Comparative Indo-European Linguistics

An Introduction

Robert S.P. Beekes

Second edition
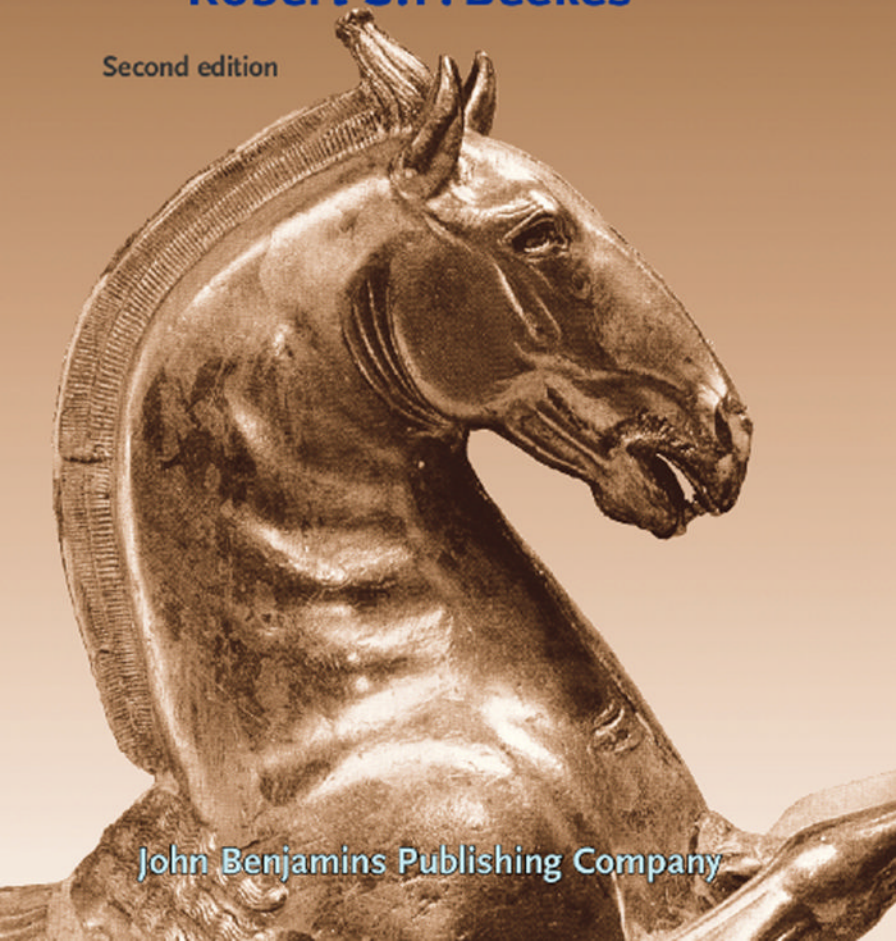
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Revised and corrected by

Michiel de Vaan

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Preface

The Germanic languages, of which English is also a member, are related to many other languages, such as Sanskrit of ancient India, Russian, Irish, Albanian and Armenian. The Gothic word *gasts*, which means 'guest,' is very similar to German *Gast*, while English *guest* is a loan-word from Norwegian. It is related to Latin *hostis*, which means 'enemy.' The explanation for this is that the word originally meant 'stranger' and a stranger was usually considered an enemy. Still, when a stranger crossed the threshold into your home, he had the right to your protection. The Latin word continues to live in the English word *hostile*. In Serbo-Croatian we see it in *gostionica*, 'inn.'

Words such as *cardiology* and *cardiogram* are well-known. They contain the Greek word for 'heart' which also happens to be related to the English word, as well as to Latin *cor*, *cordis* which we know from English *cordial(ity)*.

These are just a few examples of what comparative linguistics has to teach us. This book has been written to explain what comparative linguistics is, what methods it uses and what its current 'state of the art' happens to be. Our own method for explaining this will be by means of illustrations drawn from the whole field of comparative Indo-European linguistics.

The comparative linguistics of the Indo-European languages has been, without doubt, more exhaustively studied than any other. English belongs to this family, and we shall be regularly describing English words. At the same time, though many Greek and Latin words will also be described in this book, readers who have never studied either of these languages will still be able to recognize many of them. Latin, after all, does continue to live on in French (and in Italian, Spanish and so forth). Besides, there are very many loan-words which English has borrowed from Greek and from Latin, especially in the sciences, an example of which we have already seen in *cardiology* and *cardiogram*.

The fascinating thing about comparative linguistics is that such an enormous variety can be traced back to just one common origin. Not less exciting is that research in comparative linguistics takes us to other countries and other times. In this book we shall not only be looking closely at etymology (the history of words), but also at the structure of the Indo-European languages. We will see that developments within languages are often possible to follow down to the smallest details.

Another thing which this book does is to present a survey of the newest insights in the field of Indo-European linguistics. Although this subject has already existed for

two hundred years, it has enjoyed an accelerated development especially in the last decades. New theories are always springing up and new discoveries are continually being made. Some of these discoveries have taken a physical form, as when new inscriptions are found or even new (old) manuscripts, such as the Old Church Slavonic manuscripts which were discovered in the St. Catherine monastery in the Sinai in 1975. But most progress is made because research in one area in one language always sheds light on other areas and other languages.

