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:	marks length; thus [a:] is 'long a'
~	'alternates with'
≠	'contrasts with'
#	word boundary
ø	zero morph
→	'is rewritten as' (that is to say 'becomes' in synchronic description)
>	'becomes' in historical linguistics
<	'comes from' in historical linguistics
*	marks a reconstructed earlier form
**	marks a non-attested ungrammatical form in synchronic description
C	any consonant
V	any vowel
S	sentence
NP	noun phrase
VP	verb phrase
PrepP	prepositional phrase
Pron	pronoun
Dem	demonstrative
Aux	auxiliary
Q	question
WH	marks the constituent which is questioned

PREFACE

Although language change has now been studied systematically for a period of one hundred years and somewhat less systematically for a good deal longer than that, there is still a considerable amount of disagreement about its nature and motivation. I have for this reason made no attempt at presenting a theoretically unified account but have rather thought it more useful to describe in chronological sequence the three major models that have been proposed in order to account for the phenomena of language change, that is to say the neogrammarian, the structuralist, and the transformational-generative models. It is my hope that this approach, by making explicit the major points of difference which separate these three schools of thought and allowing the reader to assess their respective merits and weaknesses, may perhaps go some small way towards closing the gap which has arisen between traditional comparative philology and modern theoretical linguistics.

I owe a lasting debt of gratitude to my late teacher Hans Krahe who first introduced me to the rigours of neogrammarian methodology. I am equally indebted to both colleagues and students at the School of Oriental and African Studies for exposing me to the no less rigorous methods of structuralism and transformational grammar and for giving me the opportunity of discussing problems of linguistic comparison outside the Indo-European field. R. H. Robins and Eugénie Henderson in particular were kind enough to read through an earlier version of Part I and to make valuable suggestions. I am also most grateful to W. S. Allen for his extremely helpful criticism and comment on the manuscript as a whole while it was still in draft. And lastly, the script would never have reached its final form without my husband's untiring encouragement and readiness to discuss the problems both of historical linguistics and of English grammar.

London, March 1977 Th.B.

Introduction

Historical linguistics seeks to investigate and describe the way in which languages change or maintain their structure during the course of time; its domain therefore is language in its *diachronic* aspect. Descriptive linguistics on the other hand totally disregards time as a relevant factor in its investigations and attributes to the data a uniform status of simultaneity; its concern is therefore language in its *synchronic* aspect. It will thus be seen that it is not simply the greater or lesser extension in time of the data being investigated which constitutes the fundamental difference between synchronic and diachronic analysis, but rather the linguist's attitude towards the time dimension itself.[1]

Justification for the claim to independent status of synchronic description derives essentially from the observation that the speakers for whom a particular language serves as a means of communication are in general quite unaware of its historical dimension. If, then, the linguist is to create a model of the code which the members of a speech

[1] De Saussure is usually credited with having been the first to make explicit this distinction in his *Cours*, published posthumously in 1916 (de Saussure 1964: 114ff.). He saw the history of a language as a succession of synchronic states, each a complete system *où tout se tient* and therefore definable only in terms of the relationships existing between its various opposing elements. Change on the other hand he saw as applying not directly to the system as a whole but only to individual elements of it, and this in a completely unmotivated and fortuitous fashion. As a result, although each individual change will bring about a new synchronic system capable of description in structuralist terms, there is no such meaningful relationship between successive language states and language change is therefore not amenable to description *in terms of the systems*. De Saussure's position with regard to language change was challenged at the First International Congress of Linguists in 1928 when, in a resolution put forward by among others Trubetzkoy and Jakobson, it was claimed that the diachronic aspect of language is just as amenable to structuralist methods as its synchronic aspect and that every change must be treated as a function of the system as a whole (see Jakobson 1972a: 122).

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that when a linguist makes statements about 'a language', be it in relation to its synchronic structure or to its historical development, this is an abstraction from the observable reality, which can never be more than that of individuals employing speech as a vehicle of communication. And this reality as actually observed is never one of complete homogeneity. There will always be found to be differences between speakers dependent upon geographical location and social class, and there are always variations in the speech of the individual speaker dependent upon the formality of the occasion. These differences do not of course prevent communication, although it is true to say that the wider the range of individuals, localities and classes with which a speaker is confronted, the more likely is it that he will experience some difficulty in understanding everything that is said. Correspondingly, the wider the spectrum in social and geographic terms that the linguist attempts to embrace in his analysis, the greater the degree of abstraction that he must operate in order to maintain homogeneity in his data. This he will achieve in practice by eliminating from his account all individual, local and class-related variations, justifying their omission by pointing to the fact that communication is possible in spite of them and that they are not representative of the speech habits of the community as a whole. Depending upon his theoretical outlook, the linguist will therefore either restrict his analysis to a specific language sample (such as the slow careful speech of an educated speaker) and thus exclude from consideration a whole range of alternative speech patterns actually present in the community, or he will claim that his description is of *langue* (or *competence*) and thus only indirectly related to *parole* (or *performance*) to which speech variation within the community properly belongs. Different schools of thought will thus express the convention in different ways, so that for a structuralist 'descriptive procedure establishes the fiction that the various utterances to be dealt with have no temporal or spatial or social order' (Hockett) while for a generative grammarian 'a grammar of a language purports to be a description of the ideal speaker-hearer's competence', the ideal speaker-hearer being lodged in 'a completely homogeneous speech-community' (Chomsky 1965:4,3). But we shall see that, by representing something which is inherently endowed with variation as if it were of uniform structure, such conventional simplification of the data has the effect of excluding from the analysis precisely those aspects of linguistic structure which appear to be most closely connected with the promotion

of language change. For there is good evidence to suggest that synchronic variation in the speech of a community is precisely the vehicle by means of which language change progresses, the favouring or disfavouring (and thus the survival or elimination) of competing variants being governed by social pressures. The rigidly uniform structures of conventional synchronic description simply do not capture these aspects of linguistic reality.

If the degree of idealization that has gone into the description of a present language state may be checked against the spoken language, in the case of a dead language or of an earlier stage of a living one accessible only through the intermediary of written documents, such verification is of course impossible. In their case we can only guess at the distance separating the form of the language of the texts from the underlying reality. Furthermore, the language of such written texts is as a rule already the product of a considerable amount of formalization so that the linguist is obliged to work with rather uniform data which will inevitably lead to an equally uniform synchronic description. The degree of idealization required in order to achieve descriptive regularity will in fact in such cases usually be smaller than that required in the case of living languages, simply because regularity has already been largely imposed by the constraints characteristic of written style. It will thus be seen that, while synchronic description can within the limits of its own theoretical framework provide a record of the *results* of language change, the investigation of the actual change *process* will require both different data and different methods.

After this brief discussion of the part played by certain theoretical assumptions of synchronic description in concealing all direct evidence of the process of language change, we will now turn to the second factor which prevents this process from being readily accessible to observation, namely the way in which a language is perpetuated. A language only exists through the intermediary of the human beings who speak it and, since the life-spans of these are of limited duration, it must be learned afresh by each new generation of speakers if continuity is to be maintained. It has been suggested that this constantly repeated process of acquisition by young children is likely to be an important factor in language change and we will therefore examine it briefly, although it is still poorly understood in many of its details. It is clear that, while the particular language that a child will acquire is determined by its linguistic environment – it will in fact learn the

language of the community in which it grows up – every child is born with an innate predisposition towards language learning. The actual process whereby language is acquired is, however, only indirectly accessible to investigation. All that can be directly observed is the model, constituted by the speech of the people around it, and the child's own output. From these it can be deduced that, by subjecting the utterances that it hears to analysis, the child constructs its own grammar. Of the form of this grammar we are however largely ignorant and this is a serious drawback since it is precisely at this stage in transmission that inherited structures are likely to be given a new interpretation differing from that of the previous generation. Glimpses of the child's analysis of the language may, however, be had when it produces incorrect forms. The use of *goed* for *went* would thus imply 'knowledge' both of the category of past tense and of its basic marker but 'ignorance' of the exceptional status of the verb *to go*. Personal innovations of this kind will as a rule quickly disappear from the child's speech under pressure from its environment. It is, however, important to note that certain changes that have actually taken place in languages are essentially of the same nature, for instance the replacement of the older form *holp* by *helped* as the past tense of the verb *to help* in English. On the other hand transformational grammar has shown that the same output may be achieved by means of different grammars, so that even if a child's linguistic output does not observably differ from that of its models, this does not necessarily imply that their grammars are identical (cf. Halle 1962).

It would be a convenient solution if language change could be interpreted simply as the direct result of 'imperfect learning' on the part of children. Such cannot, however, be considered to be the direct cause since it fails to take account of the fact that language change has both persistence and direction. In a less immediate way, however, the assumption may contain some part of truth since the child's emerging grammar, which is after all built on limited data, may well rely more heavily on certain structures of the model, those of higher frequency for instance, than others. This necessarily selective attitude towards the model might account for the fact that, by its persistent and directional nature, language change operates as if its target had in some way been laid down in advance. That adults themselves behave in accordance with certain limited overt targets, at least where careful speech is concerned, is a well-attested fact. Members of a specific group will for instance

make a conscious effort to avoid such things as 'dropping one's *h*-s', using *aint* for *isn't*, or confusing *us* and *we*. This shows that at all ages people can, and in fact often do, modify their speech habits in conformity with social pressures from within the community.

We have seen that, because it is embedded in variation patterns current within the community, the process of language change lies for the most part outside the individual speaker's awareness; preoccupied with the social significance of alternative forms, he is largely unaware of their correlation with time. Furthermore the maintenance of communication between speakers of different generations imposes a degree of constraint on the rate at which change can take place. His awareness of language change is likely then to be only of an indirect nature, based on what experience he may have of completed change observable from the comparison of documents from earlier periods with the contemporary system with which he is familiar. The historical linguist is in essentially the same situation with regard to his sources. While the present state is the only one which can provide him with full information on all the phenomena, including the embedding of linguistic variation in the social structure of the community, it is only by comparison via written records of different stages of a language that he can obtain an idea of the nature of diachronic rules. It can, in fact, be said that there is an optimal time-lapse of say four or five centuries which is most favourable for the systematic study of change. This is so because on the one hand the differences between successive language states are then sufficiently large to allow the statement in the form of rules of completed changes and on the other continuity is not at stake – one is clearly still dealing with 'the same language'.

It follows from the foregoing considerations that a two-fold strategy for the investigation of language change is necessary: firstly we must study its results as abstracted from the grammatical descriptions of successive language states and, as we shall see later, of related languages; and secondly we must investigate the actual process of change as an ongoing phenomenon through the methods of sociolinguistic analysis. The first of these approaches will occupy us in the first part of this book, which will be concerned essentially with the systematic analysis of completed change, that is to say the nature of diachronic rules. With the insight thus gained we will then turn to the question of the connection between language change and social and geographical space, which will include contact both between varieties of a single

language and between totally different languages. It is this second, sociolinguistic, approach to language change which will be the subject-matter of the second part of the book.

