

DIACHRONIC MORPHOLOGY: AN OVERVIEW

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As synchronic morphological theory has flourished in recent years, evidenced by the recent spate of books in this area (e.g. Anderson 1992, *inter alia*), it is important to realize that, as with all aspects of language (and indeed of human institutions in general), a diachronic perspective is possible as well, focusing on what happens to morphology through time. Thus in this paper, several questions are addressed which are diachronic in their focus:¹

- what can change in the morphological component?
- what aspects of the morphology are stable?
- where does morphology come from?
- what triggers change in the morphology?
- is a general theory of morphological change possible?

Moreover, through the answers given to these questions, but especially the first two, several examples of various types of morphological change are presented as well.

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1. What can change? What is stable?

The easy answer here is that just about everything that might be thought of as constituting morphology is subject to change, especially so once one realizes that regular sound change can alter the shape of morphs without concern for the effect of such a change in pronunciation on the morphological system;² thus, for example, once-distinct case-endings can fall together by regular sound change (as a type of “syncretism”), as happened with the nominative plural, accusative plural, and genitive singular of (most) consonant-stem nouns in Sanskrit.³ Still, morphological change goes beyond mere change induced by sound change, affecting not just the actual realizations of morphemes but also the categories for which these forms are exponents and the processes and operations by which these forms are realized. Thus it is possible to find change in the form taken by the various types of inflectional morphology, such as markings for person, number, gender, agreement, case, and the like, as well as the addition or loss or other alteration of such categories and the forms that express them; in the derivational processes by which stems are created and modified, and in the degree of productivity shown by these processes; in the morphological status (compound member, clitic, affix, etc.) of particular elements; in the overt or covert relationships among morphological elements, and more generally, in the number and nature of the entries for morphemes and words in the lexicon; etc. Some examples are provided below.⁴

For instance, the category of person in the verbal system of Greek has seen several changes in the form assumed by specific person (and number) endings. Ancient Greek allomorphy between *-sai* and *-ai* for the 2SG.MEDIOPASSIVE.PRESENT ending (generally⁵ distributed as *-sai* after consonants, e.g. perfect indicative *tétrip-sai* ‘you have (been) rubbed ((for) yourself)’, from *trīb-ō* ‘rub’, and *-ai* after vowels, e.g. present indicative *timái* ‘you honor (for) yourself’, contracted from */timae-ai/*, or *lúēi* ‘you are unloosing for yourself’, contracted from */lúe-ai/*) has been resolved (and ultimately, therefore, reduced) through the continuation of a process begun in Ancient Greek (note vowel-stem middle

²This statement conceals a large controversy which cannot adequately be discussed here, namely whether sound change is a purely mechanical phonetic process that is blind to the specific morphemes and words it operates on and to their morphological composition, e.g. whether they are morphologically complex or monomorphemic. Thus in principle, one could imagine that sound changes could be morphologically conditioned, and so could fail to apply in, or could apply only to, certain categories or particular morphemes. The evidence, however, seems to be in favor of viewing sound change as being only phonetically conditioned in its outcome at least, with apparent cases of nonphonetic (so-called “grammatical”) conditioning being the result of phonetically conditioned sound change followed by analogical (morphological) change. See Hock 1976 for some discussion and relevant literature.

³These endings all have the form *-as* in Sanskrit, but, as comparisons with other Indo-European languages show, they derive from three different sources (GEN.SG **-os*, cf. Greek *pod-ós* ‘of a foot’, NOM.PL **-es*, cf. Greek *pód-es*, ACC.PL **-ης*, cf. Greek *pód-as*).

⁴These examples are drawn primarily from the languages I know best and thus am best able to vouch for; they therefore have what might be perceived as an Indo-European bias. However, there is every reason to believe that the same types of examples are to be found in other languages, and that the phenomena illustrated here are not Indo-European-only types of changes. See, for instance, Bloomfield (1946: §18-20), Anttila (1972: 91, 97), Robertson 1975, Hock (1991: 200-2), and Dai 1990 for some examples from Algonquian, Estonian, Mayan, Maori, and Mandarin Chinese, respectively, to mention just a few well-established cases from other language families.

⁵But see below regarding forms like *deiknusaí* that disturb this otherwise regular allomorphic pattern.

forms like *deiknu-sai* 'you are showing (for) yourself' already in Classical Greek) that resulted, via the extension of one allomorph into the domain of the other, in the generalization of the postconsonantal form into all positions in Modern Greek, giving, e.g. *timáse* 'you honor yourself' (as if from earlier **tima-sai*). Similarly, in some Modern Greek dialects, the ending for 3PL.MEDIOPASSIVE.IMPERFECTIVE.PAST has innovated a form *-ondustan* from the *-ondusan* found elsewhere; the involvement (via a type of change often referred to as contamination or blending) of the 1PL/2PL endings *-mastan* / *-sastan* is most likely responsible for the innovative form, inasmuch as the innovative form shows the introduction of an otherwise unexpected *-t-* in exactly the same point as in the 1PL/2PL endings.⁶ As a final example, from verbal endings but from a different language group, there is the case of the West Germanic 2SG.ACTIVE ending; the inherited ending from Proto-Germanic was *-iz (as in Gothic *-is*), yet it underwent the accretion of a marker *-t*, giving forms such as Old English *-est*, Old High German *-ist*, which is widely held to be a reflex of an enclitic form of the second person pronoun *þu* bound onto the end of a verbal form (thus probably the result of cliticization, on which see below).⁷

A change in the realization of number marking alone can be seen in the familiar case of the nominal plural marker /-s/ in English, for it has been spreading at the expense of other plural markers for centuries. For instance, the earlier English form *shoo-n*, as a plural of 'shoe', with the plural ending *-n* still found in *oxen*, has given way to *shoe-s*, with the most frequent and indeed default plural ending *-s*; in this case, the marker has not passed from the language altogether, as *oxen* shows, but the domain of a particular marker has come to be more and more restricted and that of another has been expanded. The "battleground" here in the competition between morphemes is constituted by particular lexical items and the markings they select for.⁸

Somewhat parallel to such changes in the form of endings themselves are changes in effects associated with the addition of such endings. The affixation of the plural marker /-s/ in English occasions voicing of a stem-final fricative with a relatively small set of nouns, all inherited from Old English, e.g. *loaf* ([lowf]) / *loaves* ([lowv-z]), *house* ([haws]) / *houses* ([hawz-əz]), *oath* ([owθ]) / *oaths* ([owð-z]), etc., though the default case now is to have no such voicing, as indicated by the fact that nouns that have entered the language since the Old English period do not participate in this morphophonemic voicing, e.g. *class*, *gaff*, *gas*, *gauss*, *gross*, *gulf*, *mass*, *oaf*, *puff*, *safe*, *skiff*, etc. Many nouns that do show this voicing are now fluctuating in the plural between pronunciations with and without the voicing, so that [owðs] for *oaths*, [(h)worfs] for *wharves*, and [hawzəz] for *houses* can be

⁶The Ancient Greek innovative 1DUAL.MEDIOPASSIVE ending *-methon*, which filled a gap in the paradigm (note the absence of a 1DUAL.ACTIVE form) and seems to have arisen as a blend of 1PL.MEDIOPASSIVE ending *-metha* with the 2DUAL.MEDIOPASSIVE ending *-sthan* (note also the 2DUAL.ACTIVE *-ton*), provides another example of a change in a personal ending due to blending.

⁷The enclitic form, occurring as it does with a stop, presumably reflects a combinatory variant of *þu* after a sibilant.