Comparative linguistics is one enormous floor-puzzle wherein we are continually busy not only finding more and more pieces, but are also becoming increasingly successful in putting them in their proper places, so that the 'great picture' becomes clearer and clearer as we go along. This book gives an interrelated overview of the recent developments which have been made in putting the puzzle together. In fact, it presents the first systematic treatment of the whole Indo-European family of languages which has ever been published in English.

The book consists of two parts, the first of which is general in nature. Here, after a short introduction, the Indo-European languages are described, after which a chapter follows on the culture and the origin of the speakers of the common language from which the whole Indo-European group is derived. This is followed by a general introduction to the subject of language-change in which various changes of sound, form, vocabulary and sentence structure are all dealt with one by one. In each case, an attempt is made to illustrate by means of examples in the hope that these will speak for themselves. My hope is that the reader hereby will slowly but surely begin to feel more and more comfortable with the material being presented. Among the examples are some of the more complicated ones, too, because a first introduction may not create the impression that everything to follow is going to be equally easy. In the last two chapters I try to show how comparative linguists, using their expert knowledge of language-change, go about their work, how they use language to reconstruct the history of language.

The second part of this book is a systematic description of the results which a comparison of the Indo-European languages has so far provided us with. Here we do not give examples, but rather a full and complete description of the structure of the languages in the Indo-European family.

At the end of the book the reader will find an appendix containing a.) a survey of the sound developments in Albanian; b.) a short chapter on phonetics; c.) a list explaining the technical terms which I have used throughout; d.) a bibliography (with a general Section and another (I.) on special problems). The book contains a number of illustrations with examples from different languages, as well as some relevant maps. Finally, an index has been included which makes it possible to locate words either according to their meaning or to their form.

This book is a revision of the original book, *Vergelijkende taalwetenschap*, which was published in 1990 by Het Spectrum (Aula paperback), in Utrecht, the Netherlands. It was written in a direct everyday-dutch; it was intended that this character is preserved in the translation, which was made by Paul Gabriner. It contains a large number of additions and corrections. Sections 3.3 and 3.4 were largely rewritten after Mallory's book on the origin of the Indo-Europeans was published.

I wish to thank my colleagues F.H.H. Kortlandt, A. Lubotsky, J.J.S. Weitenberg and P. Schrijver and other colleagues of the Institute for Descriptive and Comparative Linguistics of Leiden University for their helpful remarks and in general their immensely stimulating cooperation and their personal friendship. I am indebted to my Leiden colleague, Dr. Rolf H. Bremmer, from the English Department, who wrote Section 11.11 which treats the sound changes from Proto-Indo-European to modern English. For the appendix on Albanian I am much obliged to Dr. Bardhyl Demiraj, from Tirana, who worked in Leiden on his etymological dictionary of Albanian, and our project of making a new general etymological dictionary of Indo-European, a 'new Pokorny'. It goes without saying that the results as here published are no one's responsibility but my own, and that, considering the vast nature of the subject, mistakes are almost inevitable. Much remains that is uncertain and, therefore, also open to differences of opinion.

The John Benjamins Company/ The editor prepared the book with much care. I give my thanks especially to Mrs. Y. de Lusenet for her cooperation.

I want to thank Mrs. drs. Geke Linker for reading the proofs of this complicated text.

<div align="right">Robert S.P. Beekes</div>

Preface to the Second Edition

The first edition of this book was both acclaimed and heavily criticized, sometimes by the same reviewer in the same review. A list of reviews of the first edition is provided at the end of the bibliography. The critics rightly saw that the book has a twofold character: on the one hand, it seeks to provide a general introduction to language reconstruction, on the other hand, it wants to present a full picture of the way Proto-Indo-European should be reconstructed according to the author. As a result the presentation of both themes is often very succinct, to the point that it can be hard for beginners to understand what the author means. Another point of criticism was the particular brand of Indo-European reconstruction, the so-called "Leiden school", and the fact that the author does not provide references for many claims which deviate from the received opinion of 1995. Furthermore, the English translation of Beekes' Dutch original from 1990 betrays a lack of understanding of the topic on behalf of the translator. This explains many un-English formulations and some real missers. Finally, the first edition contains a high number of printing errors,

Since 1995, a significant number of introductions to Indo-European has appeared, including two in English. None of them, however, are similar in character or ideas to Beekes' text, which is why a second edition is justified. As the main competitors on the market I regard Meier-Brügger (2010) and Fortson (2004), see further in the bibliography.

The main aims of this second edition are to remedy the typos and translation errors of the first, to add some explanations to really difficult passages of the original, and to add exercises so as to enable students to practise the reconstruction of PIE. Exercises have been added for Chapters 11 to 18, and the solutions are given in the appendix. Many of these exercises have been used by myself and other colleagues in introductions to Indo-European taught in Leiden, but I have also added some new ones in order to achieve a more balanced distribution across the different chapters. I expect that the exercises will be fruitful particularly in combination with expert teaching. Teachers can easily adapt the solutions to fit their own view of PIE reconstruction.

A mere subsidiary aim of this edition is the modernization of the contents — after all, Indo-European studies has progressed in the past 15 years — and the bibliography. In order to fully modernize and rewrite the text, as would have been possible in many places, I would have needed much more time. For instance, I have refrained from adding a chapter on the reconstruction of PIE syntax.