We may gain a first impression of the sort of thing that we can expect with regard to language change by looking at a few examples from languages which have been written over long stretches of time, since here we have series of datable documents whose succession may be taken to reflect the way in which these languages have changed. A convenient text to take for this purpose is the Lord's Prayer, since it is the text which in the history of mankind has probably been most widely recorded.[1] It will provide us with samples of the English language as it was at the time of Shakespeare, of Chaucer, and of King Aelfric. Although on looking at these the present-day English reader may not recognize or know how to pronounce all the words they contain, he is nevertheless likely to experience a certain sense of familiarity with the language in which they are written. There will, on the other hand, be no such feeling of recognition in the case, for example, of those written in Hungarian or Welsh. This sense of familiarity clearly has to do with the fact that he can readily identify certain segments (formatives, words, phrases) with their counterparts in present-day English.

The Lord's Prayer[2]

Authorized version (1611)

Our father which art in heauen, hallowed be thy name. Thy kyngdome come. Thy will be done in earth, as it is in heauen. Giue vs this day our daily bread. And forgiue vs our debts, as we

[1] In spite of its obvious convenience, an objection to this text as a source of syntactic information regarding the earlier stages of a language is the fact that, being the translation of a highly prestigious document, the translators may sometimes have attempted to adhere so closely to the structure of the original that they have forced the translation into a 'foreign' mould. This, for instance, could be the explanation of the treatment of *heaven* as a plural in certain of the earlier versions.

[2] The various English versions, as well as the Old High German one, are taken from Kaiser (1961); the Modern German and Welsh versions are those given in Lockwood (1972), a work which contains nearly a hundred examples of the Lord's Prayer, almost all in Indo-European languages. For the Hungarian text, taken from the Károli Bible, and for its morph-by-morph translation, I am indebted to P. A. Sherwood of the School of Slavonic and East European Studies, University of London.

forgiue our debters. And lead vs not into temptation, but deliuer vs from euill.

Wycliff's version (late fourteenth century)

Oure fadir þat art in heuenes, halwid be þi name; þi reume or kyngdom come to þe. Be þi wille don in herþe as it is doun in heuene. ȝeue to vs to-day oure eche dayes bred. And forȝeue to vs oure dettis, þat is oure synnys, as we forȝeuen tu oure dettouris, þat is to men þat han synned in vs. And lede vs not in-to temptacion, but delyuere vs from euyl.

Old English (West Saxon, ca. 1000)

Fæder ure þu þe eart on heofonum, si þin nama gehalgod; to-becume þin rice; gewurþe þin willa on eorðan swa swa on heofonum; urne gedæghwamlican hlaf syle us to dæg; and forgyf us ure gyltas, swa swa we forgyfað urum gyltendum; and ne gelæd þu us on costnunge, ac alys us of yfele.

Modern German

Unser Vater in dem Himmel. Dein Name werde geheiligt. Dein Reich komme. Dein Wille geschehe auf Erden wie im Himmel. Unser täglich Brot gib uns heute. Und vergib uns unsere Schulden, wie wir unsern Schuldigern vergeben. Und führe uns nicht in Versuchung, sondern erlöse uns von dem Übel.

Old High German (East Frankish, Tatian's version, ca. 830)

Fater unser thu thar bist in himile, si giheilagot thin namo, queme thin rihhi, si thin uuillo, so her in himile ist so si her in erdu; unsar brot tagalihhaz gib uns hiutu, inti furlaz uns unsara sculdi, so uuir furlazemes unsaren sculdigon; inti ni gileitest unsih in costunga, uzouh arlosi unsih fon ubile.

Welsh (standard version, sixteenth century)

Ein tad, yr hwn wyt yn y nefoedd: sancteiddier dy enw.
Our father, that who art in the heavens, be-hallowed thy name.
Deled dy deyrnas. Gwneler dy ewyllys, megis yn y nef,
Come thy kingdom. Be-done thy will, as in the heaven

felly ar y ddaear hefyd. Dyro i ni heddiw ein bara beunyddiol.
so on the earth also. Give to us today our bread daily.
A maddau i ni ein dyledion, fel y maddeuwn ninnau i'n dyledwyr.
And forgive to us our debts, as forgive we to our debtors.
Ac nac arwain ni i brofedigaeth, eithr gwared ni rhag drwg.
And not lead us into temptation, but save us from evil.

Hungarian

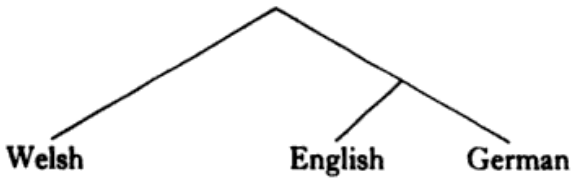
Mi Atyánk, ki vagy a mennyekben, szenteltessék meg a te
Our father-our, who art the heavens-in, hallowed-be the thy
neved; jöjjön el a te országod; legyen meg a te akaratod,
name-thy; come the thy kingdom-thy; be the thy will-thy,
mint a mennyben ugy a földön is. A mi mindennapi
just-as the heavens-in so the earth-on also. The our every-day
kenyerünket add meg nekünk ma. És bocsásd meg a mi vétkeinket,
bread-our give to us today. And forgive the our sins-ours,
miképen mi is megbocsátunk azoknak, a kik ellenünk
in the way we also forgive those-to who against-us
vétkeztek; és ne vígy minket kísértetbe, de szabadíts meg
have-sinned; and not lead us temptation-into, but set-free
minket a gonosztól.
us the evil(-person)-from.

These samples are of course not extensive enough to allow us to make a proper analysis of the language of each period, but even without analysis we may note a certain continuity in the lexicon evident in such items as *father*, *heaven*, *name*, *come*, *earth*. We can on the other hand also see that certain syntactic rules, even in the authorized version still in use today, are not the same as those of present-day English. Thus the relative pronoun *which*, reserved in current English for non-humans as opposed to *who* which is reserved for humans, is used in the authorized version to refer to God, and in the earliest version the relative clause is introduced altogether differently by means of the personal pronoun *þu* 'thou' followed by a relative particle since lost, *þe*. But the historical linguist has to do more than merely register isolated similarities and differences, he must show in a systematic way how the rules in the language have changed. Thus, although the native speaker is able to feel the connection in a subjective way, the objective justification for associating the various English versions in spite of their numerous differences, that is to say for claiming that they all belong historically

speaking to 'the same language', is the fact that *systematic relations* can be established between the grammars of successive stages. This means that the grammar of present-day English is in principle derivable by means of a series of rules from that of the English of Shakespeare's day, Shakespeare's from Chaucer's, and Chaucer's from Aelfric's.

If we now compare the languages in which the two German versions of the Lord's Prayer are written we will arrive at the same conclusion as for the languages of the English versions, namely that systematic relations hold between them and that they also therefore belong historically speaking to 'the same language'. If on the other hand we compare say present-day English and German, it will be found that although there are still a number of obvious resemblances, the relationship between their structures cannot be expressed directly in the form of rules of the type which link the various stages of English or of German. The historical linguist is, however, able to show that there is continuity between present-day English on the one hand and present-day German on the other, but that the link is not a direct one but must be made through the intermediary of an earlier common system underlying both. Diachronic rules of the type with which we are already familiar can then be set up to link that earlier common stage with each of the languages separately. Thus both languages can be shown to have developed from a common source, but along different paths or – to borrow a term from Hoenigswald (1973) – 'channels of transmission', the English of Aelfric's, Chaucer's and Shakespeare's times constituting one channel, the German of Tatian's, Wolfram's and Luther's periods the other. Because of their evolution from a single common ancestor, English and German are said to be *related* languages, and we ascribe their present-day similarities to their common origin, their differences to the fact that they have reached the present through different channels of transmission.

Welsh and English (or for that matter Welsh and German) are also related languages, although casual inspection of our text would hardly convey that impression. This is because they are much more distantly related than are English and German, that is to say they are separated from their common ancestor by a much greater time-depth and therefore by a correspondingly larger number of diachronic rules. The common ancestor of English and German, in fact, is merely an intermediate stage in an overall development which may be represented diagrammatically as follows:



The example of Welsh shows that relatedness cannot necessarily be discovered by simple inspection. On a purely subjective basis Welsh certainly looks about as different from English as does Hungarian, and yet Welsh can be shown to be related to English while, at least in the present state of our knowledge, Hungarian cannot. Hungarian is in fact one of the few languages of Europe which do not belong to the Indo-European language family, being a member of the Finno-Ugric family of languages and related to Finnish. Whether or not the two language families are in fact themselves ultimately related cannot at present be ascertained by the methods of historical linguistics.

The theoretical justification for considering certain languages to be related, that is to say reflexes of a single parent language, rests on two observations: on the one hand there are certain inherent restrictions on the nature of the steps which can take place in language change and on the other the relationship between form and meaning in language is, in the vast majority of cases, an arbitrary one. A language may therefore be thought of as a sign system in which specific sound sequences represent specific meanings but in which, onomatopoeia and sound symbolism apart,[1] there is no necessary connection between any

[1] In all languages, of course, the arbitrariness principle is marginally violated by the presence of onomatopoeic and sound symbolic forms, in which the relationship between phonological form and meaning is to some extent motivated. Onomatopoeic forms imitate real sounds, typical examples being the name of the *cuckoo* (English *cuckoo*, German *Kuckuck*, French *coucou*, etc.) or the term used to describe the crowing of a cock (English *cock-a-doodle-doo*, German *kikeriki*, French *cocorico*), all from their actual cries. Forms such as these are, however, sufficiently restricted to well-defined semantic fields for them not to invalidate the arbitrariness principle and it should be noted that, even in their case, there is considerable latitude between the model and its linguistic codification. Sound symbolism, on the other hand, is a much less tangible phenomenon, being motivated not so much by direct imitation of an extra-linguistic acoustic model as by association with the sounds of lexical items or of parts of lexical items already existing in the language. Associative fields are thus built up of the type *flip*, *flap*, *flop*, *flick* etc. in English, the members of which are often found on investigation to be innovations of the post Middle English period (Marchand 1960: 313–55). Sound symbolism may of course be treated simply as a special case of onomatopoeia in which the

particular sequence of sounds and any particular meaning. In other words the link between phonological form and meaning is not a natural one, determined in some way by the nature of the referent, but a purely conventional one – as de Saussure put it, *the linguistic sign is arbitrary*.[1] Granted that this is so, each language can be seen to be a unique system of rules which, by relating forms to meanings, enables communication within a society. Continuity of communication depends on the system being handed on to each following generation by a process of language learning, and it is obvious that severe constraints must be imposed on the degree of deviation from the model which is permissible at each stage if communication between generations is not to be impaired. This is in turn reflected in the observation that the differences between successive language states, even over time-spans of several centuries, are relatively small and that related languages which are separated from their common ancestor by a comparable time-depth are still recognizably similar.

It is these two facts, that the relationship between form and meaning in language is an arbitrary one and that languages can only change through a succession of restricted steps, that gave significance to certain discoveries that were made by linguists some two hundred years ago when the Sanskrit language of Ancient India became for the first time fully accessible to European scholarship. Despite differences in geographical location and in the cultural content expressed through them, Sanskrit, Greek and Latin were found to exhibit such remarkable similarities in the phonological form of corresponding morphs and in the rules which govern the combination of these that descent from a common ancestor was clearly the only possible hypothesis that could account for them. In the first example we will compare paradigms of the past (or imperfect) tense of the verb 'to carry' in Greek and in Sanskrit. For greater clarity each verb form has been segmented into morphs on the basis of the synchronic grammar, although justification

model is linguistic rather than natural; and, because of the lexical basis of its associations, these are even more language-specific than in the case of simple onomatopoeia.