⁸See Anderson 1988 for discussion of the spread of the *s*-plural in English; he argues that the mechanism is one of the elimination of lexically specified idiosyncrasies and the emergence of the default marking; he notes that this interpretation is consistent with, and in fact predicted by, the principle of disjunctive ordering for morphological rules. For a similar example from German, where an *-s* marking for plural is spreading, see Janda 1990.

heard quite frequently.⁹ It is likely that the innovative pronunciations will eventually "win out", thereby extending the domain of the default plural marking and essentially assimilating this class of nouns to the now-regular class.¹⁰

The creation of new markers also represents a change. Thus when the early Germanic nominal suffix *-es-, which originally was nothing more than a stem-forming element, i.e. an extension onto a root to form certain neuter noun stems, as indicated in the standard reconstruction NOM.SG **lamb-iz* 'lamb' versus NOM.PL **lamb-iz-ā*,¹¹ was reinterpreted after sound changes eliminated the final syllable of the singular and plural forms, as a marker of the plural, a change in the marking of (certain) plural nouns in Germanic came about.¹² The ultimate form of this marker, -(e)r with the triggering of umlaut in the root (e.g. OHG nominative singular *lamb* / nominative plural *lambir*, NHG *Wort* / *Wörter* 'word/words') reflects the effects of other sound changes and reinterpretations involving umlaut in the root triggered by suffixation.¹³

With regard to case markings, one can note that evidence from unproductive "relic" forms embedded in fixed phrases points to an archaic Proto-Indo-European inflectional marker *-s for the genitive singular of at least some root nouns, which was then replaced in various languages for the same nouns as *-es or *-os, which existed as allomorphic variants already in Proto-Indo-European in use with different classes of nouns. For example, the Hittite form *nekuz* 'of evening' (phonetically [nek^wt-s]), in the fixed phrase *nekuz mehur* 'time of evening', with its *-s ending, can be compared with Greek *nukt-ós*, Latin *noct-is*, with the innovative endings *-os/-es.¹⁴ Similarly, the genitive ending *-os (as above, with a variant *-es) which can be inferred for *n*-stem noun such as *óno-ma* 'name'

⁹For instance, [owθs] and [(h)worf] are given in *AHD* (1992) as (innovative) variants; [haw səz], while common in Central Ohio at least, has not yet been enshrined in the dictionary.

¹⁰As with the spread of the *s*-plural (see footnote 8), this loss of morphophonemic voicing can be seen as the removal of an idiosyncratic specification from the lexical listing of each such noun. See also Anttila (1972: 126-127) for discussion of this example and of parallel ones involving consonant gradation from Baltic Finnic. It should be noted that occasionally, the idiosyncratic marking has spread to a noun not originally undergoing this process; for example, *dwarf* originally had no overt plural marker in Old English, so that the variant plural *dwarves*, alongside the synchronically more regular *dwarfs*, represents a spread of the synchronically irregular pattern.

¹¹See, for example, Prokosch 1938 for this reconstruction.

¹²The situation is actually a bit more complicated, as is clear from the fact that early Old High German had *-ir-* in some singular forms, specifically the genitive and the dative; as the suffix came to be interpreted purely as a marker of number, as the nominative forms would lead a speaker to surmise, it disappeared from the genitive and dative singular. See Anderson 1988 for further discussion, and an interpretation in terms of changes in lexical specifications.

¹³Note also that since in earlier stages of Germanic, *Wort* did not have this plural marking (cf. OHG SG *wort* / PL *wort*), the extension of this umlaut-plus-(e)r plural marking is a process parallel the example given of the *-s* plural in English; see also footnotes 8 and 12.

¹⁴That this archaic inflection is embedded in a fixed phrase (similarly also Vedic Sanskrit *dan* 'house/GEN.SG', from **dem-s*, found in the fixed phrase *patir dan* 'master of the house') is not surprising, for it shows the retention of an older pattern in what is in essence a synchronically unanalyzable expression (like an idiom). From a methodological standpoint in doing historical morphology and morphological reconstruction, it is often useful to look to such expressions for clues as to earlier patterns.

(with *-ma* from **-m̥n̥*)¹⁵ in Pre-Greek based on the evidence of Sanskrit *nāmn-as* and Latin *nomin-is* 'of a name'¹⁶ underwent a cycle of changes in historical Greek. It was first altered through the accretion of a *-t-*, giving *-tos* (e.g. *onóma-tos*); although the exact source of this *-t-* is disputed and although it is found ultimately in other cases, it seems to have arisen earliest with the genitive, and so its appearance perhaps shows some influence from an ablative adverbial suffix **-tos* found in forms such as Sanskrit *ta-tas* 'then, from there' or Latin *caeli-tus* 'from heaven'.¹⁷ Whatever its source, though, it at first created a new genitive singular allomorph *-tos*, yet later when this *-t-* was extended throughout the paradigm, giving forms such as the dative singular *onóma-t-i* (for expected **ónomn-i*, cf. Sanskrit locative *nāmn-i*), the *-t-* became a virtual stem extension. At that point, one could analyze *ónoma* as having been "relexicalized" with a different base form /onomat-/, thereby reconstituting the genitive ending again as *-os* for this noun class.

Another relatively common type of change in the realization of case-endings involves the accretion of what was originally a postposition onto a case-suffix, creating a virtual new case form. This process seems to have been the source of various "secondary local" cases in (Old) Lithuanian (Stang 1966: 175-6, 228-32), such as the illative, e.g. *galvôn* 'onto the head', formed from the accusative plus the postposition **n* (with variant form **na*) 'in' (probably connected with Slavic *nā* 'on') and the allative, e.g. *galvôspi* 'to(ward) the head', formed from the genitive plus the postposition **pie* (an enclitic form of *priē* 'at'), where influence from neighboring (or substrate) Balto-Finnic languages is often suspected as providing at least a structural model.¹⁸ Similar developments seem to underlie the creation of an innovative locative in Oscan and Umbrian, e.g. Oscan *húrtín* 'in the garden' (so Buck 1928:114), where a postposition *en* is responsible for the form of the ending, and may be viewed in progress in the alternation between a full comitative postposition *ile* 'with' in modern Turkish (e.g. *Ahmet ile* 'with Ahmet', *Fatma ile* 'with Fatma') and a bound suffix-like element *-(y)le* (with harmonic variant *-(y)la*) e.g. *Ahmetle*, *Fatmayla*).¹⁹ It should be noted, however, that though common, the development these combinations apparently show, from noun-plus-free-postposition to noun-plus-case-suffix, is not unidirectional; Nevis (1986), for instance, has demonstrated that in most dialects of Saame (also known as Lappish) an inherited sequence of affixes **-pta-k-ek/n* marking abessive has become a clitic word (*taga*, with variant *haga*), and more specifically a stressless postposition,

¹⁵The reconstruction of the root for this word is somewhat controversial, and only the stem suffix is at issue here, so no attempt is made to give a complete reconstruction.

¹⁶The **-os/-es* ending in these languages may itself be a late PIE replacement for an earlier simple **-s* ending, based on such forms as the Old Irish genitive singular *anmae* 'of a name', where the ending is from **-men-s* (so Thurneysen 1970: 60); hence the specification "Pre-Greek" is used here for the ending since it may not be the oldest form of this inflectional ending with this noun in PIE.

¹⁷A *-t-* extension is found with several other nominal stem classes in Greek, for instance, the neuter *-as-* stems, but it is not found with all members of the class and a few specific nouns, e.g. *kréas* 'meat' show it earliest in the genitive singular (4th century BC), with spread to other case-forms coming much later. Even with a noun like *ónoma* which, as noted below, shows the extension of the *-t-* into other case forms, early (Homeric) Greek shows no (metrical) trace of the *-t-* in the dative plural (see Chantraine 1973:74-75, 82-83).

¹⁸See Thomason & Kaufman (1988: 242-243) for some discussion of the substratum hypothesis, though Stang (1966: 228-9) argues against this view.

¹⁹That this one-time postposition has become a true case ending in Oscan is shown by its appearance on an adjective, in apparent agreement with the noun it modifies; see Buck (1928: 114) for this interpretation.

while in the Enontekiö dialect, it has progressed further to become a nonclitic adverb *taga*.²⁰

As the Turkish example suggests, in Lithuanian and Oscan, there most likely was a period of synchronic variation between alternates before the ultimate generalization of a new case-form.²¹ There can also be variation of a cross-linguistic sort here, in the sense that what is ostensibly the same development, with a postposition becoming a bound element on a nominal, might not lead to a new case-form, if the overall "cut" of the language does not permit the analysis of the new form as a case-marked nominal. For instance, the special first and second person singular pronominal forms in Spanish, respectively, *migo* and *tigo*, that occur with the preposition *con* 'with' and which derive from Latin combinations of a pronoun with an enclitic postposition, e.g. *mē-cum* 'me-with', could be analyzed as oblique case-marked pronouns. However, they are probably not to be analyzed in that way, since there is no other evidence for such case-marking in the language, neither with pronouns other than these nor with nouns; one could just as easily, for instance, treat the element *-go* as part of a(n admittedly restricted) bipartite discontinuous "circumposition" *con...-go*.²²

As the examples involving the creation of new case forms shows, inflectional categories, e.g. ALLATIVE in Old Lithuanian, can be added to a language. Indeed, a typical change involving categories is the addition of a whole new category and the exponents of that category, though sometimes the addition is actually more a renewal of a previously existing category. Loss of categories, though, also occurs. For instance, historical documentation reveals clearly that the dual was present as an inflectional category in the verbal, nominal, and pronominal systems of early Greek (cf. the Ancient Greek ending ²*methon* mentioned above in note 6), yet there are no traces of the dual in any system in Modern Greek; similarly, a dual category is assumed for the Proto-Germanic verb based on its occurrence in Gothic and is attested for the personal pronouns of earlier stages of the Germanic languages (e.g. Old English *ic* 'I' / *we* 'we/PL' / *lā* 'wit' 'we/DU'), yet such pronominal forms are not found in any of the modern Germanic languages, and verbal dual forms occur nowhere else among the older, nor indeed the more recent, Germanic languages. Thus as an inflectional category, one for which paradigmatic forms exist or might be expected to exist, dual number is no longer present in Greek or Germanic. Similarly, there was a loss of a synthetic perfect tense between Ancient Greek and late Koine Greek, so that Ancient forms such as *léluka* 'I have untied' became obsolete relatively early on in

²⁰See Joseph & Janda (1988) for discussion of the issue of directionality with such changes.