Some elements have been changed more thoroughly. I have taken the liberty to remove the appendix on Albanian, as similar overviews have appeared elsewhere in the last couple of years. Some of the main phonological developments of Albanian appear in the surveys in Chapter 11. I have also removed Section 1.3 of the original (about linguistic disciplines) and 2.3.2 (about Bangani). I have rewritten Sections 2.4–2.7, 4.5, 4.8 and 8.4 of the general part. I have furthermore moved 10.4 (about the PIE velars) of the original book to Chapter 11 (on PIE phonology), and 10.5 (on *n*-stems) to Chapter 13 (on morphology), since the original placement implied a lot of browsing back and forth in the book. Instead I have added two different case studies to Chapter 10 (10.2 and 10.4). Section 11.3 has been integrated into 11.9 of the original, and Chapter 12 slightly reorganized. I have added paragraphs on Marcus van Boxhorn to Section 2.1, on the Germanic sound shifts to Section 11.3.8, and on vrddhi derivatives and on internal derivation to Section 13.1. The Hittite material has been updated to include the most recent developments (Kloekhorst 2008). At the very end I have added Schleicher's Fable in the oldest version and the most recent one. The bibliography has been extended and reorganized.

The reviewers' complaint about the lack of references cannot be resolved. To add references to all the claims made would take up a lot of space and it would also reduce the primarily didactic character of the book. All main ideas about the way PIE is to be reconstructed according to the Leiden school can be found in Section III.2 of the bibliography. For all purposes, then, those may be regarded as the main references.

Many people have assisted in the preparation of this edition. Many students have unwittingly provided assistance by testing the exercises, both our regular BA and MA students and the international participants in various Leiden Summer Schools in IE linguistics. Sean Vrieland (Leiden) has corrected the English spelling of the original. My colleagues Alwin Kloekhorst, Frederik Kortlandt and Alexander Lubotsky have helped me reformulate bits and pieces of the original text and add some new features. Eithne Carlin (native American languages), Maarten Kossmann (African languages) Leonid Kulikov (Indo-Aryan), Hrach Martirosyan (Armenian), and Michaël Peyrot (Tocharian) have contributed to the bibliography. I thank the John Benjamins Publishing Company for providing us with the opportunity for this second edition; the editor, Anke de Looper, has made the editorial process easier in various ways. Finally, I am very grateful to Robert Beekes for giving me carte blanche in changing his original text.

Leiden, April 2011
Michiel de Vaan

List of Abbreviations

Languages

Aeol.	Aeolic		M	Middle-
Alb.	Albanian		MCo(rn).	Middle Cornish
Arm.	Armenian		MLG	Middle Low German
Att.	Attic		MW	Middle Welsh
Av.	Avestan		Myc.	Mycenaean
Bl.	Baltic		NHG	New High German
Boeot.	Boeotian		O	Old-
Bret.	Breton		OAtt.	Old Attic
BSl.	Balto-Slavic		OAv.	Old Avestan
Corn.	Cornish		OCS	Old Church Slavonic
Cret.	Cretan		OE	Old English
Dor.	Doric		OFri.	Old Frisian
Du.	Dutch		OHG	Old High German
E.	English		OIc.	Old Icelandic
Fr.	French		OIr.	Old Irish
Fri.	Frisian		OLat.	Old Latin
G.	German		OLith.	Old Lithuanian
Gaul.	Gaulish		OLFr.	Old Low Franconian
Gmc.	Germanic		ON	Old Norse
Goth.	Gothic		OP	Old Persian
Gr.	Greek		OPr.	Old Prusssian
Hebr.	Hebrew		ORuss.	Old Russian
Hitt.	Hittite		OS	Old Saxon
Hom.	Homeric Greek		Osc.	Oscan
IE	Indo-European		Osset.	Ossetic
IIr.	Indo-Iranian		OW	Old Welsh
Ill.	Illyrian		P	Proto-
Ion.	Ionian		Pamph.	Pamphylian
Ital.	Italic		PBl.	Proto-Baltic
Lat.	Latin		PCl.	Proto-Celtic
Latv.	Latvian		PGmc.	Proto-Germanic
Lesb.	Lesbian		Phr.	Phrygian
Lith.	Lithuanian		PIE	Proto-Indo-European
Luw.	Luwian		PII	Proto-Indo-Iranian
Lyc.	Lycian		PIr.	Proto-Iranian
Lyd.	Lydian		PIt.	Proto-Italic

PToch.	Proto-Tocharian	Thrac.	Thracian
Russ.	Russian	Toch.	Tocharian
SCr.	Serbo-Croatian	Umbr.	Umbrian
Skt.	Sanskrit	Ven.	Venetic
Sl(av).	Slavic	W.	Welsh
Slov.	Slovenian	YAv.	Young Avestan