[1] De Saussure 1964: Part 1, chapters 1 and 2. Benveniste (1966: 49–55) draws attention to the fact that there is a certain amount of confusion in de Saussure's description between 'meaning' (*signifié*, concept) on the one hand and referent (the object named) on the other. This old problem of the relationship between form and meaning in language – whether it be a natural or a conventional one – was widely debated in Antiquity and forms for instance the topic of Plato's *Kratylus* (Robins 1967: 18).

for this segmentation cannot be gone into here. The morphs in both languages are, from left to right: (i) past tense marker (or augment); (ii) root; (iii) thematic vowel, a functionally marginal morph which alternates with zero in certain other verbs and which could for our present purposes just as well be considered as forming a part of the personal ending; (iv) personal ending (the digraph *ph* in Greek represents a voiceless aspirated plosive /p^h/, contrasting with /p/ and /b/; Sanskrit *bh* represents a voiced aspirated bilabial plosive /b^h/ contrasting with /b/, /p/ and /p^h/):

Greek		Sanskrit
é-pher-o-n	1. singular	á-bhar-a-m
é-pher-e-s	2. singular	á-bhar-a-s
é-pher-e	3. singular	á-bhar-a-t
e-phér-o-mes (West Greek)	1. plural	á-bhar-ā-ma
e-phér-e-te	2. plural	á-bhar-a-ta
é-pher-o-n	3. plural	á-bhar-a-n

The morphs, which correspond in both languages in order of occurrence as well as in grammatical function, can be seen to correspond also in phonological form provided that the following rules to relate them are set up:

Sanskrit /a/ corresponds to Greek /e,o/
Sanskrit /b^h/ corresponds to Greek /p^h/
Sanskrit /-m/ corresponds to Greek /-n/
Sanskrit /-t/ corresponds to Greek -ø

These rules leave unaccounted for only the ending of the first person plural (which does raise a certain number of problems) and the position of the accent in Greek (which is however predictable by a general rule, so that the difference from the Sanskrit is not significant). Now the likelihood of finding in any two languages such correspondence in form, function and arrangement of such a series of morphs as the result of pure chance is infinitesimally small.

As a second example, let us compare some of the case forms of the words meaning 'family, kind' in Greek, Latin and Sanskrit (the cases are labelled after the fashion of traditional grammar; *j* in Sanskrit stands for a voiced palatal plosive /ɟ/):

	Greek	Latin	Sanskrit
nominative-accusative	génos	genus	jánas

genitive	géneos (dialectal)	generis	jánasas
locative	génei ('dative')	genere ('ablative')	jánasi

It will be seen that the Greek and Latin forms present problems of segmentation when compared with more regular paradigms such as Greek *néktar* 'nectar', *néktaros*, *néktari* and Latin *nomen* 'name', *nominis*, *nomine*. Only the Sanskrit forms do not present similar problems. However if we assume that Greek has dropped intervocalic /s/ and that Latin has replaced intervocalic /s/ by /r/ and final /i/ by /e/, a hypothetical stem **genos* ~ **genes-* (the star indicating that the forms are not attested) may be postulated as a sort of common denominator. If the vowel correspondences are taken to be the same as in the previous example, only the Latin genitive ending remains unaccounted for. This device brings irregular paradigms of Greek and Latin into line with the more regular ones of *néktar* and *nomen* and at the same time reduces to a unitary paradigm the disparate forms of the three languages. The paradigm underlying all three might then be represented as nominative-accusative **genos*, genitive **genes-es* (*-os*), locative **genes-i*. Note also that the alternation /e/ versus /o/ of the second vowel is not unlike that of the thematic vowel in the previous paradigm.

Justification for the 'reconstruction' method illustrated above and for interpreting the unattested constructs marked with a star as forms of an actual earlier linguistic state preceding the three languages, cannot be given at this point. It will however be seen that the concept of 'correspondence' presupposes the existence of such constructs and of the rules that link the grammars of related languages. Why such hypothetical constructs may be claimed to represent the forms of an earlier language state will be discussed in chapter 1.

PART ONE

Models of language development

In order to describe the way in which a language has developed over a given stretch of time we require a theoretical framework (or *model*) within which the facts may be stated and explained. Ideally such a model should be capable of accounting for all the changes which have taken place in the language by reducing them to a systematically integrated set of rules. Any particular phenomenon will then be considered as 'explained' if we can state it in terms of these rules. All three chapters which follow will deal with the same subject-matter, namely the observable phenomena of language change; they will, however, differ in the way in which they describe these phenomena and in how they integrate them into an explanatory system. This diversity of treatment raises the obvious question of whether the mere restatement of some particular regularity in different theoretical terms is in itself any advance on previous knowledge. However, different models are bound to result in different questions being asked of the data and this in turn can lead not only to better explanations of already known facts but also to the discovery of new ones.

In this first, systematic, section of the book the emphasis will be on the linear development of language through time. The fact that contact between societies results in mutual influence will for the time being be disregarded, so that loan-words and areal features once adopted will be treated as forming an integral part of the language. We will thus for the moment assume that languages are of homogeneous structure and are isolated from one another in space; the questions of the origin and integrating process of loans will be dealt with separately in Part Two.

The three models chosen for description will be taken in chronological order. The neogrammarian model was the earliest, and still constitutes the essential foundation upon which both the structuralist (or 'taxo-

nomic') and the transformational-generative models were erected, these constituting no more than elaborations and modifications of it. They do, however, by adopting different theoretical positions with regard to a number of issues, present alternative hypotheses concerning the nature of language change.

I
The neogrammarian model

1 Basic issues

We have said that a theoretical model if it is to be considered adequate must be capable both of describing and accounting for the observed phenomena. Which phenomena are in fact selected for attention by the linguist at any particular period will depend upon prevailing attitudes towards the subject and towards scientific investigation in general. Two main issues dominated the early course of historical linguistics, namely synchronic irregularity within individual languages and the nature of the resemblances existing between related languages. As we shall see, the two questions are in fact intimately connected.

1.1 *Synchronic irregularity*

One problem which obviously requires explanation in a language is its so-called irregular forms, and it could even be said that the more irregular the form the greater the need for it to be explained. Regular past tense forms like ***grabbed*** /græbd/ or ***hoped*** /houpt/ may perhaps be taken for granted, but why should ***to keep*** have a past tense ***kept*** /kept/ or ***to bleed*** /bli:d/ a past tense ***bled*** /bled/? We describe these last two forms as irregular because they do not follow the productive rule for forming the past tense in English which, depending upon the nature of the final segment of the verbal base, suffixes one of the alternants /-d, -t, -id/. We say that this rule is 'productive' because if native speakers of English are asked to form the past tense of some real or hypothetical English verb that they have never heard before they will without hesitation produce a form in compliance with it. Past tense formation thus consists in the affixation of an alveolar plosive, the selection of the precise alternant being automatic (that is to say, it is entirely conditioned by the phonological environment). What makes /kept/ and /bled/ exceptional is that in both their cases past tense

formation entails some alteration of the verb base itself. Both verbs replace the vowel /i:/ of the base by /e/, but whereas in the case of /kept/ the vowel alternation is merely additional to suffixation of the past tense marker, it in itself constitutes the marker in the case of /bled/. Neither of these patterns is productive in Modern English, the verbs which follow them forming closed classes which can be defined only by listing. The historical linguist can however show that in an earlier stage of the English language the rules which produced the forms ancestral to *kept* and *bled* were just as regular in terms of the grammar then operating as are those producing *hoped* and *grabbed* today and that it is only as the result of phonological changes that have taken place subsequently that the morphological structure has become obscured. Thus in Old English (or Anglo-Saxon, as it is sometimes also called) weak verbs of the class to which these two verbs belonged formed their past tense by suffixing *-ede* or *-de/-te* to the verb base, the choice of the alternant being phonologically conditioned.[1] In the case in question the forms were *cēpte* and *blēdde*, formed from the bases *cēp-* and *blēd-* (infinitives *cēpan*, *blēdan*). The present-day past tense forms are the result of a whole series of subsequent phonological changes which have operated on the Old English forms: first all long vowels were shortened before sequences of two consonants, then unstressed *-e* in final position was dropped, and lastly all word-final long consonants were shortened. The current forms of the present tense stems on the other hand are the result of a change in the quality of long vowels when not followed by two consonants, so that *ē* (but not *e*) was raised to /i:/ to give the present-day alternation in the stem vowel.

It is on the basis of cases such as these that it has been claimed that if a grammar is to go beyond the mere statement of individual facts (such as lists of alternants and of the stems that take them) and is to *explain* these facts, it must necessarily be a historical grammar in which irregular forms are shown to be 'motivated' by reference to rules operative in earlier periods of the language.[2] Irregular forms are thus

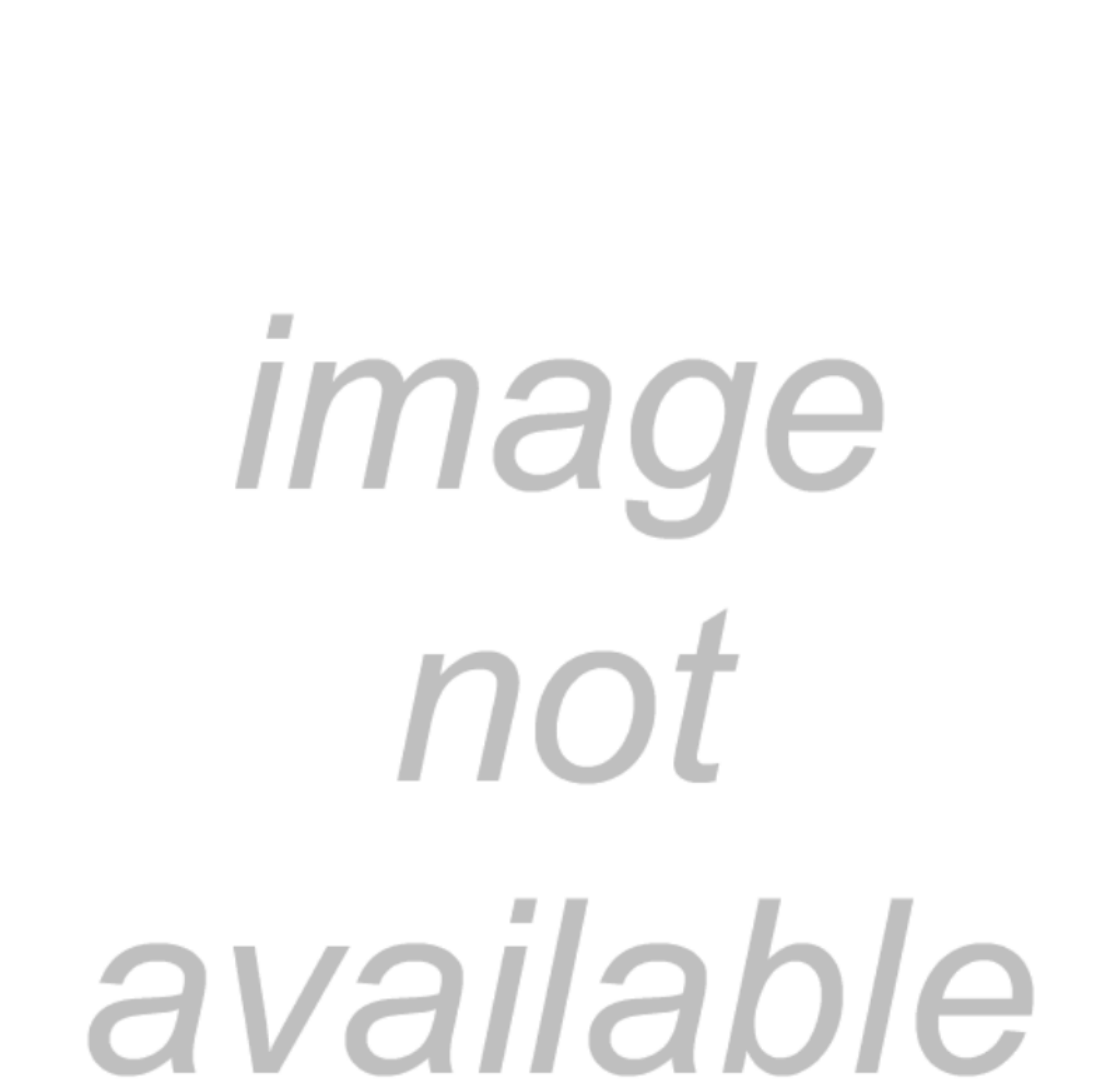
[1] Verbs of the first weak class, to which our examples belong, took *-ede* after short syllables and, depending upon the preceding segment, *-de* or *-te* after long syllables (that is to say those containing either a long vowel or a final consonant cluster). For the weak verbs taken as a whole, however, the choice of the past tense alternant was already in Old English only partly determined phonologically (Campbell 1959: 321ff.).