²¹Compare also the situation with morphophonemic voicing in English plurals, discussed above (and see footnote 9), and note the on-going variation in the marking of past participles in English, with older *-(e)n* in some verbs giving way to the wider-spread *-ed* (as in *sewn* / *sewed*, *shown* / *showed*, *proven* / *proved*, etc.).

²²The Spanish example suggests that changes in case-marking systems are not restricted to the distant past, though the failure of *-go* to spread to other pronouns (indeed, it has retreated somewhat from wider use in older stages of the language) or to use with other prepositions argues that it is not really a case-marking device. Similarly, the innovative use in certain varieties of written English of *inwhich*, as in *Shopping is a task inwhich one should enjoy*, has led some researchers, e.g. Smith 1981, and Riley & Parker 1986, to analyze it as a new case form of the relative pronoun, though Montgomery & Bailey 1991, in an extensive study of the use of the form, argue persuasively against that interpretation. Nonetheless, such examples provide the opportunity to witness the fate of case-like forms that occur in a restricted domain of the grammar, and thus provide some insights into the general processes by which such forms arise and take hold in a language.

the Post-Classical period; compare the merging of perfect and simple past tense for some speakers of Modern English, for whom *Did you eat yet?* is as acceptable as *Have you eaten yet?*. Actually, though, the reconstitution (and thus addition) of the category "perfect" occurred in the Medieval Greek period through the development of a periphrastic (analytic) perfect tense with 'have' as an auxiliary verb out of an earlier 'have' future/conditional tense.²³

In the case of the Greek perfect, the Medieval innovation led to what was a new category, for there had been a period of several centuries in Post-Classical times when there was no distinct perfect tense. In some instances, though, it not so much the creation of a new category but rather the renewal of the category through new morphological expression. The future in Greek provides a good example, for throughout its history, Greek has had a distinct future tense, contrasting formally and functionally with a present tense and a past tense, but the expression of the future has been quite different at different stages: the synthetic, suffixal, monolectic future in Ancient Greek (e.g. *grápsō* 'I will write') gave way in Post-Classical times to a variety of periphrastic futures with infinitives plus auxiliary verbs, first with 'have', later with 'want' (e.g. *thélō grápsēin*, literally "I-want to-write"), in which the parts maintained some independence (e.g. they could be separated by adverbs or inverted), but which in turn have ultimately yielded a new synthetic, monolectic future formed with a bound inseparable prefixed marker (in Standard Modern Greek, *tha*, as in *tha yrápsō* 'I will write').²⁴

There can be change as well in the content of a category, which, while in a sense a semantic shift, nonetheless can have morphological consequences, in that the category comes to be realized on elements not originally in its domain. For instance, the Slavic languages have developed a subcategory of "animacy" within the set of nominal gender distinctions, marked formally by the use of genitive forms where accusatives occur for inanimates; in early stages of Slavic (as represented, for example, by the earliest layer of Old Church Slavonic), only certain types of male humans (e.g. adults or freemen as opposed to children or slaves) participated in such "animacy" marking, while later on, a wider range of nouns came to belong to this subcategory (e.g., in Russian, nouns for females show the animate declensional characteristic in the plural, and in Serbo-Croatian, an animal noun such as *lava* 'lion' follows the animate pattern).²⁵

Similar to change in the content of a category is the possibility of change in function/value of a morpheme: morphology involves the pairing of form with meaning, so it is

²³Most likely, the path of development was through the conditional tense (past tense of the future) shifting first to a pluperfect (compare the fluctuation in Modern English between a pluperfect form and what is formally a past tense of the future utilizing the modal *would* in *if*-clauses, e.g. *If I had only known = If I would have known*), from which a present perfect, and other perfect formations could have developed. See Joseph (1983:62-64; 1995), for some discussion.

²⁴The exact path from *thélō grápsēin* to *tha yrápsō* is a bit convoluted and indirect; see Joseph (1983:64-67; 1990:Ch. 5) for discussion and further details. The only material that can intervene between *tha* and the verb in Modern Greek is other bound elements, in particular the weak object pronouns.

²⁵Even in Old Church Slavonic, there was some variability in category membership, and nouns for 'slave', 'child', various animals, etc. showed some fluctuation between animate and nonanimate inflection; see Lunt (1974: 46), and Meillet (1897) for some discussion. The descriptions in Comrie & Corbett (1993) provide a useful overview of the realization of animacy throughout the various Slavic languages. Thomason & Kaufman (1988: 249-250) suggest that this category may have developed through a Uralic substratum shifting to Slavic.

appropriate to note here as well instances in which there is change in the function of a morpheme, even though that might also be better treated under the rubric of semantic change. For instance, the development of the German plural marker *-er* discussed above clearly involves a reassignment of the function of the suffix **-iz-* (\rightarrow *-er*) from being a derivational suffix serving to create a particular stem-class of nouns to being an inflectional marker of plural number. So also, the polarization of *was/were* allomorphy in some dialects of English to correlate with a positive/negative distinction, so that *were* is more likely to occur with *-n't* than is *was* (Trudgill 1990, Estes 1993, Schilling-Estes & Wolfram 1994), shows a reinterpretation of allomorphy that once signaled singular versus plural (or indicative versus subjunctive).

The changes illustrated so far have been fairly concrete, in that they concern the phonological realization of morphological categories or the categories themselves (which need some realization). There can also be change of a more abstract type, and a particularly fruitful area to examine is the matter of lexical relations. The components of grammar concerned with morphology, whether a separate morphological component or the lexicon, reflect the relationships that exist among forms of a language, whether through lexical "linking" rules, lexical redundancy rules, or common underlying forms. Significant changes can occur in the salience of certain relations, to the point where forms that were clearly related at an earlier stage of the language are just as clearly perceived by speakers at a later stage not to be related. Etymological dictionaries²⁶ provide dozens of examples involving separate lexical items that have lost any trace of a connection except for those speakers who have secondarily acquired knowledge of the relationship, e.g. *two* and *twine*, originally a 'double thread' (both from the earlier root for 'two'), or *yellow* and *gall* (both originally from a root for 'shine', but with different original vocalism and different suffixal formations)²⁷, to name just a few such sets from English. This situation frequently arises with words that are transparent compounds at one stage but lose their obvious composition. For instance, the modern English word *sheriff* derives from an Old English compound *scīrgerēfa*, literally the "reeve" (*gerēfa*) of the "shire" (*scīr*), but is not obviously connected in any way with Modern English *shire* or *reeve*; nor is *lord* plausibly connected synchronically with *loaf* or *ward*, the modern continuations of its Old English components (*hlāford*, literally "bread-guardian", from *hlāf* 'bread' plus *weard* 'guardian'). In these cases, both sound changes, which can obscure the once-obvious relationship, as with *l(-ord)* and *loaf*, and semantic changes, as with *(l-)ord* and *ward* (the latter no longer meaning 'guardian'), can play a role in separating once-synchronically related lexical items.²⁸ And, borderline cases provide some difficulties of analysis; for instance, are the semantically still-compatible words *two* and *twelve* to be synchronically related in Modern English, and if so, does *two* derive from a form with an underlying cluster /*tw-/*? To a certain degree, the answers to such questions will depend on meta-theoretical concerns, such as a decision on the degree of abstractness to be allowed in morphophonological analyses (on which, see below).