Other abbreviations

abl.	ablative	med.	medium, middle
acc.	accusative	nom.	nominative
act.	active	n(tr).	neuter
adj.	adjective	opt.	optative
adv.	adverb	pass.	passive
anal.	analogy, analogically	pf.	perfect
aor.	aorist	pl.	plural (1 pl., 2 pl., 3 pl. = 1st, 2nd, 3rd person plural)
AP	accent paradigm		
cf.	compare	ppf.	pluperfect
cons.	consonant	pr(es).	present tense
dat.	dative	pret.	preterite
dem.	demonstrative	ptc.	participle
du.	dual	RV	Rigveda
f(em).	feminine	sg.	singular (1 sg., 2 sg., 3 sg. = 1st, 2nd, 3rd person singular)
fut.	future		
gen.	genitive	subj.	subjunctive
ib(id).	in the same place	subst.	substantive
id.	idem	trans.	transitive
ill.	illustration	vb.	verb
imf.	imperfect	voc.	vocative
imp.	imperative		
ind.	indicative	>	becomes
inf.	infinitive	<	derives from
inj.	injunctive	*	(before a word) reconstructed form
ins(tr).	instrumental case	¯	long vowel
intrans.	intransitive	˘	short vowel
loc.	locative	Ø	zero
m(asc).	masculine		

Transcription

The Indo-European languages are transcribed in this book in the Latin alphabet. But the reader must know which sound is represented by which character in a given language, for this can change from language to language. For the sounds, see further the Phonetics section and the Explanatory List of Words in the **Appendix**. (Note that in this book the vowels *a*, *e*, *i* have the same value as in the continental languages, i.e., as in *card*, *bait*, *see*, respectively.)

Sanskrit: *ṭ* etc. are retroflexes; *c* = [*tš*], *j* = [*dž*]; *ś* (formerly *ç*) = *š; -ḥ* is a voiceless *h*; *ṛ* is vocalic *r; ṃ* or *ṁ*: nasalization of the preceding vowel. *e* and *o* are long vowels, *ai* and *au* are long diphthongs.

Avestan: *ą* nasalized *a*; *ā̊* as in *broad*, *x* as *ch* in Scottish *Loch*, *ϑ* = [*ϑ*]; *β, δ, γ* voiced fricatives; *c, j* (formerly *č, ǰ*) as in Sanskrit; *ń, ń̦, x́* palatalized *n*, *ŋ*, *x*; *-ṭ* is an unreleased (i.e., the first part of) *t; y* and *v* are written *ii* and *uu* word-internally.

Old Persian: *c, j*, see Sanskrit; *ϑ* also *þ* = [*ϑ*]; *x* (also *ḫ*) as in Avestan; *ç* maybe as Czech *ř*.

Old Church Slavonic: *ě* = [*ɛ*]; *ę, ǫ* nasalized *e, o*; *ь, ъ* as in *pit, cut*; *c* = [*t͡s*], *č* = [*t͡š*], *x* see Avestan.

Lithuanian: *ė* long, closed *e*; *ę, ą*, long *æ, a*; *y* = *ī*; *ie* formerly *ë*, *uo* formerly *ů*; *š* formerly *sz*, *č* formerly *cz*.

Armenian: *pʿ* etc. = [*pʰ*]; *c* = [*ts*], *j* = [*dz*], *cʿ* = [*tsʰ*] (formerly *ç*), *č* = [*tš*], *ǰ* = [*dž*], *čʿ* = [*tsʰ*] (formerly *çᶜ*); *r̄* = *rr* (formerly *ṙ*).

Albanian: *ë* = [*ə*], *y* = [*ü*]; *th* = [*ϑ*], *dh* = [*δ*]; *c* = [*ts*], *x* = [*dz*]; *ç* = [*tš*], *xh* = [*dz*]; *q* = [*c*], a voiceless palato-alveolar stop, *gj* = its voiced counterpart.

Hittite: *s* also written *š*; *z* = [*ts*]; *h* also *ḫ* = [*x*].

Tocharian: *a* = [*ə*], *ā* = [*a*], *ä* = [*ɪ*]; further as Sanskrit.

Old Irish: *c* = [*k*], *á* etc. long *a*; *iC* = *Cʸ* (palatalized consonant).

Welsh: *ll* is a voiceless fricative *l* whereby air escapes on one side.

Gothic: *ei* = *ī*; *ai, au* (also *aí, aú*) = [*ɛ, ɔ*] before *r, h, hw*; *hw* = [*xʷ*].

List of Exercises

Part I

General section

Chapter 1

Introduction

1.1   Historical and comparative linguistics

Language changes. Words become old-fashioned and are replaced (*yonder > there*), forms are replaced by other forms (*thee > you*), etc. Present-day written forms of words often betray an earlier stage. For instance, in *night*, the *gh* is no longer pronounced, but it once indicated a real sound; cf. G. *Nacht*, where the corresponding *ch* is still fully pronounced. This sound goes back to the *k* of Lat. *nox*, *noct-is*. Old English is a different language altogether from the modern English that we know, and very difficult for the non-specialist: the forms are different, the words sometimes have another meaning, their order is not always the same as it is now, and so forth. We call the study of how languages change 'historical linguistics'.

The course which changes in language will take cannot be predicted, but in retrospect we are (often) able to trace how linguistic changes have occurred in the past. It *is* possible to follow the English of today back to Old English, for example. Thus, whoever studies the history of a language, such as English, is doing historical linguistics. Old English itself does not lead us back beyond the seventh century AD: further 'progress' backward is only possible if we compare English with other cognate languages.