[2] In view of its relevance to present-day discussions, Hermann Paul's famous passage is perhaps worth quoting in full: 'It remains for me to

not forms which are not reducible to any sort of rule but simply forms which do not comply with currently productive rules.

This view is dependent upon the assumption that, at any given stage in the history of a language and for any particular grammatical category, there is one basic mechanism or set of mechanisms relating

> briefly justify why I have chosen the title "Principles of the *History* of Language". It has been said in criticism of this that a historical analysis is not the only possible scientific analysis of language. This I must reject. What some consider to constitute a non-historical and yet scientific analysis of language is in fact no more than an incomplete historical one – incomplete partly due to the fault of the analyst and partly due to the fault of the data. As soon as one goes beyond the mere statement of individual facts and attempts to comprehend the connection [between them], that is to say to understand the phenomena, one enters the realm of history although perhaps unconsciously. A scientific analysis of language is indeed by no means only possible when we have at our disposal different stages in the development of one and the same language but also when the available data occur simultaneously. The situation is most favourable when several related languages or dialects are known to us. The task of science is then not simply to state what correspondences exist between them but, in so far as that is possible, to reconstruct from the attested data the non-attested basic forms and meanings. But in this process the comparative analysis becomes a historical one. And even when only a particular stage of development of a single dialect is available scientific analysis is still to some degree possible. But how? When for instance one compares the various meanings of a word, one attempts to establish which of them is the basic meaning or to which lost meaning they point. However, once one establishes a basic meaning from which the others are derived one is making a historical statement. Or if one compares related forms and derives them from a common basic form, once again one is making a historical observation. Thus, unless one is prepared to enter the realm of history, it is quite unjustifiable to claim that related forms are derived from a common source. Or again we may state that [within a single language] there is phonological alternation between related forms and words. But if one wishes to explain this one is necessarily led to conclude that it is the after-effect of a sound change, that is to say of a historical process. If one attempts to characterise the so-called "inner form" of language, as this term is used by Humboldt and Steinthal, one can only do so by tracing the origins of expressions and their basic meanings. And so I cannot conceive how one could with any hope of success think about a language without discovering at least to some extent how it came to be as it is. The only aspect then which might conceivably remain as suitable for non-historic investigation might be general considerations regarding individual usages of language, that is to say the behaviour of the individual speaker relative to general usage, which would include language acquisition. That, however, precisely these considerations are to be intimately connected with the analysis of the historical development of language will emerge in the course of the following pages' (Paul 1970: 20–2).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forms and how the differences between such similar forms have arisen. Compare, for instance, the set of lexical items and grammatical formatives in English and German in Table 1.

Comparison of the two sets of forms elicits two observations. Firstly, it is apparent that in view of the fundamentally arbitrary nature of the connection between form and meaning in language, corresponding English and German forms are far too alike for this to be the result of pure chance. The arbitrariness principle, in other words, clearly demands a *historical* link between the two sets. In the second place it can be seen that corresponding items differ in their phonological form in a systematic way (e.g. /tu/ : /tsu/, /ten/ : /tse:n/, etc.). The difference is however not a simple one in the sense that where English has say a /t/ German always has a /ts/; rather we must state the rule as being that where English has a /t/ no sound other than /ts/, /s/ or /t/ is found in German. And what is more important is that this regularity is not confined to the items contained in the list but holds in principle (certain loan-words apart, see chapter 6) throughout both languages. Our historical hypothesis will ascribe the similarities between the two languages to the fact that both have evolved from a single earlier parent language and their differences to the split-up of that earlier language into two branches which then underwent separate development. As we shall see in detail below (p. 49ff.), it is in fact possible to show that a /t/ of the common earlier language state was retained in English but became /ts/, /s/ or /t/ in German depending upon the phonetic environment. Since this change affecting /t/ was rule-governed, the resulting German forms stand in a systematic formal relationship to their English counterparts. And, since the same principle applies to language change generally, it may be stated that related languages resemble each other in a systematic way.

This fact that both synchronic irregularity and cross-language resemblances can only be explained by reference to earlier language states and to the systematic nature of language change is the topic to which we shall now turn.

2 The Indo-European languages

The systematic study of language evolution and the setting up of hypotheses regarding the nature of language change was to prove particularly fruitful in the field of the Indo-European languages (see table p. 68f.), largely because of the nature of the material available for

investigation. In the first place this family comprises a number of fairly closely related groups of living languages such as Germanic (English, Dutch, Frisian, German, Swedish, Danish, Norwegian, Icelandic), Romance (French, Provençal, Spanish, Catalan, Portuguese, Italian, Sardinian, Rhaeto-Romansh, Romanian), Slavonic (or Slavic) (Russian, Ukrainian, Polish, Czech, Serbo-Croatian, Bulgarian), and Indo-Iranian (Hindi-Urdu, Panjabi, Gujarati, Marathi, Sinhalese etc. forming the Indic branch, and Persian, Pashto, Kurdish etc. forming the Iranian branch). In addition to this wealth of present-day material there exist for practically every one of these groups, as well as for isolated members of the family such as Greek, written documents going back over many centuries – in the case of Indo-Iranian and Greek well into the second millennium B.C. – so that the investigation of their historical development is possible over an unbroken period of two to four millennia. In the second place there are very ancient records of at least some Indo-European languages, mainly of Vedic Sanskrit, Mycenaean Greek and Hittite, which show that by the second millennium B.C. these languages were already very considerably differentiated, making it possible to reconstruct forms of even earlier date by the comparison of attested divergent forms. Thus Indo-European historical linguistics as a whole spans a time-depth of at least five millennia. If, then, general principles are to be postulated with regard to the nature of language development, the Indo-European languages represent a most suitable field of inquiry and a very important testing ground for hypotheses. It is thus perhaps not surprising that theoretical claims regarding the nature and regularity of language development have come principally from scholars working in this field.

3 The neogrammarians

It is the so-called neogrammarians, a group of Indo-Europeanists working at or in association with the University of Leipzig during the last decades of the nineteenth century, who are credited with putting historical linguistics onto a scientific footing for the first time because they explicitly formulated the methodological principles and theoretical postulates which guided their work and put them to practical test. By the 1860s and '70s the bulk of the Indo-European languages were sufficiently well known and had been studied for long enough for the existing knowledge about them and the hypotheses accounting for their individual histories to be integrated into 'an outline comparative gram-

mar of the Indo-European languages'.[1] The neogrammarians were thus primarily engaged in the practical task of making a comprehensive and orderly statement of the body of knowledge which had by then been assembled, and it is against this background that their theoretical claims about the nature of language change in general must be seen.

The general position from which the neogrammarians approached their subject was the assumption that language change must have order and thus be amenable to systematic investigation. They based their expectation that language development is rule-governed on certain universal aspects of language itself, namely its use by human beings for purposes of communication, the uniform way in which it is transmitted from one generation to another, its production by means of a common articulatory apparatus, etc. Since language is essentially a human activity it was argued, guiding principles for the study of its evolution should be sought within the general rules that govern human behaviour.[2]

In order to account systematically for the phenomena of language change the neogrammarians found it necessary to postulate two fundamental principles governing the development of language through time, namely *sound change* and *analogy*. Sound change deals with processes operating at the phonological level while analogy deals with those at the grammatical (morphological and syntactic) level. The approach thus presupposes a 'dual articulation' of language (Martinet 1964:22), with the phonological and the grammatical levels structured independently of each other and each exhibiting different kinds of regularity.

4 Sound change: the regularity principle

At the phonological level, the neogrammarians claimed,

[1] *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen* (by K. Brugmann and B. Delbrück, Strassburg, 1886–1900).

[2] See Osthoff and Brugmann 1878; this article is often referred to as 'the neogrammarian manifesto'; see also Delbrück 1919, Paul 1970, Jankowski 1972. The views expressed by the neogrammarians were new by comparison with what had gone before; only a few years earlier Schleicher had claimed that languages were natural organisms with 'lives' of their own, comprising a period of evolutionary progress followed by a period of decay. He considered them to be organisms in their own right on the grounds that the rules of their development were apparently independent of the will of man. Something of this attitude lingered on in the thinking of at least some neogrammarians who claimed sound change to be completely *mechanical*, that is outside the consciousness of the speaker, and thus purely a matter of physiology; only analogy was to be considered a psychological matter (cf. Osthoff 1878a: 13).

language change is governed by the principle of ***the regularity of sound change***. This states quite generally that the conditions which govern sound change are purely phonetic ones. Applied to specific changes in particular languages this means that (a) the direction in which a sound changes is the same for all the members of the speech community in question (unless a division into two dialects is in progress), and (b) that all the words in which the sound undergoing the change occurs in the same phonetic environment are affected by the change in the same way (Osthoff and Brugmann 1878). Restated in modern phonemic terms, (b) says that phonological change proceeds through the intermediary of positionally defined allophones, position in turn being stated within the framework of 'the word' as the basic linguistic unit.[1]

In the following discussion we have to a limited extent anticipated structuralism. Instead of talking about 'sounds', as would have been historically speaking more accurate, I have anachronistically introduced the distinction between allophones and phonemes which was made only later by phoneme theory. Such overinterpretation can, I think, be justified since neogrammarian phonology was, insofar as the syntagmatic aspect is concerned, implicitly phonemic. The neogrammarians share with the proponents of so-called taxonomic linguistics the claim that the phonological level is autonomous and independent of grammatical structure – or, to put it more precisely, that phonological rules can be formulated which make no reference to morphology, syntax and semantics.