²⁶For English, the *American Heritage Dictionary of the English Language* (3rd edition, 1992), with its "Indo-European Roots Appendix" by Calvert Watkins, is an excellent example of such a resource.

²⁷*yellow* is from Old English *geolu*, from Proto-Germanic *gelwaz; *gall* is from Old English *gealla*, from Proto-Germanic *gallōn-.

²⁸Note also that words that are etymologically unrelated can come to be perceived by speakers at a later stage as related, perhaps even merged into different meanings of the same word. For instance, the body-part *ear* and *ear* as a designation of a piece of corn, are etymologically distinct (the former from Proto-Indo-European *ous- 'ear', the latter from *ak- 'sharp'), but are felt by many speakers to be different meanings of one polysemous lexical item.

In the face of such examples of change, it is equally important to reflect on what does not or cannot change in the morphology. To the extent that there are well-established principles and constructs that are taken to be part of the basic theoretical framework for morphology, e.g. Lexical Integrity, Morphology-Free Syntax, disjunctive ordering for competing morphological rules, or the like, presumably these will not change; they are the theoretical building blocks of any account of the morphological component, and thus cannot change diachronically (though they can of course be altered by linguists in their descriptions/accounts if synchronic or diachronic facts make it clear, for instance, that syntax is not morphology-free, or the like).

Among these theoretical building blocks are some that have a significant impact on diachronic accounts of morphology, in particular those that allow for the determination of the borderlines between components of grammar. That is, it is widely recognized that there is interaction at least between morphology and phonology (witness the term "morphophonology", and the possibility of phonological constraints on morphological rules) and between morphology and syntax (witness the term "morphosyntax"). Thus it becomes appropriate to ask how to tell when some phenomenon crosses the border from "pure" phonology into "morphology", or vice-versa, or from "pure" syntax into "morphology"; although there is a purely synchronic question here of how to characterize a given phenomenon in a given language for a given period of time, the matter of crossing component boundaries is also a diachronic issue. If a once-phonological phenomenon comes to be completely morphologically conditioned, and is considered to be part of the morphological component and not the phonological component, then there has been a change in the grammar of the language with regard to that phenomenon; the surface realization of the forms may not change, but the grammatical apparatus underlying and producing or licensing those surface forms has changed. Thus when the vowel-fronting induced by a following high vowel (so-called "umlaut") in early German came in later stages of the language, when the phonetic motivation for the fronting was obscured or absent on the surface, to be an effect associated with the addition of certain suffixes (e.g. the diminutive *-chen*, the noun plural *-e*, etc.) or with the expression of certain categories (e.g. plural of certain nouns which take no overt suffix, such as *Bruder* 'brother', with plural *Brüder*), one interpretation is that the umlauting process is no longer phonological in nature but rather is a morphological process invoked by certain morphological categories.²⁹ Similarly, at a stage in which the expression of allatives in (pre-)Lithuanian was accomplished by a noun plus a postposition, syntactic rules that license postpositional phrases were responsible for the surface forms; when the noun fused with the postpositional element to such an extent that a virtual new case-marker was created, the responsibility for the ultimate expression of the allative would have moved out of the realm of syntax and into the morphological component.

These examples and the relevance of theoretical decisions separating components of grammar point to the need to recognize the impact that the theory of grammar one adopts has on diachronic analyses. For example, permitting a degree of abstractness in phonological analyses can often allow for a description that is purely phonological rather than morphological in nature. Umlaut in German, for instance, could still be considered to be purely phonological, if each suffix or category now associated with umlaut of a stem were represented underlyingly with a high front vowel to act as the triggering segment; deleting that segment before it could surface would have to be considered to be allowable abstraction.

²⁹See Janda (1982, 1983) for a thorough discussion of the relevant facts supporting this analysis of German umlaut. The productivity of umlaut does not in itself argue for it being phonological still; in that sense, the German situation is now similar in nature, though not in scope, to the very limited umlaut effects present still in English, e.g. in a few irregular plurals (*man/men, foot/feet*, etc.) and verbal derivatives (*drink/drench*, etc.).

Similarly, the palatalizations of stem-final velars in various Slavic languages that accompany the attachment of certain suffixes (e.g. Russian adjectival *-nyj*, as in *vostoč-nyj* 'eastern' from the noun *vostok* '(the) east') were once triggered by a suffix-initial short high front vowel (the "front jer") that ultimately was lost in most positions in all the languages; thus a synchronic purely phonological analysis could be constructed simply by positing an abstract front jer that triggers the palatalization and is then deleted.³⁰

2. Where does morphology come from?

The examples in section 1 show that the primary source of morphology is material that is already present in the language, through the mediation of processes of resegmentation and reinterpretation applied in a variety of ways, as well as by other processes of change, e.g. sound changes, that lead to grammaticalization. In addition, morphology may enter a language through various forms of language contact.

Thus examples of blending or contamination involve preexisting material, as in the case of Greek IDUAL.MEDIOPASSIVE ending (see note 6), where a "crossing" of the 1PL.MEDIOPASSIVE ending *-metha* with the 2DUAL.MEDIOPASSIVE ending *-stho*n yielded *-methon*. In a parallel fashion, when a sequence of elements is resegmented, i.e. given a different "parsing" by speakers from what it previously or originally had, material already in the language is given a new life. The English *-ness* suffix, for instance, derives from a resegmentation of a Germanic abstract noun suffix **-assu-* attached to *n*-stem adjectives, with subsequent spread to different stem-types; thus **ebn-assu-* 'equality' (stem: **ebn-* 'even, equal') was treated as if it were **eb-nassu-*, and from there **-nassu-* could spread, as in Old English *ehtness* 'persecution' (from the verb *eht-an* 'to pursue') or *gōdness* 'goodness' (from the adjective *gōd*). The extreme productivity of this new suffix in Modern English, being able to be added to virtually any new adjective (e.g. *gauche-ness*, *uptight-ness*, etc.) shows how far beyond its original locus a form can go, and also how the productivity of a morpheme can change, since *-ness* originally had a more limited use.

Other types of reanalysis similarly draw on material present at one stage of a language in one form and transform it at a later stage. In many cases of desyntacticization, for instance, where once-syntactic phrases are reinterpreted as word-level units with affixes that derive from original free words or clitics, as in the Oscan locative or Lithuanian allative discussed above, the same segmental material is involved, but with a different grammatical status. Sometimes, though, such reanalyses are accompanied (or even triggered) by phonological reductions, so that the result is just added segmental material with no clear morphological value; the *-t* of Old English *wit* 'we two', for instance, comes from a phonologically regular reduction of the stem for 'two' in an unstressed position, that is from **we-dwo*, and similar cases involving old compounds, e.g. *sheriff* and *lord*, were noted above. Moreover, when sound changes obscure the conditioning factors for a phonologically-induced effect, and a new morphological process arises, as with umlaut in German, again what has occurred is the reanalysis of already existing material, in this case the fronting of a stem vowel that accompanies the addition of an affix; the new process is

³⁰Thus there is an important interaction with sound change to note here, for sound change can obscure or remove the conditioning elements for a phonological process, thereby rendering the process opaque from a phonological standpoint and making it more amenable to a morphologically-based analysis. Recall also that sound change can play a role in the reduction of compounds to monomorphemic words and of phrasal units, such as noun plus postposition, to monolexemic expressions.

then available to spread into new contexts, having been freed from a connection to a particular phonological trigger.

Sometimes semantic shifts are involved in such reanalyses. The well-known example of the new suffix *-gate* in English is a case in point. This suffix originated from the phrase *Watergate affair* (or *scandal* or the like), referring to the events in the aftermath of a burglary at the Watergate apartment complex that brought down the Nixon administration in the early 1970s, through a truncation of the phrase to *Watergate* (e.g. *Nixon resigned because of Watergate*) and a reanalysis in which the *-gate* part was treated as a suffix and not the compound-member it originally was in the place-name *Watergate*. It then spread, giving coinages such as *Irangate* (for a scandal in the 1980s involving selling arms to Iran), *Goobergate* (for a scandal alleged in 1979 to have involved then-President Carter's peanut warehouse), and numerous others.³¹ What is especially interesting about this reanalysis is that in the process of *-gate* becoming a suffix, there was a shift in its meaning, so that in *X-gate*, the suffix *-gate* (but not the free word *gate*) itself came to mean 'a scandal involving X', an abbreviation, as it were, for 'a scandal involving X reminiscent of the Watergate scandal'.