1.2   Comparative linguistics

English is related to German and Dutch, as well as to Danish and Swedish, though more distantly. And Latin? Is Latin *pater* ('father') related to the English *father*? Is the English word *borrowed* directly from Latin? In the case of the word for 'father', borrowing is not very probable. In Ancient Greek the word was *patḗr*. Meaning and form (both are essential) are so similar that coincidence can be eliminated as an explanation. If borrowing is also eliminated, the similarity can only be explained by positing the existence of a common ancestor.

Languages usually have dialects, which is due to the fact that changes do not always affect entire language communities equally. Indeed, dialect differences can grow so great that we may, or must, eventually speak of different languages. Just when a dialect becomes a distinct language depends on the kind of definition being applied, but is not very interesting from a linguistic point of view. 'Dialect' and 'language' are

social tags, but there is no linguistic way to decide what the difference is between a dialect and a language. Through dialectal variation, a language can split up into one or more different languages. The best-known example of this is the process which gave rise to the Romance languages (such as French, Italian, Spanish, Portuguese and Rumanian), all of which derive from a common ancestor, Latin. In the same way English, Dutch and German also come out of an earlier language. Even though this earlier language has not come down to us, we can (partly) reconstruct it, and when we do so we speak of a proto-language; in this case, of Proto-Germanic.

We say that languages are related to each other when they are all derived from one common ancestor. 'Comparative linguistics' is the term we use to describe the study of the relationships which exist between such cognate languages. It is thus a form of historical linguistics, though historical linguistics is not always necessarily comparative in nature.

In order to describe the relationship between cognate languages we need to reconstruct the common ancestor from which the languages to be studied are derived. As we have already seen, a reconstructed language of this kind is called a proto-language. Proto-Germanic is the reconstructed common ancestor out of which developed all the different Germanic languages we know today. For all of the Indo-European languages taken together, a reconstructed language called Proto-Indo-European has been worked out. An exact description of the relationship between any two Indo-European languages, Old English and Old High German, for example, can only be done with reference to the original proto-language, in this case via Proto-Germanic. It is Proto-Indo-European which lies behind Proto-Germanic, Proto-Italic, Proto-Greek and so forth:

```
                           Proto-Indo-European
        ┌──────────────────────────┬──────────────────────────┐
   Proto-Germanic               Proto-Italic               Proto-Greek
   ┌──────┴──────┐              ┌────┴────┐                     │
Old English  Old High German   Latin                      Ancient Greek
```
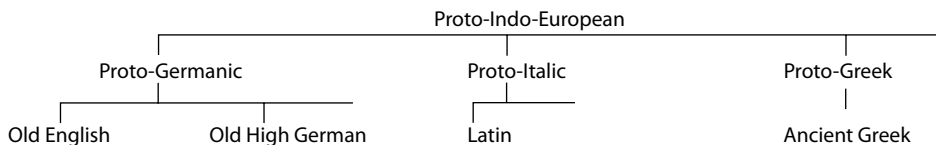
The reconstruction of a proto-language and its proto-forms is thus a basic and necessary tool for the comparative linguist.

There is a difference of opinion as to the status of such proto-forms. Some consider them to be realities, whereas others view them only as handy formulae for making the nature of the relationship between cognate languages clear. In my opinion there is no real problem here: the proto-forms are intended to represent realities, that is, to represent linguistic forms which were once actually spoken; but our insight is limited, and the reality might have been different from what we imagine.

Comparative linguistics came into existence through the study of the Indo-European languages, as we shall see in Section 2.1 below. The comparison is also the most

fully developed in this family of languages. It is for this reason that this book will limit itself to Indo-European. English, as has already been stated, is a member of this great family.

Because comparative linguistics studies the way languages change, Chapters 4 to 8 will be devoted to exploring how this process takes place. How comparative linguistics actually goes about its business will be the subject of Chapters 9 and 10, where a number of examples will be presented by means of illustration. The second part of this book (Chapters 11 to 18) shows comparative linguistics at work in its systematic description of the whole Indo-European family of languages.

1.3   The language families of the world

In this book we propose to limit ourselves to an examination of the Indo-European family of languages. Of course there are many other families of languages as well as individual languages which no longer belong to a language family, or whose relationship to other languages is unclear. Here is a short survey of the language families and the languages of the world.

1.3.1   The Old World

1. The AFROASIATIC family. This large family includes the Semitic languages and many languages of Africa.

(a) The *Semitic languages* include Northeast Semitic: Akkadian, which in turn includes Babylonian and Assyrian, and which we know from inscriptions in cuneiform writing. Through recent finds at Ebla in Syria we know this language already from 3200 B.C.

Northwest Semitic is Hebrew, the language of the Old Testament, which was given a whole new lease on life at the end of the 19th century and is now the language of modern Israel ('Ivrit'); then there is Aramaic (the language which Jesus spoke), and the Phoenician of Lebanon, which was also conveyed to Carthage, where it became known as Punic.

Southwest Semitic is Arabic, which Islam carried as far as Spain and Iraq (Egyptian, Moroccan, and so forth are dialects of Arabic, as is Maltese), and the languages of Ethiopia, which are Amharic, Tigre, Tigrinya, Harari and Gurage.

(b) *Old Egyptian* forms a distinct branch of its own. Coptic, which only survives as a liturgic language, is a continuation of it.

(c) The *Berber languages* are the original languages of North Africa, before Arabic came there. Tuareg is one of them.