The rules which govern sound change are thus (1) exclusively phonological since they are independent of the morphological, syntactic and semantic function of the word to whose segments they apply; (2) 'exceptionless', that is to say that all the data which fall within the scope of a rule have to be accounted for and if any data should violate the rule and not be explainable by reference to some other linguistic principle the rule is invalidated. We shall see that the scope of a rule

[1] The 'word' was, it seems, taken for granted as the linguistic unit *par excellence*: on the one hand it was a phonological unit consisting of sounds, on the other it was a lexical unit the different forms of which were described in the morphology and from which sentences were formed. With the emphasis on written languages of the past, segmentation into words probably followed the native scholarly traditions in the languages concerned. Discrepancies between morphologically defined and phonologically defined words were resolved by having a class of enclitics. This will be dealt with again in chapter 3 when the issue of the autonomous or non-autonomous nature of phonology is discussed.

includes not only its input but also the limits of its applicability in terms of time and space. In practice this rigorous demand for a systematic search for the reasons underlying apparent exceptions led to spectacular progress in the Indo-European field, fully justifying the theoretical position adopted. The principle of regularity was generally accepted, as a working hypothesis at least, even by those who objected to the way in which it was formulated.[1] Only such rigour of method made it in fact possible to isolate certain principles other than sound change as determining language change, the most important being analogy and borrowing (see below, section 5 and chapter 6).

As a first example of a sound change we will take the case of *umlaut*, that is to say the fronting of back vowels in certain environments in a number of Germanic languages. Table 2 contains the base, comparative

TABLE 2

Old High German	Middle High German	Modern German
hōh	hōch	hoch /ho:x/
hōhiro	hœ̄here	höher /'hö:ər/
hōhisto	hœ̄heste	höchste /'hö:kstə/
hōho	hōhe	hoch /ho:x/
scōni	schœ̄ne	schön /ʃö:n/
scōniro	schœ̄nere	schöner /'ʃö:nər/
scōnisto	schœ̄neste	schönste /'ʃö:nstə/
scōno ('properly')	schōne	schon /ʃo:n/ ('already')

and superlative of the adjectives 'high' and 'beautiful' together with the corresponding adverbs in three successive stages of the German language: Old High German (approximately 800–1100), Middle High German (1100–1500), and Modern German (after 1500). (For the earlier stages of the language we have only given the orthographic forms since they are for all practical purposes phonemic; for Modern German a phonemic transcription is given in addition.)

It will be seen that in Old High German all forms contain the vowel

[1] Schuchardt (1885, Vennemann and Wilbur 1972) objected to the concept of 'exception' on the grounds that it was a mere surface assessment of the phenomena and demanded a deeper analysis of the relationship between sound change and analogy.

illustrated from these examples. French /k/, /ʃ/ and /s/ are no longer in complementary distribution because of subsequent changes which included the passage of the sequence /a/ plus /l/ to the back vowel /o/ (*calidus* 'warm' becoming *chaud* /ʃo/) so that [ʃ] now also occurs before a back vowel. Furthermore, the labiovelar /k^{w}/ of Latin has resulted in French [k] (*quis* 'who' becoming *qui* /ki/), so that this now also occurs before vowels other than back vowels. The [s] from Latin /k/ on the other hand has fallen together with the [s] from Latin /s/, which occurred before certain consonants and before any kind of vowel (*septem* 'seven' becoming *sept* /sɛt/, *saltare* 'to jump' becoming *sauter* /sote/), resulting in a contrast between /s/ and /k/ before front vowels.

Reviewing what has happened in both the German and French examples, it may be said that these so-called *conditioned changes* operating in specific phonetic environments all constitute a partial assimilation of successive segments in the spoken chain, for the fronting of back vowels in the environment of a high front vowel, the various palatalizations of /k/ in the environment of high and low front vowels, and the 'weakening' to the point of loss of unstressed final vowels may all be described in this way. It must, however, be remembered that we have stated the changes in phonemic terms, so that by saying that Old High German /'sko:ni/ has become Modern German /ʃö:n/ we do not rule out the possibility of the pronunciation ['skö:ni] in Old High German times; on the contrary, its existence at least at a period prior to the neutralization of unstressed vowels is to be assumed from the later development. The important point is the phonological status of [ö:]. While in Old High German [ö:] was merely an allophone of /o:/, in Modern German it constitutes a separate phoneme in its own right. There are, of course, certain very close associations of /o:/ and /ö:/ at the *morphological* level in Modern German (see p. 140f.). In the case of the French reflexes of Latin /k/ on the other hand, the palatalized reflexes /s/ and /ʃ/ are associated with /k/ in a much more marginal fashion. Phonologically speaking changes of this kind are all instances of phonemic *split*, that is to say the splitting off of allophones from phonemes. Our examples show that split operates in two quite different ways: either an allophone may split off from one phoneme and join another (as in the case of French [s] from Vulgar Latin /k/), or what were merely conditioned allophones of a single phoneme may become independent phonemes when a contrast in the phonetic environment which had maintained their complementary distribution collapses

(as in the case of French /ʃ/, after /a/ plus /l/ had resulted in back vowel, or in the case of umlaut, after unstressed /i/ and /o/ had become /e/). The term *primary split* has been used by structuralists for the former phenomenon, *secondary split* or *phonologization* for the latter (Hoenigswald 1960:77; Jakobson 1972a; see below p. 77ff.).

One far-reaching effect of conditioned sound change is the creation of morpheme alternants. The morphological consequences of umlaut in German, as has already been mentioned, play a prominent part in inflection and derivation. In English, the back vowels of which also underwent umlaut, the resulting rounded front vowels have subsequently become unrounded, merging with the old unrounded vowels and sharing their later developments (/i:/ becoming /ai/ and /u:/ becoming /au/). As a result of these further changes *mice* /mais/ (Old English *mȳs*, from *mūs* by umlaut) now rhymes with *ice* (Old English *īs*), and *king* (Old English *kyning*, from a reconstructed earlier form *kuning*) rhymes with *ring* (Old English *hring*). Traces of umlaut in English morphology are, however, rarer than in German because many of the older forms have been replaced. The more important survivals include *foot* : *feet*, *goose* : *geese*, *mouse* : *mice*, *louse* : *lice* in the inflectional morphology, and *blood* : *bleed*, *food* : *feed*, *stank* : *stench* in the derivational morphology. In this latter category the synchronic link between base and derivative has often been further severed through semantic change; thus, while German *Tag* 'day' and *täglich* 'daily' are well integrated in a morpho-semantic relationship, in cases like *Grund* 'ground' and *gründlich* 'thorough', or *Punkt* 'point' and *pünktlich* 'punctual, punctilious', a semantic connection is no longer felt by the native speaker so that *pünktlich* and *gründlich* are just as isolated lexically as *grün* 'green' and *Tür* 'door' which lack related forms with back vowels altogether.

Unconditioned change, in contrast to conditioned change which is what we have been discussing so far, is not dependent upon phonological environment but affects all the allophones of a phoneme. The change from Vulgar Latin /u/ to French /ü/ is a case in point. Looked at in isolation, we have here no more than a change in the phonetic realization of a phoneme. In fact, however, the change introduces a new *type* of sound, a rounded front vowel, into the phonological system and thus forms part of its overall reorganization (Haudricourt and Juilland 1949:100–4). This latter aspect will not however be pursued at this point since it presupposes methods of structural lin-

guistics which were not fully available to the neogrammarians (see chapter 2).

The type of unconditioned phonological change *par excellence* is the falling together, or merger, of two phonemes into one. If all the allophones of two phonemes merge there is no way of discovering retrospectively whether in any particular word the resulting phoneme derives from one rather than the other of the source phonemes: merger is thus described as being *irreversible*. For instance, in German the Middle High German diphthongs /ei/, /ou/ and /öü/ merged with the long vowels /i:/, /u:/ and /ü:/ respectively, to give /ai/, /au/ and /oü/:

Middle High German
'willow' 'pasture' 'mouse' 'smoke' 'people' 'joy'
/'vi:de/ /'veide/ /mu:s/ /roux/ /'lü:te/ /'fröüde/

Modern German
/'vaidə/ /'vaidə/ /maus/ /raux/ /'loütə/ /'froüdə/
Weide Weide Maus Rauch Leute Freude

Basing ourselves upon Modern German alone there is absolutely no way of telling whether, in any particular word, the source of /ai/ was /ei/ or /i:/, of /au/ was /ou/ or /u:/, of /oü/ was /öü/ or /ü:/. Only a knowledge of Middle High German or comparative evidence from a dialect which has not undergone the merger will allow one to sort them out. However, if only certain allophones of a phoneme have merged with those of another, as in the Romance case cited above where the allophones of /k/ before high front vowel merged with /s/, and if the conditioning environments remain intact, some clues remain as to the earlier situation. In that case it can at least be stated that any /s/ which is *not* followed by a high front vowel does *not* derive from /k/. In the environment of a high front vowel the original situation is, however, just as irrecoverable as in the German example.

As a result of merger, what were originally distinct forms may become homophonous, for instance Modern German /'vaidə/ which means both 'willow' (from /'vi:de/) and 'pasture' (from /'veide/), /laip/ which means 'body' (from /li:p/) and 'loaf' (from /leip/). Although Standard German orthography sometimes makes a distinction (*Leib* 'body' but *Laib* 'loaf') this is not always so (cf. *Weide*, both 'willow' and 'pasture'). Such cases of homophony are perhaps even more frequent in English: /mi:t/ *meat* (Old English *mete*) and *to meet* (Old English *mētan*); /ri:d/ *reed* (Old English *hrēōd*) and *to read* (Old English *rædan*), etc.

5 Analogy

The fundamental neogrammarian contention that phonological change is strictly independent of structure at the higher levels carries with it the corollary that phonological and grammatical structure may get out of step with one another during the course of time. This means that the rules which link phonological and grammatical structure may require readjustment and redefinition for each new language state.

As an example of the consequence of phonological change on grammatical structure we may take the case of the merger which affected the vowels in final unstressed syllables in English to give a single unstressed vowel, represented in the spelling by an *e*. This change, coupled with the loss of final *-n* and *-m* in these same syllables,[1] had the effect among others of reducing the six different forms of the Old English paradigm of nouns of the class to which *stān* 'stone' belongs to three (see Table 4).

TABLE 4

Old English		expected forms after phonological changes	Middle English
sg. nom.acc.	stān	stān	common stōne
dat.	stāne	stāne	
gen.	stānes	stānes	gen. stōnes
pl. nom.acc.	stānas	stānes	
dat.	stānum	stāne	common stōnes
gen.	stāna	stāne	

Subsequently the *-e* was lost, although it is often retained and has even been generalized in spelling. As a result Middle English had only two phonologically distinct forms, *stone* and *stones*, and the only morphologically marked forms were the genitive singular in *-s* and the formally

[1] According to Baugh (1965: 190ff.) the development *-um* > *-an* > *-en* > *e* was the result of sound change; Mossé (1959: 71) on the other hand attributes it to analogy, which would explain adverbial forms like *seldom* and *whilom* as relics. Bazell has however noted (1975: 102) that, in specific texts at least, *-on* and *-um* occur side by side with a characteristic distribution, *-on* being found in *pluralia tantum* and in the adverb *hwilon*, *-um* elsewhere. From the fact that the former group were not only the first to lose *-um* but also the last to retain it, he deduces that the change of *-um* to *-on* was not irreversible: under certain conditions *-um* could in fact be restored analogically.

identical plural, which had been extended from the nominative-accusative to the whole plural. As a result the Middle English system had in fact only two cases, 'common' and 'genitive'.

