen Formenbildung (Berlin: Habel).

Paul, Hermann

Ringgärd, Kristian

Samijlenko, S. P.
1964 Narysy z istoryčnoji morfolohiji ukrajins'koji movy I [Outline of historical Ukrainian morphology] (Kyjiv: Radjans'ka škola).
1970 Narysy z istoryčnoji morfolohiji ukrajins'koji movy II [Outline of historical Ukrainian morphology] (Kyjiv: Vyšča škola).

Samuels, M. L.

Sapir, Edward

Senn, Alfred

Shapiro, Michael


Stang, Christian S.
1942 Das slavische und baltische Verbum (Oslo).


Stern, Gustav
Schooneveld, Cornelius H. van

Vážný, Václav

Vennemann, Theo

Veyrenc, Jacques

Wheeler, Benjamin Ide
1887  *Analogy and the scope of its application in language.* Reprinted 1965 (New York: Johnson).

Żylko, F. T.