(d) The *Cushitic* languages spoken in the horn of Africa, such as Somali and Oromo, and

(e) The *Chadic* languages (nearly a hundred), among which Hausa, an important language of Nigeria, Niger and many other countries.

(f) The *Omotic* languages, spoken in southern Ethiopia.

The other languages of Africa make up two large families and one small one.

2. The NILO-SAHARAN family is spoken in Sudan, Ethiopia, Uganda, Kenya and Chad. The *Nubian* languages belong to it, as do the *Nilotic* languages, such as Dinka, Nuer, Shilluk and Turkana.

3. The largest family is the NIGER-KORDOFANIAN, which covers an area from Senegal to South Africa. This family is divided into six groups, one of which is *Benue-Congo*, in which the *Bantu* languages form the largest group. Among these are Kikuyu, Rwanda, Zulu and Swahili, the last being the most widely spoken language in East Africa.

4. The KHOISAN languages are spoken in southern Africa, especially in South Africa, Botswana and Namibia. Many researchers doubt the genetic unity of this alleged group. These languages have been largely squeezed out due to the advance southwards of the Bantu and the northward advance of white settlers in South Africa.

5. In Eurasia we have the FINNO-UGRIC family, which, together with the Samoyedic languages in Northwest Siberia, forms URALIC. To the *Finnish* group belong, apart from Finnish itself, Estonian and the Saami languages, the Volga languages and the Permian languages. *Ugric* consists of two languages on the Ob and of Hungarian, which came to Europe in the ninth century A.D. The comparative linguistics of this family is just as old as that of the Indo-European group, but these languages only began to be recorded much more recently.

6. ALTAIC consists of five groups:

(a) The *Turkish* languages in West and Central Asia, such as Uzbek and Tatar: (Osmanli) Turkic came into Turkey itself in the (eleventh to) fourteenth centuries.

(b) About ten *Mongolian* languages.

(c) The *Manchu-Tungusic* languages of Eastern Siberia. Manchu was, until 1912, the official language of the civil service in China.

(d) *Korean*, and

(e) *Japanese.*

Whether or not the last two do indeed belong with the others is a question still under discussion, but it now seems probable that they do.

It has long been thought likely that the Uralic and Altaic groups must be related, for which reason the term URAL-ALTAIC has been coined.

7. In the Caucasus we find three families of languages, but it is uncertain whether they are related: *South Caucasian* includes Georgian, *West Caucasian* includes among other languages Circassian and *East Caucasian* is the language spoken by the Avars, amongst other peoples.

8. In the south of India DRAVIDIAN languages are spoken, of which Tamil and Telugu are the best known.

9. The SINO-TIBETAN family comprises *Chinese*, or better, the Chinese languages (such as Cantonese), and the *Tibeto-Burman* group. This last group includes many of the languages spoken in Tibet (such as Tibetan), Assam and Burma (Burmese).

10. AUSTRO-ASIATIC comprises a group of related languages which are found between Eastern India and Vietnam. Among these are the *Munda* languages of Eastern India, the *Mon-Khmer* languages (for example, Cambodian), *Viet-Muong*, among which Vietnamese itself, and the *Asli* languages spoken on Malacca.

11. To the AUSTRO-THAI group belongs *Tai-Kadai* (among which Thai itself) and the AUSTRONESIAN (or Malay-Polynesian) family. This last group of languages is an enormous family. Among them are Malagasy, spoken on Madagascar, languages spoken in Vietnam, most of the languages of Indonesia, such as Javanese and Malay, the native languages of the Philippines (for example, Tagalog) and of Taiwan; in addition to these we may include the languages of Melanesia, Micronesia and Polynesia (for example, Samoan and Tahitian, and the Maori language of New Zealand).

12. The PAPUAN languages of New Guinea (some 700 of them) do not make up one family.

13. Perhaps the indigenous languages of AUSTRALIA do form one family. There are more than a hundred of them, of which Aranda is the best known.

14. A number of isolated languages which have lost all relations with other languages and groups must be listed.

In Europe, there is first of all *Basque*. Almost without exception, all the languages of Europe which have survived are Indo-European languages: the exceptions are Finnish, Estonian, Hungarian and Basque, which is spoken by the Basque people of the inaccessible Pyrenees region of northern Spain.

In Kashmir, *Burushaski* is similarly isolated, and in Japan the same is the case for the language of the *Ainu* people.

Siberia has a number of isolated languages, such as *Ket* (though this has recently been connected with the Athabaskan family in North-America). Other languages are ranged together under the label *Paleo-Siberian* languages, which are now supposed to form one family, which is called *Chukchee-Kamchatkan*.

There are also a number of languages from antiquity which are not known to be related to any other languages: *Sumerian*; *Elamitic* in Persia; *Hurrian* was related to *Urartaean* in the ninth to seventh centuries before Christ in the area of Lake Van in Eastern Turkey; *Hattic* in Central Turkey; *Eteocyprian* and *Eteocretan*; *Etruscan*, which came from Asia Minor; and *Pictish* in Scotland.

1.3.2 The New World

The Americas were populated during the Ice Age from Asia via the then dry Bering Straits, or via a sea route along the coasts of Siberia and Alaska. The time of the original migration (as long ago as 40,000 years or as recently as 12,000 years ago) is still being disputed. However, no evidence of a relationship between the native languages of the Americas and those of Asia has been produced. The Indian languages of the Americas do not form one large group. Indeed, the number of language families in the New World is exceptionally large.