On the other hand English now had, for the first time in its historical development, a separate exponent of 'plural', for in Old English the exponents of this category were conflated with and inseparable from those of case (that is, only 'nominative singular', 'nominative plural', 'dative singular', 'dative plural' etc. were represented by formally identifiable units, there being no partial phonological similarity between the corresponding case forms of singular and plural). Of course 'plural' was not a new category syntactically speaking since verbal concord had all along depended on the number (singular or plural) of the subject of the sentence, it is only the direct representation of plural in the morphology which was new. This may have been the result of the easy segmentability of such plurals as *stones* into *stone* plus *-s*; at any rate whatever the ultimate underlying cause, there can be no doubt that the restructured paradigm of this class of noun acted as a model in the subsequent reshaping of the entire noun system.

We will illustrate this reshaping process from just one class of noun, namely that of the type *sorg* 'sorrow', *rōd* 'cross', *wund* 'wound', whose inflection in Old English was as follows:

singular: nominative *sorg*, genitive-dative-accusative *sorge*
plural: nominative-accusative-genitive *sorga*, dative *sorgum*

It can easily be seen that in nouns of this declension the reduction of unstressed final syllables would have had the effect of completely obliterating all case and number distinctions. In Modern English, however, words of this type have genitive and plural forms in *-s*, just as *stone* does. The only difference is that in words of the *stone* class the forms in *-s* are justified in the sense that they are the continuation of forms ending in *-s* which belonged to the paradigm of this word in earlier stages of the language, whereas the ancestral forms of *sorrow* and *wound* never had forms in *-s* in their paradigm. The presence of *-s* in these must then be the result of a transfer to their paradigms of the *-s* morphs from the *stone* class on the basis of a synchronic segmentation: base (that is, in practice, the common case singular) plus *-(e)s*. The relationship between the paradigm of the class which served as model and that of the class which was attracted may be expressed in the form of the equation: *stone* : *stones* = *wound* : *x*, where *x* is *wounds* rather

change operated not only between the strong and weak conjugations but also within the class of strong verbs itself, so that the surviving strong verbs have seldom retained the exact forms which might be expected on purely phonological grounds from a comparison with the corresponding Old English forms. It should also be noted that parallel changes have taken place in all the Germanic languages and it has in fact been claimed that the grammars of these have still not fully readjusted morphologically to the phonological changes of the early Germanic period.

The first result of these analogical changes on the morphology of the noun and of the verb was merely to effect a redistribution of the morphs representing specific grammatical morphemes, leading to a decrease in the *incidence* (that is to say the frequency of occurrence) of irregular morphs but very little reduction in the actual overall number of allomorphs representing these morphemes. Thus, although the genitive in *-s* has been generalized to all English nouns[1] and has no longer a zero morph as one of its alternants, the plural in *-s* still alternates with zero, *-n* and vowel change in a few cases (*sheep*, *oxen*, *women*, etc.), so that all irregular allomorphs have not been entirely eliminated. The same applies in the case of the past tense forms of the verb. There still remain a large number of strong verbs, so that the total number of alternants of the past tense morpheme has probably remained relatively stable. The changes have thus not substantially reduced the number of *rules* required for plural and past tense formation although they have greatly increased the frequency of the regular alternants. The second, and far more decisive, effect of these analogical changes was on the *lexicon*, for here they brought about a substantial reduction in the number of stems exhibiting allomorphy. Thus all the lexical items which went over to the regular pattern automatically lost their irregular alternants and each came to be represented by a single morph throughout its paradigm. In the case of plural formation the nouns which do not take the *-s* suffix are very few (*feet*, *teeth*, *geese*, *mice*, *lice*, *men*, *women*, *oxen*, *children*, *brethren*, *sheep*) while with the verbs the irregular alternants still play quite a prominent role (about 80 in current use). We see that there are thus two facets to analogical change: on the one hand it may have a regularizing effect on the *grammar* by eliminating irregular

[1] There are a few collocations which are sometimes claimed to be unacceptable, *the table's legs* for instance; but other speakers will happily accept *one of the dining room table's legs is loose*.

grammatical alternants or at least decreasing their frequency of occurrence, on the other it reduces the total number of irregular *lexical items* in the language.

One can, however, also look at analogical change from the viewpoint of its effect on *morphological alternation*, that is to say on the number and shape of the allomorphs (or alternants) of individual morphemes in inflectional paradigms and derivational patterns (/ki:p/ ~ /kep-/ in *keep* : *kept*, /gu:t/ ~ /gü:t-/ in *gut* 'good' : *Güte* 'goodness'). Examined in this way all the cases of analogical change discussed so far may be interpreted as instances of analogical *levelling* since they have had the effect of eliminating, or at least reducing, alternation. Thus since its transition to the weak conjugation the verb *to help* has now only a single alternant /help/ whereas previously it had two, which can be represented as /help/ and /h-lp/. Clearly such cases of elimination of alternation in the lexicon have a regularizing effect on the language since verbs which have gone over to the weak conjugation no longer need listing for separate treatment with regard to past tense formation. The same is true with regard to the plural morpheme of nouns. The replacement of *kine* by *cows* has again both increased the incidence of the regular plural morph and eliminated an alternant from the lexicon. Sometimes alternation is not completely eliminated but only reduced, that is the alternants become more alike without however reaching identity. Thus in Early Modern German the word for 'wheel' had the alternants /ra:d-/ and /rat/ while in current German these are /ra:d-/ and /ra:t/ (see p. 90f.).

Analogical change may also, however, increase alternation, in which case one speaks of the analogical *extension* of an alternation beyond its original domain. This is, as a rule, the rarer change of the two. A familiar example is the spread of the so-called 'intrusive *r*' in certain varieties of present-day British English. From lexical items in which there is an alternation between word-final vowel and vowel plus *r* before vowel (for example *hear* /hiə/ ~ *hearing* /hiəriŋ/, *roar* /rɔə/ ~ *roaring* /rɔ:riŋ/, *car* /ka:/ ~ *car of* /ka:-r-əv/), the /r/ has spread to others which previously did not partake in the alternation (for example *saw* /sɔ:/ ~ *saw it* /sɔ:-r-it/, *law* /lɔ:/ ~ *law of* /lɔ:-r-əv/), thus creating alternants with /r/ in the case of words which historically never had an /r/. Another example is the analogical spread in German of the plural marker *-er* accompanied by umlaut of the base from a small nuclear class in which the *-er* was inherited, to a very large number of neuter

nouns the plurals of which were identical with their singulars. Thus, on the model of certain old forms such as *Kalb* 'calf' : *Kälber* 'calves', *Lamm* 'lamb' : *Lämmer* 'lambs', innumerable umlauted plurals in *-er* have been created for such neuter nouns (*Wort* 'word' : *Wörter*, *Buch* 'book' : *Bücher*, *Kraut* 'herb' : *Kräuter* etc.) and even for a small number of masculine nouns (*Mann* 'man' : *Männer*, *Wald* 'forest': *Wälder*, etc.). It will be seen that the affixation of *-er* is always accompanied by redundant umlaut of the stem vowel so that the alternation non-umlauted : umlauted stem has in fact been extended beyond its original domain to lexical items which previously did not have it. This has resulted in an increase in uniformity in so far as plural formation is concerned but also an increase in the frequency of alternation in the lexicon. It might of course be argued that alternation in lexical items has been only slightly increased since many of these nouns already possessed an umlauted alternant for derivational purposes (for example formation of the diminutive, or of an adjective in *-lich* or *-ig*). But whereas it is completely predictable in the case of the plural in *-er*, in the derivational processes the occurrence of umlaut is unpredictable: *Wort* 'word', *Wörtchen* 'little word', *wörtlich* 'literal', but *Holz* 'wood', *Hölzchen* 'little piece of wood', *holzig* 'woody', *Haus* 'house' , *häuslich* 'domestic', *Gast* 'guest' , *gastlich* 'hospitable', *Beruf* 'profession' , *beruflich* 'professional', etc. Since plural formation automatically entails alternation while none of the derivational processes necessarily does, it is more economical to treat each morphological process as having its own alternation rule rather than attempt to give an overall rule for each lexical base. The extension of morphologically redundant alternation is not easy to explain in terms of structural economy. It has however repeatedly been observed, and even tentatively elevated to the status of a principle, that a form which is more fully characterized morphologically tends to be favoured at the expense of one which is less fully characterized (Kuryłowicz 1966).

The fact that we have restricted this discussion largely to inflectional morphology is not without significance. For, although it is true that analogical changes do also occur in derivational morphology they are usually on a rather limited scale. One reason for this lies in the fact that allomorphy is as a rule less clearly defined in derivational morphology, but analogical change presupposes that some specific semantic category be represented by two or more competing exponents. Certain agent nouns in *-er* in German are a case in point. This type has spread at

the expense of an older type, the members of which had become formally unrecognizable as a class as a result of phonological change. The agent noun *Bäcker* 'baker', for instance, can be shown to have replaced an earlier form (which still survives dialectally) *Beck*. On the analogy of word pairs like *fischen* 'to fish' : *Fischer* 'fisher', *graben* 'to dig' : *Gräber* 'digger', *Bäcker* was formed from the verb *backen* 'to bake'. In a parallel way *Trinker* 'drinker', *Geber* 'giver', *Helfer* 'helper' replaced the older functionally equivalent forms *trinko*, *gebo*, *helfo* of Old High German. As a result of this remodelling process and of the continued productivity of the *-er* suffix, agent nouns which are not formed with this suffix are now rare in German.

Reasons for the fact that analogical changes occur less frequently in derivational than in inflectional morphology must in fact be sought in general differences between the two sectors. Thus, while the syntactic rules of a language may demand that for instance every noun and verb inflect for a specific number of grammatical categories, no comparable constraints exist regarding derivational rules – whether a particular derivative will actually occur in the language or not is usually quite unpredictable so that normally all derived forms have to be listed in the lexicon. Furthermore, while the grammatical categories operative in the syntactic rules tend to form relatively small closed classes, the semantic categories involved in the derivation of new lexical items are generally rather numerous, each one often involving only a limited number of bases. To this must be added the fact that, within any given derivational set characterized by a particular formal pattern, the semantic relationship between base and derivative is not in all cases identical. In short, because of their primarily lexical role and their limited participation in syntax, the derivational rules are much less subject to analogical change than the inflectional ones. In fact the two components appear to operate quite independently of one another so that it often occurs that an inherited alternation survives between base and derivative while it is eliminated in the inflectional paradigm. For instance in German /tsuxt/ *Zucht* 'breeding' /x/ before consonant alternates with zero between vowels, as in /'tsi:ən/ *ziehen* 'to breed', but in the inflectional paradigm of *ziehen* the alternation has been levelled: 1. singular /tsi:ə/, 2. /tsi:st/, 3. /tsi:t/ and not */tsixt/, as would be expected before the following consonant. This derivational pattern of nouns in *-t* is, of course, no longer productive.