Other processes similar to these that create pieces of words produce as well new lexical items and thus contribute to the morphological component, to the extent that it includes the lexicon. Without going into great detail, one can note active processes of word-formation such as compounding, acronymic coinage (e.g. *cpu* (pronounced [sɪpiju]) for *central processing unit*, *ram* ([ræm]) for *random-access memory*, *rom* ([rɒm]) for *read-only memory*, etc.), clipping (e.g. *dis* from (*show*) *disrespect*, *rad* from *radical*, *prep* from *prepare* and from *preparatory*, *vet* from *veteran* and from *veterinarian*, etc.), lexical blends (e.g. *brunch* from *breakfast* crossed with *lunch*, etc.), phrasal truncations (such as the source of the word *street* via a truncation, with a semantic shift, of Latin *via strāta* 'road (that has been) paved' to simply *strāta*), and so on. It is worth noting here that whereas virtually any piece of a word can be "elevated" to status as a free word via clipping, even suffixes, inflectional morphemes seem to be resistant to such an "upgrading"; thus although *ism* as a free word meaning 'distinctive doctrine, system, or theory' (*AHD* 1992, s.v.) has been extracted out of *communism*, *socialism*, etc., instances in which suffixes like *-ed* or *-s* become words for 'past' or 'many' or the like appear not to exist.

One final language-internal path for the development of morphology involves instances in which the conditions for an analysis motivating a sequence of sounds as a morpheme arise only somewhat accidentally. In particular, if a situation occurs in which speakers can recognize a relation among words, then whatever shared material there is among these words can be elevated to morphemic status. This process is especially evident with phonesthemes, material that shows vague associative meanings that are often sensory based, such as the initial sequence *gl-* in English for 'brightly visible', as in *gleam*, *glitter*, *glisten*, *glow*, and the like. Some linguists are hesitant to call these elements morphemes, and terms like quasi-morpheme, sub-morphemic unit, and others have been used on occasion, even though by most definitions, they fulfill the criteria for being full morphemes. Leaving aside the synchronic issue they pose for analysis, it is clear that they can come to have some systematic status in a grammar, for they can spread and be exploited in new words (e.g. *glitzy*, which, whether based on German *glitzern* 'to glitter' or a blend involving *ritzy*, nonetheless fits into the group of other "bright" *gl-* words). A good example of this process is afforded by the accumulation of words in English that end in *-ag* (earlier [-æɡ], now [-æŋ]) and have a general meaning referring to 'slow, tired, or tedious action',

³¹Many such *-gate* forms are documented in notes in *American Speech*; see Joseph 1992 for references.

specifically *drag* 'lag behind', *fag* 'grow weary', *flag* 'droop', and *lag* 'straggle', all attested in Middle English but of various sources (some Scandinavian borrowings, some inherited from earlier stages of English); once there were four words with a similar meaning and a similar form had entered the language by the 13th or so century, an analysis was possible of this *-ag* as a (sub-)morphemic element. That it had some reality as such a unit is shown by the fact that these words "attracted" a semantically related word with a different form into their "orbit" with a concomitant change in its form; *sag* 'sink, droop' in an early form (16th century) ended in *-k*, yet a perceived association with *drag/fag/flag/lag* and the availability of *-ag* as a marker of that group brought it more in line with the other members, giving ultimately *sag*.

The example of *-gate* above also shows language contact as a source of new morphology in a language, for it has spread as a borrowed derivational suffix into languages other than English; Schuhmacher 1989 has noted its presence in German, Kontra 1992 gives several instances of *-gate* from Hungarian, and Joseph 1992 provides Greek and Serbo-Croatian examples. Numerous examples of borrowed derivational morphology are to be found in the Latinate vocabulary in English, but it should be noted also that inflectional morphology can be borrowed. Various foreign plurals in English, such as *criteria*, *schemata*, *alumnae*, etc., illustrate this point, as do the occurrence of Turkish plural endings in some (now often obsolete) words in Albanian of Turkish origin, e.g. *at-llarë* 'fathers', *bej-lerë* 'landlords' etc. (Newmark et al. 1982:143), and the verb paradigms in the Aleut dialect spoken on the island of Mednyj, which show Russian person/number endings added onto native stems, e.g. *uŋuč-i-ju* 'I sit' / *uŋuč-i-it* '(s)he sits', etc. (Thomason & Kaufman 1988:233-238).³² Although it is widely believed that inflectional morphology is particularly resistant to borrowing and to being affected by language contact, Thomason & Kaufman 1988 have shown that what is crucial is the social context in which the contact and borrowing occurs. Thus the intense contact and the degree of bilingualism needed to effect contact-induced change involving inflectional morphology simply happen not to arise very often, so that any rarity of such change is not a linguistic question *per se*. Moreover, the spread of derivational morphology across languages may actually take place through the spread of whole words, which are then "parsed" in the borrowing language; the *-gate* suffix in Greek, for instance, occurred first in labels for scandals that followed the English names directly (e.g. "Irangate") before being used for Greek-internal scandals.

3. What triggers change in the morphology?

Historical linguists tend to divide causes of change into those internal to the linguistic system itself and those that are external, i.e. due to language contact. The discussion in section 2 shows that language contact indeed is one potential cause of morphological change, and under the right social conditions for the contact, virtually any morphological element (inflectional, derivational, bound, free, whatever) can be transferred from one language to another. Examining contact-induced morphological change then becomes more a matter — an important one to be sure — of cataloguing the changes and determining the

³²Of course, some of these English forms are susceptible, seemingly more so than native plurals, to re-analysis as singular; *criteria* is quite frequently used as a singular, and a plural *criteriae* can be heard as well. Similarly, the Albanian plurals in *-llarë/-lerë* show the native plural suffix *-ë* added to the Turkish *-lar/ler* ending, somewhat parallel to forms like *criteriae*.

sociolinguistic milieu in which the contact occurs.³³ There is far more to say, however, about internal forces triggering change in the morphology.

From a consideration of the examples above, it emerges that much of morphological change involves "analogy", understood in a broad sense to take in any change due to the influence of one form over another.³⁴ This process is most evident in blending or contamination, where there is mutual influence, with a part of one form and a part of another combining, but it extends to other types of morphological change as well.

For instance, the spread of *-t-* described above in the stem of Greek neuter nouns in *-ma* involved the influence of the genitive singular forms, the original locus of the *-t-*, over other forms within the paradigm. Such paradigm-internal analogy, often referred to as "levelling", is quite a common phenomenon. An interesting example, to be reexamined below from a different perspective, involves the reintroduction of *-w-* into the nominative of the adjective for 'small' in Latin: in early Latin, the adjective had nominative singular *parw-os* and genitive *parw-t*, and paradigmatic allomorphy *par-os* versus *parw-t* resulted when a sound change eliminated *-w-* before a round vowel; paradigm-internal analogical pressures led to the restoration of the *-w-*, giving ultimately the Classical Latin forms *parvus* / *parvī*.

Analogical influence among forms is not restricted to those that are paradigmatically related. Two elements that mark the same category but with different selectional properties can exert analogical pressures, leading to the spread of one at the expense of another. Examples of such analogies include cases across form-classes where the elements involved are different morphemes, as with the spread of the *-s* plural in English at the expense of the *-(e)n* plural, discussed in section 1, as well as cases where one conditioned allomorphic variant extends its domain over another, thereby destroying the once-conditioned alternation, as with the spread of the Greek 2SG.MEDIOPASSIVE ending *-sai*, also discussed above.

Similarly, in cases of "folk etymology", speakers reshape a word based on other forms that provide what they see as a semantically (somewhat) motivated "parsing" for it; for example *tofu* for some speakers is [tofud] as if a compound with *food*, and *crayfish*, first borrowed from French in the 14th century as *crevice*, was remade as if containing the lexeme *fish*. In such cases, which are quite common with borrowings or words that are unfamiliar for reasons such as obsolescence, there is influence from one form being brought to bear on the shape of another. More generally, many cases of reanalysis/reinterpretation involve some analogical pressures, especially when the reanalysis is induced by models that exist elsewhere in the language; for instance, when Middle English *pease*, a singular noun meaning 'pea', was reanalyzed as a plural, allowing for the creation (by a process known as "backformation") of a singular *pea*, the influence of other plurals of the shape [...V-z] played a role.