Joseph Greenberg has divided the languages of the New World into three families: (1) the *Eskimo-Aleutic* family, which comprises the languages of the Aleuts and of the Eskimos (the Inuit); (2) the *Na-Dene* family in the north and west of North America which comprises the Haida, Tlingit, Eyak and Athabaskan languages (including Navaho, the largest Indian language of North America); and (3) the *Amerindian* family of languages, to which belong all languages of Middle and South America and, presumably, all the rest of the languages of North America. Haida excepted, the positions of Eskimo-Aleutic and the Na-Dene languages, both of which are thought to be the products of relatively recent waves of immigration, are not disputed. However, this is not the case with the third group, the Amerindian languages, the existence of which is not even accepted by the majority of linguists.

The languages of the so-called Amerindian group in North and Middle America, taken together, make up more than sixty families. Sapir's classification of them, which dates from 1929, is still valid. Except for the Eskimo-Aleutic and Na-Dene languages, referred to above, the Sapir classification consists (with some additions made by others) of the following superfamilies: (1) *Algonquin-Wakashan*: the Algonquin languages in the middle and east of North America (among which Cree, Ojibwa, Cheyenne and Blackfoot), the Salic languages and the Wakash languages in British Columbia and the northwest of the United States; (2) *Macro-Penuti*: a large number of languages of the west coast of North America (among which Tsimshian, Chinook, Klamath, Yokuts and Miwok), Totonac, the Maya languages and the Mixe-Zoque languages in Mexico; (3) *Aztec-Tanoan*: a part of the languages of the Pueblo Indians and the *Uto-Aztec* family of languages, which comprises a large number of languages in California and the western interior of the United States (among which Comanche, Hopi, Paiute, and Shoshone), most of the languages of Northwest Mexico and *Nahuatl*, the language of

the Aztecs; (4) *Hokal-Sioux*: a very large number of languages in California, Mexico, Central America and the Midwest and the Southeast of North America (among which Cherokee, Iroquois, Lakhota (Sioux), Creek and Choctaw); (5) *Macro-Oto-Mangue*: complex tone languages which are spoken in the Central Highlands of Mexico (Oto-mi, Mazatec, Mixtec, Zapotec, with small infiltrations in Central America); and, (6) *Tarascan*: a genetically isolated language in the west of Mexico. Parts of Sapir's classification, particularly his Group 4 (*Hokal-Sioux*), however, are rejected today.

Within the Amerindian group as defined by Greenberg the diversity is greatest in South America (including the Caribbean area, where no less than 118 families and genetically isolated languages have been identified). This number can probably be reduced to about 90, because different families in the east of South America have been brought together within the *Macro-Gê* group. Other large families are the *Arawak* languages, the *Caribbean* languages, the *Chibcha* languages and the *Tupi* languages (to which Guarani, spoken in Paraguay, belongs). Some of the most important indigenous languages in South America are genetically independent: *Quechua*, the language of the Incas, with around 8.5 million speakers in Argentina, Bolivia, Ecuador and Peru; *Aymara*, with around 2 million speakers in Bolivia, Chili and Peru; and *Mapuche* in Argentina and Chili.

The factual reality which Greenberg attaches to the Amerindian languages as a family can hardly be credited, considering the great age at which they began to diverge from each other. This is why linguists are looking for traits which are typical of the Amerindian languages as a group, when contrasted with the languages of the rest of the world. The similarities in the pronominal system of a large number of these languages are very promising for the comparison.

However, we have already indicated that our purpose in this book is to limit our investigations to that family of languages of which English is a member, the Indo-European family, which is spoken by about 50% of the world's population (the second position is held by the Sino-Tibetan family, and its 25% of the world's population is largely owing to Chinese). The Indo-European family happens to be the best-studied, and comparative linguistics has so far been able to produce very good results working within it, partly because its extensive declension systems (inflection and conjugation) make it very fruitful ground for comparative linguistic scholarship.

Chapter 2

The Indo-European Family of Languages

2.1   The genesis of comparative linguistics

Comparative linguistics began to develop very late, only shortly before 1800, when Sanskrit (Old Indo-Aryan) became known in Europe and comparative Indo-European linguistics came into being.

It may seem strange that the science of comparing languages did not develop earlier, since both the ancient Greeks and the inhabitants of ancient India paid serious attention to linguistic matters in the study of their respective literatures. A number of reasons may be offered to explain the late rise of comparative linguistics. The first reason is that the Greeks (to which we will limit ourselves for the moment) were insufficiently familiar with other languages. The differences between the various Greek dialects (Ionic, Attic, Doric, Aeolic) and the differences between the older and more recent texts were apparently too minor to provide the necessary stimulus for the development of the idea of the historical development of language and the genetic relationship of languages. The Greeks were hardly interested in other languages such as Persian, Phrygian or Thracian. What interest they did exhibit was limited to a few 'glosses', explanations of individual words, such as that 'skin' in Thracian was called *zalmos*. The Romans, of course, were familiar with Greek, and the idea existed that Latin had somehow derived from it. So there was at least some basis upon which a comparative linguistics could have developed. The second reason, already mentioned, is that people had no idea that languages actually change and develop through time. Whenever change was noticed, it was called 'decay'. The third reason is that the notion of analyzing words never occurred to the Greeks, something which was well advanced in India. This fact, together with a lack of insight into how sounds of a language change, led them to propose the most arbitrary 'etymologies'. A good example of this is the derivation of the Latin word *fenestra*, 'opening in a wall, window,' as *feret nos extra*, 'it carries us out (of the house),' so from *fe-n-extra*. The meaning which is assumed is, of course, nonsensical, and the supposed contraction of three words (among which 'us') into one word, together with the assumed reduction of sounds, is almost without parallel anywhere (words of the 'Jack-in-the-box' variety are quite rare).