5.2 *Analogical creation*

While analogical change is the fundamental mechanism whereby the morphological rules in a language are updated, analogical creation is that by means of which the lexical and conceptual resources are renewed. It is a fact that practically all lexical innovation which is not the result of borrowing (see chapter 6) is 'motivated', that is to say formed by rule from existing morphs. The derivation of English adjectives in /-əbl/ (*-able*, *-ible*) may serve to illustrate the way in which such a productive rule may arise. Middle English borrowed from French words like *measurable*, *reasonable*, *acceptable*, *agreeable*, *comfortable*, *profitable*; since their bases without the suffix were also borrowed, either as nouns (*measure*, *reason*) or as verbs (*accept*, *agree*) or as both (*comfort*, *profit*), *-able* could be abstracted as a morph with the function 'fit for . . ., fit for . . . ing, fit to be . . . ed' (Marchand 1960:174ff.). The pattern was to become extremely productive in English, so that adjectives in *-able* are now freely derivable, especially from verbs (*eatable*, *drinkable*, *machine washable*, etc.). It has been suggested that one of the main reasons for the popularity of this pattern is no doubt the fact that it does not entail morphological alternation in the base. More modern examples of analogical creation are the terms for such recently introduced items on the menu as *beefburger*, *cheeseburger*, *eggburger*, *baconburger*, and even simply *burger*, all resulting from a new segmentation and semantic reinterpretation of *hamburger* (in fact from *Hamburg*, and not from *ham*!), and new creations such as *townscape*, *seascape*, *beachscape*, *moonscape*, on the model of the long-established *landscape*.

The distinction between analogical change and analogical creation is in a sense marginal, belonging typically to a corpus-based approach to language in which all attested forms must be analysed and accounted for. If, however, language is considered from its creative aspect which operates with rules in a speaker's competence, the division loses much of its meaning since the same rules which generate existing forms can easily also create new ones. In other words, in a rule-based model of language analogical creation can readily be accounted for, either by reference to existing synchronic rules or to potential rules in the language. New creations like *moonscape* are immediately understood because they are based on a latent rule needed to account for *landscape*.

The cases of analogical formation so far discussed have involved morphologically complex words, and there can be no doubt that inflectional and derivational morphology represent the area of grammar

tooth, *foot*, *mouse*, *man*, *woman*, and verbs like *to be*, *go*, *eat*, *drink*, *will*, *can*, *do*, etc. All these may be said to be members of so-called *basic vocabulary* which would appear to be the sector of language least influenced by cultural change (see chapter 6). Perhaps their stability and resistance to change is due to their very high frequency of occurrence in discourse and to the fact that their forms are therefore acquired by the child at an early stage before the respective grammatical rules have been acquired.[1] All that may be predicted in their case is what would be their likely form were they to undergo analogical change, although there is no means of predicting whether or not such change will in fact ever occur. At the opposite end of the spectrum rare irregular forms may also survive as archaisms in, for instance, poetic or religious registers but not in everyday speech (e.g. *beseech* : *besought*, *thou* : *thine*, *beloved*, *brethren*, etc.).

6 The interdependence of sound change and analogy

After looking at sound change and analogical formation separately we may now examine their essential interrelationship as seen by the neogrammarians in their theory of language development. It will be remembered that we interpreted the two types of diachronic process, sound change and analogical formation, as reflecting the division of linguistic structure into two distinct levels, that of phonology and that of grammar.[2] Thus, while both processes may on the surface bring about the addition, the replacement or the loss of phonological segments both in the spoken chain and in the phonological system,[3]

[1] There appear to be three successive stages: (1) the acquisition of individual past tense forms of verbs; (2) the acquisition of a past tense rule, with 'wrong' generalizations (*goed*, etc.); (3) the adult system (King 1969a: 75, after S. Ervin Tripp).

[2] The distinction at the time would appear to have been rather between the *physiological* mechanism of sound change, apparently beyond the influence of the human will, and *psychologically* motivated analogical processes (cf. Krahe 1970: 13; Paul 1970: 215f.; Best 1973: 30). Explicit statements regarding the relationship between the two principles were not, however, always made.

[3] Analogical change may add new members to a phonological system. A somewhat artificial example is that of the /ɛ:/ (spelled *ä* or *äh*) of Standard German, which is only found in words which have (or were thought by the grammarians to have had) an allomorph with /a:/ (*Mägen*, plural of *Magen* 'stomach'; *Läden*, plural of *Laden* 'shop'; *Nähe* 'nearness', from *nah* 'near'; cf. however *blähen* 'to swell', *Ähre* 'ear of corn', without any such alternant; note that *ä* alternating orthographically with *a* represent-

analogical formation affects phonemes and phoneme sequences only in their role as elements of grammatical structure, whereas phonological change affects them irrespective of their grammatical function. The difference in the nature of the two processes is reflected in the difference between the kinds of rule at the two levels. Phonological rules are regular in the sense that they operate automatically on any input which meets their terms of reference irrespective of the consequences that this may have on grammatical structure. Analogical changes, on the other hand, are totally dependent on the grammatical structure and, even when the rule is clearly statable, whether or not it will be applied in any particular case cannot be predicted – it is only possible to state with reference to a particular analogical change what *would* be the consequences were it to take place. This complementary relationship between the two processes means that grammatical structures rendered opaque, or under the threat of being rendered opaque, by sound change are likely to be 'repaired' by analogical change. Hermann Paul even went so far as to claim that there is no sound change which has not caused at least one subsequent analogical development (1970:202). It is significant that such analogical readjustments always take the form of changes affecting the exponents of specific grammatical or semantic categories (dative, aorist, agent noun, etc.).

It is frequent for an analogical change to give the appearance of suspending or cancelling a sound change in a specific *grammatical* environment. One such instance is that of the 'retention' or perhaps rather the 'restoration' of /s/ in Greek when this had been lost in intervocalic position, as for example in the genitive *géneos* (from *génos* 'kind') when compared with the corresponding forms in Sanskrit (*jánasas*) and Latin (*generis*, with *-r-* from earlier *-s-*). For in spite of this phonological change, in the aorist of vowel-final verbs in Greek the tense marker /s/ is present even though it stands in intervocalic position (*lū̆-ō* 'to loosen', aorist *é-lū-s-a*; *tīmá-ō* 'to esteem', aorist *e-tīmē-s-a*). The

ing short /a/ is a mere spelling convention based on the same principle but does not stand for a separate phoneme; phonemically it represents the same phoneme /ɛ/ as does the spelling *e*). A perhaps more natural example is the case of the development by analogy of a second rounded front vowel in a Swiss German dialect (Moulton 1962); in this dialect the umlauted forms corresponding to bases with both /o/ and /ɔ/ were originally identical (/ö/), with no difference in vowel height, but later a new phoneme /ɔ̈/ was created analogically so that now /o/ alternates with /ö/ and /ɔ/ with /ɔ̈/; see below, p. 128.

retention of the /s/ in the aorist of these verbs is ascribed to the influence of plosive-final verbs like *trép-ō* 'to turn', aorist *é-trep-s-a*; *deík-nū-mi* 'to point', aorist *é-deik-s-a*, in which the /s/ would not have been affected by the phonological change because it was not in intervocalic position. The terms 'retention' and 'restoration' of course describe the phenomena in terms of our rule-based model of description; in the speech community there was presumably co-existence of forms with and without the /s/ until eventually the former was generalized. We shall see the importance of cases of this kind when we come to discuss the attack made on the neogrammarian position by the transformational-generative school (see chapter 3).

7 Phonological reconstruction ('the comparative method')

We have so far limited our discussion of language change and the principles which govern it to documented cases. The fundamental importance of the neogrammarian model lies, however, in the postulate that the same principles which can be verified in documented language history must also be assumed to apply in the case of linguistic pre-history.[1] This generalization makes it possible to explain the partial similarity of the linguistic systems of related languages as resulting from the fact that each represents the continuation, by way of a different channel of transmission, of a single 'initial' linguistic system. And, since related languages have preserved and modified inherited forms and rules in different ways, systematic comparison should allow the recovery of the original system from which they all derive. It is in fact the historical linguist's task to attempt to reconstruct this initial system and to show how the descendant languages have reached their present form. In so far as the Indo-European languages are concerned, Proto-

[1] This claim may appear self-evident today, but it was a major breakthrough at the time (Osthoff and Brugmann 1878). In fact only a few years prior to the neogrammarian manifesto Schleicher, Steinthal and others had divided the development of every language or language family into two basic periods, a period of evolutionary development and a period of decay. Thus the more primitive, or archaic, a language, the richer, more spontaneous and more plentiful its 'organic' structure whereas intellectual activity, culture and civilization destroyed that structure. On this basis Schleicher directly linked the decay of the morphological structure of English with the success of the English people in world history (1869: 35). In the Indo-European family the peak was supposedly reached in the earliest stages of the individual languages, after which there was a continuing process of decay.

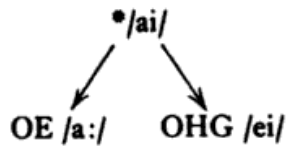
Indo-European, their hypothetical ancestor, represents the system from which all their grammars are, ideally, derivable by rule and it is the ultimate resort to which the synchronic irregularities of any individual Indo-European language can be traced.

Despite the fact that sound change and analogical formation have equal theoretical status in the neogrammarian model of language evolution, there can be no doubt that, of the two, phonological change plays the more important role. The principal reason for this is that analogical formation can account for only a part of the diachronic phenomena at the grammatical level whereas the rules of sound change cover *all* developments at the phonological level. For it must be remembered that analogical formation is essentially restricted to morphologically complex forms whereas the simple lexical morphs, because of the arbitrary nature of the linguistic sign, are restructured only by the phonological rules of the language. It is through these latter, therefore, that historical connections between languages can be most reliably established. The neogrammarian manifesto in fact recommends resort to analogical hypotheses 'only when the sound laws fail' (Osthoff and Brugmann 1878). Clearly, we are here no longer talking about theoretical principles but about practical procedures. Such discovery procedures are, however, important since the historical linguist has no data at his disposal other than the forms and rules of individual languages. It is only by the systematic comparison of these that he can achieve his objective, which is to produce a body of hypothetical protostructures together with rules by means of which the grammars of these languages can be derived from them. In this section we will illustrate the kind of argument which guides procedures and decisions but will not make any attempt to formalize them. Their ultimate justification lies in the fact that the rules arrived at under their guidance relate and explain all the data in the most economical way.

7.1 *Correspondence series and protosegments*

As an illustration of phonological reconstruction let us take an example from the field of Germanic. With very few exceptions, all of which can be accounted for, lexical items containing an /a:/ in Old English have Modern English equivalents with /ou/ (for example *stān* : *stone*, *āc* : *oak*, *hlāf* : *loaf*). This correlation is the result of a sound change whereby Old English /a:/ regularly developed into /ou/ in Modern English. There is, however, also a regular relationship

between Old English /a:/ and Old High German /ei/ (cf. the corresponding Old High German forms ***stein*** 'stone', ***eih*** 'oak', ***leib*** 'loaf') and, because Old English and Old High German were contemporary languages, this obviously cannot be explained in the same way. The regular ***correspondence*** between Old High German /ei/ and Old English /a:/ can, however, be accounted for using the concept of the regularity of sound change if we postulate that the ***common ancestor*** of both English and German had a phonological segment which, through regular sound change, became on the one hand Old English /a:/ and on the other Old High German /ei/. For reasons both of phonetic plausibility and descriptive economy this segment is traditionally represented by /ai/ and, in order to indicate that it is not actually attested but merely postulated, we mark it with an asterisk: */ai/. The development would thus have been:



Of course a ***reconstruction*** such as this must also be as fully compatible as possible with all the other data we possess, such as the reconstructed phonological system as a whole and the rules which govern its previous evolution and further developments. As a general principle we will set up that segment which fulfils all these conditions in the most economical and the most phonetically plausible way.