Thus there is a cognitive dimension to (certain types of) morphological change, in the sense that it often involves speakers actively making connections among linguistic forms

³³The distinction drawn by Thomason & Kaufman 1988 between borrowing and language shift is a crucial one, with the latter situation being the contact vehicle for some of the more "exotic" morphological changes. Their discussion is perhaps the most complete enumeration of the wide range of possible contact-induced changes, including those affecting the morphology. See also footnote 23 above concerning a language-shift source for the introduction of the new animacy subcategory in Slavic.

³⁴See Anttila 1977 and Anttila & Brewer 1977 for basic discussion and bibliography on analogy in language change.

and actively reshaping their mental representations of forms.³⁵ Indeed, analogy as a general mode of thinking and reasoning has long been treated within the field of psychology, and work by Esper³⁶ was an early attempt to study the psychological basis for analogical change in language.³⁷ More recently, analogical change has been viewed from the perspective of a theory of signs; Anttila (1972), for instance, has argued that the semiotic principle of "one form to one meaning" drives most of analogical change in that levellings, form-class analogies, folk etymology, and the like all create a better fit between form and meaning, while proponents of Natural Morphology similarly work with the importance of degrees of iconicity in the form-meaning relationship and, for example, evaluate changes in the marking of inflectional categories or derivational relationships in terms of how they lead to a better fit with universal iconic principles.³⁸ Even the process of grammaticalization has been given a cognitive interpretation; Heine, Claudi, & Hünnemeyer (1991: 150), for instance, have argued that "underlying grammaticalization there is a specific cognitive principle called the 'principle of the exploitation of old means for novel functions' by Werner and Kaplan (1963:403)" and they note that in many cases, grammaticalization involves metaphorical extension from one cognitive domain, e.g. spatial relations, to another, e.g. temporal relations (as with *behind* in English).³⁹

Moving away from these more cognitive, functional, and/or mentalistic views of what causes morphological change, one can take the generative approach to analogy in which it is nothing more than changes in the rule system that generates a given paradigm. The Latin case mentioned above whereby a paradigm of *parw-os /parw-ī*, yielded *par-os /parw-ī* by sound change and finally *parvus /parvī* by paradigm levelling could be seen as the addition of a rule of *w* → \emptyset before front vowels (the sound change) operating on an underlying form for the nominative with the *-w-*, and then the loss of that rule giving the underlying stem-final *-w-* a chance to surface once again. What is left unexplained in such an account is why the rule would be lost at all; early generative accounts (e.g. King 1969, Kiparsky 1968) simply gave a higher value to a grammar with fewer rules or features in the rules (but then why would a rule be added in the first place?), or unnatural rule orderings, whereas later accounts (especially Kiparsky 1971) gave higher value to grammars that generated

³⁵Analogy can also provide direct evidence for the existence of the tight relations among members of clusters of forms that allow for an inference of a (psychologically) real category. For instance, the fact that *drag/fag/flag/lag* could affect [sæk] and draw it into their "orbit" as *sag* is *prima facie* evidence of the strength of the connections among these four words. Similarly, the dialectal extension of the *-th* nominalizing suffix, which shows limited productivity within the domain of dimension adjectives (cf. *wide/width, deep/depth*, etc.) to *high*, giving [hɑɪθ] (thus with some contamination from *height*) can be seen as evidence of the subcategory within which the suffix is productive.

³⁶See, for example, Esper 1925, but also the posthumous Esper 1973.

³⁷See also the recent work by Skousen in which an explicit and formal definition of analogy is used to create a predictive model of language structure; among the tests for this approach, in Skousen (1989: Ch. 5), is its application to historical drift in the formation of the Finnish past tense.

³⁸Especially the work by Wolfgang Dressler, Willi Mayerthaler, Wolfgang Wurzel, and others; see for instance Dressler et al. 1987, Mayerthaler 1981, Wurzel 1984. See also Shapiro 1990 (with references) where a somewhat different view of the role of semiotics in language change, as applied to morphophonemics, is to be found.

³⁹Of course, not all grammaticalization involves morphological change, except insofar as it affects lexical items. The papers in Traugott & Heine 1991 contain numerous references to the cognitive dimension of grammaticalization; see also Hopper & Traugott 1993 for discussion and references.

paradigm-internal regularity, a condition that tacitly admits that the traditional reliance on the influence of related surface forms had some validity after all. Another type of generative reinterpretation of analogy is that given by Anderson 1988, who, as observed in footnotes 8 and 10, sees "analogies" such as the spread of the English -s plural or the loss of morphophonemic voicing in certain English plurals as being actually changes in the lexically idiosyncratic specifications for the inflectional markings, derivational processes, and the like selected by particular lexical items.

Finally, any discussion of causes must make reference to the fact that as is the case with all types of language change, the spread of morphological innovations is subject to social factors governing the evaluation of an innovation by speakers and its adoption by them. Indeed, if one takes the view that true language change occurs only when an innovation has spread throughout a speech community, then the various processes described here only give a starting point for a morphological innovation, but do not describe ultimate morphological change in the languages in question.⁴⁰ The presence of synchronic variation in some of the changes discussed above, as with the loss of morphophonemic voicing in English plurals, shows how the opportunity can arise for nonlinguistic factors to play a role in promoting or quashing an innovation.

4. Is a general theory of morphological change possible?

Over the years, there have been numerous attempts at developing a general theory of morphological change, and the approaches to the causes of morphological change outlined in the previous section actually represent some such attempts. To a greater or lesser extent, there have been successes in this regard. For instance, the recognition of a cognitive dimension to analogy and to grammaticalization has been significant, as has the corresponding understanding of the role of iconicity. The generative paradigm has been embraced by many, but a few further comments about it are in order.

Most important, as noted above, an account of analogical change in paradigms that is based on changes in the rules by which the paradigms are generated does not extend well to analogical changes that cannot involve any rules, such as blends or contamination. A development such as Middle English *femelle* (a loan word from French) becoming *female* by contamination with *male* does not involve any generative rules, yet it still took place and one would be hard-pressed to account for the change in the vocalism of this word without some reference to pressure from the semantically related *male*. Similarly, the change of the nominative singular of the uniquely inflected word for 'month' in the Elean dialect of Ancient Greek, giving *meús* (with genitive *mēn-ós*, versus, e.g., Attic nominative *meís*), based on the uniquely inflected word for the god Zeus (nominative *Zeús*, genitive *Zēn-ós*) could not involve any generative phonological rules since both words were the only members of their respective declensional classes and thus probably listed in the lexicon rather than rule-governed in terms of their inflection.⁴¹ On the other hand, the semiotic and

⁴⁰This view has long been associated with William Labov and is expressed most recently in Labov (1994: 45): "In line with the general approach to language as a property of the speech community, I would prefer to avoid a focus on the individual, since the language has not in effect changed unless the change is accepted as part of the language by other speakers".

⁴¹One could say of course that there has been a change in the morphological rules that introduce the stem variants for 'month', but that still brings one no closer to understanding why the change occurred. Once 'Zeus' and 'month' share the same patterns of alternation, then a generalization over these two forms is

cognitive views of analogy, for instance invoking a one-form-to-one-meaning principle, can provide a motivation not only for the putative cases of analogy as rule-change but also for those that could not involve rule change.⁴² Moreover, cases of bi-directional levelling, as presented by Tiersma 1978 with data from Frisian, in which some paradigms involving a particular phonological rule are "levelled" as if the rule had been lost, while others involving the same rule are "levelled" as if the rule had been generalized, make it difficult to give any predictive value to a rule-based approach to analogy.⁴³ Finally, the recognition of paradigm uniformity as a part of the evaluation metric in Kiparsky 1971 is tantamount to recognizing analogy in its traditional sense. As Anttila (1972: 129, 131) puts it: "What rule changes always describe, then, is the before-after relationship. They give a mechanism for description, not a historical explanation [...] Rule change is not a primary change mechanism, but an effect".