All that has happened in the above example is that the phoneme of the protolanguage has evolved differently in its phonetic realization in each of the two languages, but in spite of this divergence there is still one-to-one correspondence between its reflexes in ***cognates*** (that is to say in words which are the direct continuation in the two languages of a single lexical item in the protolanguage). But we have seen that a phonetic change affecting a phoneme may sometimes result in its merger with another phoneme so that the opposition which existed between them in the system is lost (see p. 31). In order to show the way in which such a merger may be reconstructed, we will first follow the developments undergone by Old High German /ei/ and Old English /a:/ as recoverable from the actual documentary evidence and then see how far it would have been possible to reconstruct these developments in the absence of all documentation. From historical

(B) occurs in an obstruent cluster, English /st/ : German /ʃt/ initially (7, 8) and /st/ : /st/ medially (9); German /ʃt/ and /st/ are therefore in complementary distribution. It also occurs initially before /r/ (10, 11) and, under unclear conditions, medially in (12, 13). Note however that in (12) it contrasts with (A) in (4), and in (13) it contrasts with (C) in (14, 15).
(C) occurs medially between vowels (14, 15), perhaps also medially in (16, 17), and in final position in (18, 19). In all these positions, however, it contrasts with (A) and (B) (see 5, 6, 13).

The corpus on which these observations are based is of course minimal, but it has been deliberately chosen to be representative of the observable distributional regularities. Starting from the fact of the near-complementary distribution of the three correspondence sets, it is naturally tempting to assume that this reflects an originally complementary distribution of the protosounds underlying them. In that case a reasonable hypothesis would be that English has preserved the older situation and that each of the German reflexes continues one positionally defined allophone of a */t/ phoneme of the common ancestor. This, however, would require that the few instances in which the correspondence sets contrast be shown to be secondary, that is to say the result of phonological changes in the environment subsequent to the protolanguage. Let us therefore consider them in turn.

Judged from the present situation in English and German, items (13) 'bitter' and (15) 'better' appear to indicate identical environments and would thus block the reconstruction of a */t/ for both. We have however seen in (10, 11) that German has /t/ in the environment of a following /r/. This fact provides a possible clue to the resolution of the problem posed by (12, 13). Let us assume that these also originally contained the sequence */tr/ and that this sequence was only later interrupted by a vowel whereas (14, 15) contained a vowel from the start. In this case */t/ in (12, 13) and (14, 15) would originally have been in complementary distribution. If we now compare the environments of /t/ in the corresponding forms of the earliest recorded Germanic language, Gothic, we find the forms *baitrs* 'bitter' and *batiza* 'better'. Ignoring the difference in vowel grade between Gothic *baitrs* and English and German *bitter*, and given that Gothic /z/ regularly corresponds to /r/ in English and German – easily demonstrable from other data – we can now see from the Gothic evidence that the essential difference between the two series of cognates must reside in the earlier

presence of a vowel after the /t/ of (15) but not after that of (13). We may thus postulate an original contrast */-tr-/ : */-tVr-/ not only for the pair *bitter* : *better* but also for *winter* : *water*. After the loss of the endings corresponding to Gothic *-s/-a* had made the */r/ of */-tr-/ word-final a vowel must have been inserted between it and the */t/, thus eliminating the original difference of environment.

We now turn to the problem of (6) as compared with (16, 17). Here the reflex of the */t/ appears in final position in the English examples but in medial position in the German ones and the first matter to be resolved is which of the languages reflects the environment in the protolanguage. It is obvious that either English must have lost the infinitive ending or German have added it, and the historical evidence of Old English with its infinitive forms *sittan, etan, hatian* shows that it is the former which has taken place. The correspondence /t/ : /s/ of (16, 17) is therefore the 'regular' one of (C) as in (14, 15). But this still leaves (6) unaccounted for and we are now faced with the situation that correspondence sets (A) and (C) would appear to have existed in identical environments, that is medially between vowels. We must therefore posit some difference in the environments which has subsequently been lost. Now we can see that the /t/ : /ts/ correspondence in (6) is the same as that of (A) in (3, 4) in which the conditioning environmental factor was that of a preceding consonant. If then a preceding consonant could be shown to have been lost in (6) the problem would be resolved. A clue to the solution is given by the Old English spellings *sittan* 'to sit' as opposed to *etan* 'to eat'; the double *t* would thus appear to represent a long /tt/ counting as a cluster and we may therefore posit a protosegment */tt/ for (6), a supposition which can in fact be confirmed from other evidence. A similar assumption resolves the apparent conflict between (5) and (18, 19), the protoform of (5) again being assumed to have had a long */tt/. This also is in fact verifiable independently.

Having thus established the complementary distribution of the three correspondence sets (A), (B), and (C), we can now see that each of these must represent a different positional allophone of */t/ in the protolanguage. In order to arrive at the situation in present-day German we must assume not only subsequent phonetic changes affecting these but also changes in their environments resulting in an alteration of their phonological status. The following phonetic developments must have taken place: (1) affrication of */t/ in initial position before vowel (1, 2) and medially after */n/, */r/ or in gemination provided that the

group is followed by vowel or pause (3–6); (2) assibilation (that is, the passage to fricative) of */t/ medially between vowels (14–17) and in absolute final position (18, 19); (3) retention of plosion in the clusters */st/ and */tr/ (7–13). At the phonological level we have already seen how [ts] and [s] came to contrast medially and finally as the result of the passage of geminate */tt/ to [ts] and of single */t/ to [s], and how [t] and [s] came to contrast medially due to the insertion of a vowel between /t/ and final /r/. There are in addition, of course, other sources of [t] and [s] in Modern German, with the result that [t], [ts], and [s] now contrast in a great variety of environments. In present-day English */t/ is reflected in the single phoneme /t/. However, as a result of the loss of the contrast between geminate */tt/ and single */t/ and the loss of certain unstressed endings, as well as the insertion as in German of a vowel between /t/ and final /r/, the distributional properties of /t/ differ to some extent from those of */t/ in the protolanguage.

Looking back over these two examples, one of the reconstruction of a merger and one of the reconstruction of a split, it will be seen that the technique employed closely parallels that of synchronic phonemic analysis. Just as in phonemic analysis phonetically similar phones in complementary distribution are subsumed under a single phoneme, so correspondence sets in complementary distribution are subsumed under a single segment (or protophoneme) of the protolanguage. And it is of course the distributional regularities of the protolanguage which are decisive since they determine the phonological status in it of the segment in question.

The term 'reconstruction' for the analytic operations that we have been performing is perhaps somewhat unfortunate since it is liable to lead to a misunderstanding of the nature of what we are doing. Its use stems from a time when it was believed that the methods of historical linguistics did in fact recover the actual linguistic reality of the past. It is harmless enough, however, provided that we see it as no more than a convenient technical term, for the extent of the gap between construct and reality becomes plain enough when we consider the theoretical basis of our operations. In the first place it must be remembered that the segments with which we operate are phonemes which are themselves already abstractions having no existence outside the phones that represent them. Secondly, we are interpreting directly as sound changes phonological correspondences between cognate forms and are behaving as if the postulated diachronic rules were identical with the historical

events which are assumed to underlie them. Thirdly we are, on the basis of the general validity of the regularity principle, choosing the phonetic characteristics of the protosegments in such a way that their reflexes in the descendant languages may be derived from them in the most economical and most phonetically plausible fashion. This means that we simply postulate the minimal possible number of protosegments and such sound changes as do not contradict anything we know about the general processes of phonetic change. Taken together, all these methodological assumptions are bound to add up to a considerable degree of idealization.

7.2 *Diachronic rules: form and order*

The sound changes that we postulate on the basis of phonological correspondences are, like the protosegments, part of the reconstruction process. Ideally, in both their form and their sequence, they are to be considered as representing historical changes which must have taken place in real space and real time. In documented language history successive language states are linked by rules in such a way that the output of each set of rules represents a new state which serves as input to the next set of rules. In most instances, however, owing to the deficiencies of spelling, direct evidence of the actual changes that have taken place and of the new systems that have resulted is lacking. We are then dependent solely on internal evidence. And for prehistoric change it is only the internal evidence that can establish rule order in any case and where such evidence is lacking the changes must be treated as if they had been simultaneous. Limitations on possible rule order are imposed by the formal structure of the data and by the fact that rules have limited validity in time, as well as by the principle of economy of statement. The following example will illustrate the method of reconstruction on the basis of internal evidence as well as its limitations. Note that, although it is taken from a case of documented language history and even though the changes occurred quite recently (within the last seven hundred years), a relative chronology cannot be arrived at from the spelling conventions of the documents and thus relies on internal evidence alone. Let us compare the following Middle High German and Modern German forms:

	'body'	'my'	'loaf'	'stone'	'dear'	'song'
MHG	/li:p/	/mi:n/	/leip/	/stein/	/liep/	/liet/
MdG	/laip/	/main/	/laip/	/ʃtain/	/li:p/	/li:t/

We need at least three diachronic rules in order to arrive at the Modern German forms:

(1) monophthongization (/ie/ > /i:/)
(2) diphthongization (/i:/ > /ai/)
(3) lowering: (/ei/ > /ai/)

Let us apply these rules in the above order and note the output of each:

MHG	/li:p/	/mi:n/	/leip/	/stein/	/liep/	/liet/
(1)					li:p	li:t
(2)	laip	main			**laip	**lait
(3)			laip	stain		
MdG	/laip/	/main/	/laip/	/ʃtain/	**laip	**lait

Clearly, 'dear' and 'song' should not have been put through rule (2) since this produces incorrect forms (indicated by a double asterisk). On the other hand the regularity principle requires that if at a particular language stage there is a rule affecting /i:/ then all /i:/s must be subject to it. By changing the order of application of the rules, however, we are able to avoid the problem:

MHG	/li:p/	/mi:n/	/leip/	/stein/	/liep/	/liet/
(2)	laip	main				
(1)					li:p	li:t
(3)			laip	stain		
MdG	/laip/	/main/	/laip/	/ʃtain/	/li:p/	/li:t/

This new ordering produces the correct forms and is therefore an adequate solution to the problem. We can also see that the rule which changes /ei/ to /ai/ is independent of the monophthongization rule and it does not matter whether it precedes or follows it. The same observation applies in the case of the diphthongization rule – whether we apply (3) before (2), or (2) before (3), we get the same result:

(3)			laip	stain
(2)	laip	main		

or:

(2)	laip	main		
(3)			laip	stain

We could also, however, have obtained the same result by formulating the diphthongization rule differently, namely as (2′) /i:/ > /ei/ and by applying (3) subsequently:

(2′)	leip	mein		
(3)	laip	main	laip	stain

Historical Linguistics is concerned with the process of language change through time. It investigates how and why the language of individuals, a social group or a whole 'speech community' develops in respect of its pronunciation, vocabulary and grammar. Dr Bynon regards language as essentially a dynamic phenomenon, whose character can be at best only partly understood by a static, and necessarily idealized, synchronic approach.

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