This is not to say, however, that traditional analogy is not without some problems. As has frequently been pointed out, it often seems unconstrained, and there is an element of unpredictability with it: When will analogy occur? What direction will levelling take? Which forms will serve as models? etc. In part to address this uncertainty about the workings of analogy, some scholars have attempted to formulate a set of general tendencies or regularities governing analogy. The two most widely discussed schemes are those of Kurylowicz (1945-9) and Mańczak (1958).⁴⁴ A full discussion of these proposals is beyond the scope of this paper, but it is generally held that Kurylowicz's "laws" are, as Collinge (1985: 252) citing Anttila (1977: 76-80) puts it, more "qualitative and formal" in nature whereas Mańczak's tendencies are more "quantitative and probabilistic".⁴⁵ It can be noted also that some of their specific proposals complement one another, some are contradictory, some are tautologous and thus of little value, but some, e.g. Mańczak's second tendency ("root alternation is more often abolished than introduced") and Kurylowicz's first "law" ("a bipartite marker tends to replace an isofunctional morpheme consisting of only one of these elements") are valuable tools in analyzing analogical changes, as they represent reflections of tensions present in language in general, respectively the need to have redundancy for clarity and the desire to eliminate unnecessary or unmotivated redundancy.⁴⁶ Moreover, Kurylowicz's fourth "law" has, in the estimation of Hock (1991: 230), proven to be "a very reliable guide to historical linguistic research". This "law", which states that an

possible, allowing for some simplification in the grammar. However, the change cannot have occurred just to simplify the morphological rules for 'Zeus' somewhat by giving them wider applicability, since a greater simplification would have arisen had the stem-alternation for this noun been eliminated altogether (as it was in some dialects that innovated a nominative *Zēn*).

⁴²Thus *female* makes more "sense", and thus is a better fit between form and meaning, when formally paired with its antonym *male*; similarly, providing a "partner" for the unique stem-alternations of 'Zeus' makes the *Zeus- / Zēn-* alternation less irregular, and thus more motivated and easier to deal with from a cognitive standpoint.

⁴³Similarly, note forms such as *dwarves* in English, mentioned above in footnote 10, that run counter to the general levelling out of stem differences due to voicing of fricatives in the plural.

⁴⁴See Winters 1995 for an English translation, with some commentary of this important oft-cited yet generally little-read paper.

⁴⁵See Vincent 1974, Collinge (1985: 249-253), Hock (1991: Chapter 10), and Winters 1995 for more detailed discussion and comparison of the two schemes.

⁴⁶The statements of these principles and their comparison are taken from Hock (1991: Chapter 10).

innovative form takes on the primary function and the older form it replaces, if it remains at all, does so only in a secondary function, can be exemplified by the oft-cited case of English *brethren*, originally a plural of the kinship term *brother*, but now relegated to a restricted function in the meaning "fellow members of a church".⁴⁷

Other general tendencies of morphological change have been proposed and have proven quite useful. For instance, there is the observation by Watkins 1962 that third person forms are the major "pivot" upon which new paradigms are constituted.⁴⁸ However, as with other proposed principles, "Watkins' Law" is also just a tendency; the change of the 3PL past ending in Modern Greek to *-ondustan* discussed in section 1, which shows the effects of pressure from 1PL and 2PL endings on the 3PL, might constitute a counterexample, for instance.

In the end, it must be admitted that much of morphological change involves lexically particular developments, and it is significant that even the spread of analogical changes seems to be tied to particular lexical items; thus unlike sound change, which generally shows regularity in that it applies equally to all candidates for the change that show the necessary phonetic environment, morphological change, especially analogical change, is sporadic in its propagation. Thus, as shown in section 1, even with the vast majority of nouns in English now showing an innovative *-s* plural, a few instances of the older *-(e)n* marker in *oxen*, *children*, *brethren*, and proper names like *Schoonmaker*.

Therefore, it may well be that for morphological change, a general theory, that is, a predictive theory, is not even possible, and all that can be done is the cataloguing of tendencies, which, however valid they may be, do not in any sense constitute inviolable predictions about what types of changes will necessarily occur in a given situation. In that sense, accounts of morphological change are generally retrospective only, looking back over a change that has occurred and attempting to make sense of it.

5. Conclusion

Although morphological change in general shows much that is unpredictable, the examples provided herein give a good overall view of the types of changes that are likely to be encountered in the histories of the languages of the world, the causes underlying these changes, and the ways linguists have gone about explaining the observed changes.

One final observation on the extent of the domain of morphological change is in order. Much of morphological change, as described here, involves changes in lexical items — in their form, in their selectional properties, in their relations to other lexical items, and so on — and this is all the more so if inflectional affixes are listed in the lexicon instead of being introduced by morphological rules. It is generally accepted that at least certain types of sound changes involve lexeme-by-lexeme spread (the cases of so-called lexical diffusion, cf. Wang 1969 but especially Labov 1981, 1994) and it seems that in some instances, at least, the impetus for the spread of a pronunciation into new lexical items is essentially

⁴⁷See Robertson 1975 for an example of the fourth law from Mayan.

⁴⁸See Collinge (1985: 239-240) for discussion and references.

analogical in nature.⁴⁹ Also, there are many so-called irregular sound changes, e.g. metathesis or dissimilation, that apply only sporadically, and thus end up being lexically particular rather than phonologically general. Moreover, at least certain types of changes typically relegated to the study of syntactic change (for instance changes in agreement patterns, grammaticalization, movement from word to clitic to affix, reduction of once-bi-clausal structures to monoclausal, and the like—i.e. much of syntactic change other than word order change) ultimately involves morphology or at least “morphosyntax” in some way.⁵⁰ Thus it is possible to argue that much, perhaps most, of language change has a morphological/morpholexical basis, or at least has some morphological involvement. Such a view would then provide some diachronic justification for the importance of morphology in language in general and thus for a morphological component in the grammars of particular languages.⁵¹

⁴⁹For example, a possible scenario for lexically diffuse spread of a sound change is the following: if lexical item X shows variation in pronunciation between X and X', and item Y has some of the same phonological features as item X, speakers might extend, analogically with X as the model, the variant pronunciation X' to Y, so that Y comes to show variation between Y and Y'. If the competition is ultimately resolved in favor of X' and Y', the sound change would have been generalized.

⁵⁰See for example, DeLancey 1991, regarding such clause reduction in Modern Tibetan (discussed in Hopper & Traugott 1993: 198-201).

⁵¹In Joseph & Janda 1988, the claim is advanced that grammars are “morphocentric”, and the prevalence noted above in section 1 of diachronic movement into morphology (from syntax and from phonology), as opposed to the relative rarity of movement out of morphology, is taken as diachronic evidence for the centrality of morphology. This claim is based on an assumption that facts from diachrony can have relevance to the construction and evaluation of synchronic grammars, and to the extent that it is valid, provides some support for treating such facts as important.

REFERENCES

- AHD = The American Heritage dictionary of the English language. Third Edition. Boston: Houghton Mifflin Company.
- Anderson, Stephen R. 1988. Morphological change. In Frederick J. Newmeyer, ed., *Linguistics: the Cambridge survey*. Volume I. *Linguistic theory: foundations*. 324-362. Cambridge: Cambridge University Press.
- Anttila, Raimo. 1972. *An introduction to historical and comparative linguistics*. New York: MacMillan Publishing Co. (revised and expanded edition published 1988, Amsterdam: John Benjamins Publishing Co.).
- Anttila, Raimo. 1977. *Analogy*. The Hague: Mouton.
- Anttila, Raimo and Warren A. Brewer. 1977. *Analogy: a basic bibliography* (= Amsterdam Studies in the Theory and History of Linguistic Science, Series 5, vol. 1). Amsterdam: John Benjamins Publishing Co.
- Bloomfield, Leonard. 1946. Algonquian. In *Linguistic structures of native America* (= The Viking Fund Publications in Anthropology 6). New York: The Viking Fund [reprinted 1971 by Johnson Reprint Corporation, New York].
- Buck, Charles D. 1928. *A grammar of Oscan and Umbrian*. Boston: Ginn and Co.
- Chantraine, Pierre. 1973. *Morphologie historique du grec* [2nd edition]. Paris: Éditions Klincksieck.
- Collinge, N. E. 1985. *The laws of Indo-European* (= Benjamins Paperbacks 2). Amsterdam: John Benjamins Publishing Co.
- Comrie, Bernard and Greville Corbett, eds. 1993. *The Slavonic languages*. London and New York: Routledge.
- Dai, John. 1990. Historical morphologization of syntactic structures: evidence from derived verbs in Chinese. *Diachronica* 7.1.9-46.
- DeLancey, Scott. 1991. The origins of verb serialization in Modern Tibetan. *Studies in language* 15.1-23.
- Dressler, Wolfgang; Willi Mayerthaler; Oswald Panagl; and Wolfgang U. Wurzel. 1987. *Leitmotifs in natural morphology*. Amsterdam: John Benjamins Publishing Co.
- Esper, Erwin A. 1925. *A technique for the experimental investigation of associative interference in artificial linguistic material* (= Language Monographs, 1). Philadelphia: Linguistic Society of America.
- Esper, Erwin A. 1973. *Analogy and association in linguistics and psychology*. Athens: University of Georgia Press.
- Estes, Natalie. 1993. *Alternative regularization patterns for past-tense be in a semi-isolated eastern coastal community*, paper presented at N.W.A.V.E. 22 (Ottawa).

- Heine, Bernd, Ulrike Claudi, and Friederike Hünemeyer. 1991. From Cognition to grammar—evidence from African languages. In Traugott and Heine 1991, 149-187.
- Hock, Hans Henrich. 1976. Review article on Anttila 1972. *Language* 52.202-220.
- Hock, Hans Henrich. 1991. *Principles of historical linguistics* (second edition, revised and updated). Berlin: Mouton de Gruyter.
- Hopper, Paul J. and Elizabeth Closs Traugott. 1993. *Grammaticalization*. Cambridge: Cambridge University Press.
- Janda, Richard D. 1982. Of formal identity and rule-(un)collapsability: On lost and found generalizations in morphology, WCCFL 1.179-197.
- Janda, Richard D. 1983. Two umlaut-heresies and their claim to orthodoxy. *Coyote Papers (Working Papers in Linguistics, University of Arizona)* 4.59-71.
- Janda, Richard D. 1990. Frequency, markedness, and morphological Change: On Predicting the Spread of Noun-Plural -s in Modern High German—and West Germanic. ESCOL '90 (Proceedings of the Seventh Eastern States Conference on Linguistics), 136-153. Columbus: Department of Linguistics, The Ohio State University.
- Joseph, Brian D. 1983. The synchrony and diachrony of the Balkan infinitive: a study in areal, general, and historical linguistics (= Cambridge studies in linguistics, supplementary volumes, 1). Cambridge: Cambridge University Press.
- Joseph, Brian D. 1990. *Morphology and universals in syntactic change: evidence from Medieval and Modern Greek* (Outstanding Dissertations in Linguistics). New York: Garland Publishing Co. (expanded and updated version of 1978 Harvard University Ph. D. dissertation, printed and distributed by Indiana University Linguistics Club, 1978).
- Joseph, Brian D. 1992. Yet more on -gate words: A Perspective from Greece, *American Speech* 67.2.222-223.
- Joseph, Brian D. 1995. Textual authenticity: evidence from Medieval Greek. To appear in Susan Herring; Pieter van Reenen; and Lene Schoesler, eds., *Textual Parameters in Ancient Languages*. Amsterdam: John Benjamins Publishing Co.
- Joseph, Brian D. and Richard D. Janda. 1988. The how and why of diachronic morphologization and demorphologization. In Michael Hammond and Michael Noonan, eds., *Theoretical morphology. Approaches in modern linguistics*, 193-210. San Diego: Academic Press, Inc.
- King, Robert. 1969. *Historical linguistics and generative grammar*. Englewood Cliffs, NJ: Prentice Hall.
- Kiparsky, Paul. 1968. Linguistic universals and linguistic change. In Emmon Bach and Robert Harms, eds., *Universals in linguistic theory*, 170-202. New York: Holt, Rinehart and Winston, Inc.
- Kiparsky, Paul. 1971. Historical linguistics. In William O. Dingwall, ed., *A survey of linguistic science*, 576-648. College Park: University of Maryland Linguistics Program.

- Kontra, Miklos. 1992. Hungarians turned gateniks in 1990, *American Speech* 67.2.216-222.
- Kurylowicz, Jerzy. 1945-9. La nature des procès dits analogiques. *Acta Linguistica* 5.15-37.
- Labov, William. 1981. Resolving the neogrammarian controversy. *Language* 57.267-308.
- Labov, William. 1994. Principles of linguistic change. Volume 1: Internal factors (= *Language in Society* 20). Oxford: Blackwell.
- Lunt, Horace G. 1974. *Old Church Slavonic Grammar*. The Hague: Mouton.
- Mańczak, Witold. 1958. Tendances générales des changements analogiques. *Lingua* 7:298-325, 387-420.
- Mayerthaler, Willi. 1981. *Morphologische Natürlichkeit*. Wiesbaden: Athenaion (published in translation (by Janice Seidler), 1988, as *Morphological naturalness*). Ann Arbor: Karoma Press).
- Meillet, Antoine. 1897. *Recherches sur l'emploi du génitif-accusatif en vieux slave*. Paris.
- Montgomery, Michael and Guy Bailey. *In which: a new form in written English?*. *American Speech* 66.147-163.
- Nevis, Joel A. 1986. Declitticization and deaffixation in Saame: abessive *taga*. In Brian D. Joseph, ed., *Studies on language change* (Ohio State University Working Papers in Linguistics 34), 1-9. Columbus: The Ohio State University Department of Linguistics.
- Newmark, Leonard; Philip Hubbard; and Peter Prifti. 1982. *Standard Albanian. A reference grammar for students*. Stanford: Stanford University Press.
- Prokosch, E. 1938. *A comparative Germanic grammar*. Baltimore: Linguistic Society of America.
- Riley, Kathryn and Frank Parker. 1986. Anomalous prepositions in relative clauses, *American Speech* 61.291-306.
- Robertson, John. 1975. A syntactic example of Kurylowicz's Fourth Law of Analogy in Mayan. *International Journal of American Linguistics* 41.140-147.
- Schilling-Estes, Natalie and Walter Wolfram. 1994. Convergent explanation and alternative regularization patterns: *were/weren't* leveling in a vernacular English variety. Paper presented at the annual meeting of the Linguistic Society of America, Boston (January, 1994).
- Schuhmacher, W. W. 1989. More on *-gate*. *American Speech* 64.380.
- Shapiro, Michael. 1990. On a universal criterion of rule coherence. In Wolfgang U. Dressler; Hans C. Luschützky; Oskar E. Pfeiffer; and John R. Rennison, eds., *Contemporary morphology* (Trends in Linguistics. Studies and Monographs 49), 25-34. Berlin: Mouton de Gruyter.

- Skousen, Royal. 1989. *Analogical modeling of language*. Dordrecht: Kluwer Academic Publishers.
- Smith, Jo R. 1981. *Inwhich: A New Case Form?* *American Speech* 56.310-311.
- Stang, Christian. 1966. *Vergleichende Grammatik der baltischen Sprachen*. Oslo: Universitetsforlaget.
- Thomason, Sarah G. and Terrence Kaufman. 1988. *Language contact, creolization, and genetic linguistics*. Berkeley: University of California Press.
- Thurneysen, Rudolf. 1970. *A grammar of Old Irish* (translated from the German by D. A. Binchy and Osborn Bergin). Dublin: The Dublin Institute for Advanced Studies.
- Tiersma, Peter. 1978. Bidirectional leveling as evidence for relational rules. *Lingua* 45.65-77.
- Traugott, Elizabeth Closs and Bernd Heine, eds. 1991. *Approaches to grammaticalization*. Volume 1: Focus on theoretical and methodological issues. Volume 2: Focus on types of grammatical markers (= *Typological Studies in Language* 19.1-2). Amsterdam: John Benjamins Publishing Co.
- Trudgill, Peter. 1990. *The dialects of England*. Cambridge: Basil Blackwell.
- Vincent, Nigel. 1974. Analogy reconsidered. In J. M. Anderson and C. Jones, eds., *Historical linguistics (Proceedings of the First International Conference on Historical Linguistics)*, Vol. 2, 427-445. Amsterdam: North Holland.
- Wang, William S.-Y. 1969. Competing changes as a cause of residue, *Language* 45.9-25.
- Watkins, Calvert W. 1962. *Indo-European Origins of the Celtic Verb*. Dublin: The Dublin Institute for Advanced Studies.
- Werner, Heinz and Kaplan, Bernard. 1963. *Symbol formation. An organismic-developmental approach to language and the expression of thought*. New York: Wiley and Sons.
- Winters, Margaret. 1995. Jerzy Kurylowicz: the so-called laws of analogy. *Translated and Introduced*. *Diachronica* 12.1.
- Wurzel, Wolfgang. 1984. *Flexionsmorphologie und Natürlichkeit. Ein Beitrag zur morphologischen Theoriebildung (Studia Grammatica 21)*. Berlin: Akademie Verlag (published in translation as *Inflectional morphology and naturalness*; Dordrecht: Foris).