The Middle Ages provided more knowledge of other languages, and thus increased the possibility of the eventual development of comparative linguistics. Christianity spread across Europe because it was willing to learn and use the existing languages

of many different peoples; and it was not long before religious and later secular literature followed in the wake of the many translations of the Bible that were made at that time. It is for this reason that our knowledge of Gothic, Irish, Armenian and Old Church Slavonic is based, in the first instance, on Christian texts. The spread of writing meant that a number of languages were written down for the first time, which makes linguistic research possible. Valuable descriptions of languages were made by their own speakers, such as the grammatical records in and about Old Icelandic which have come down to us.

The sixteenth and seventeenth centuries saw an advance in this regard. The invention of printing made the study of language much easier, and the number of languages which people knew began to increase. Inventories of the various languages known began to be recorded at this time. Such an overview, entitled *Mithridates* (after the king of Pontus, in the north of Turkey, who was said to have been conversant in twenty-five languages a century before the birth of Christ), was published in 1555 by the Swiss scholar, Gesner, in which twenty-five languages were ranged next to each other. But scholars did not yet see the way in which such a survey could be really useful. In 1599 the Leiden scholar, Scaliger, one of the great learned men of his time, divided the languages of Europe into eleven groups, among which Greek, Latin, the Germanic languages and the Slavic languages, but he denied that any relation existed between these groups. Whenever scholars sought for unity, they did so by assuming that one language must have been the original out of which the others grew. Usually, the language so honored by this assumption was Hebrew, a choice that was not made on purely linguistic grounds. A notorious example of this tendency was the Dutchman, Goropius Becanus, who argued that his own language, Dutch, was the fountainhead from which all others sprang.

The first truly comparative stance was taken by Marcus van Boxhorn, a Leiden scholar who in the middle of the seventeenth century compared Latin, Greek, Germanic, Slavic, Baltic, Persian and Sanskrit, and suggested that they all sprang from one and the same source. This source language he called Scythian on the basis of Herodotus' description of the inhabitants of the Eastern European and Central Asian steppes. Van Boxhorn stressed that only systematic correspondences between languages, in particular in their morphology, could prove their descent from a common origin.

Throughout the eighteenth century, language knowledge was on the increase, not only in the breadth but also in matters of accuracy. Lhuyd, for example, described the then still living Celtic languages in 1707, and his work remains valuable to this day. Catherine II of Russia commissioned a work which surveyed and collected samples from two hundred languages in Europe and Asia (1786–87). More significant is the fact that the study of different languages was now put upon a systematic footing, so that comparisons of a meaningful kind could begin to be made. Scholars no longer

limited themselves to bits and fragments, chance gleanings and so forth. They began to realize that etymologies of individual words, important as they were, were not more important than the accurate description of the grammatical system of a language. They began to understand the need to look more closely at such matters as inflection, pronouns, etc. A decisive breakthrough was the discovery of Sanskrit, which was evidently somehow related to Greek and Latin, and which provided the foundation upon which comparative Indo-European linguistics could be erected.

2.2   The discovery of the Indo-European family of languages

The idea of an 'Indo-European' family of languages grew out of the discovery that the oldest language of the Indian subcontinent, Sanskrit, was related to the European languages. The discovery of Sanskrit provided the key which opened the door to the possibility of comparing the Indo-European languages with each other. Sanskrit was helpful in a number of ways: it was older than all other known languages (its oldest text goes back to before 1000 B.C.), and it was relatively transparent because its forms could be easily analyzed: the original structure of its forms was well-preserved. In Greek, on the other hand, the inherited sounds *s, i̯* and *u̯* had disappeared at an early stage, followed by the contraction of adjacent vowels which masked the structure of the original forms. A consequence of the transparent structure of Sanskrit, as opposed to Greek, was that the Sanskrit grammarians had been able to describe the way its forms were constructed: this proved to be of enormous importance for the work of Western scholars.

In 1498 Vasco de Gama discovered the sea route to India, and it was not long after that Europeans began to settle there. They quickly heard about Sanskrit, the holy language of India, which was comparable in many respects with regard to its social position to Latin in Europe in the Middle Ages. Almost immediately, in the period between 1500 and 1550, it was noticed that there were close similarities between individual Sanskrit words and the words of the languages of Europe. As knowledge of Sanskrit increased, such relationships were more frequently noticed. It was Sir William Jones who, in 1786, publicly acknowledged this relationship and correctly explained it. He was the Chief Magistrate of Calcutta, the capital of English India, and founder of the Asiatic Society, which encouraged scholarly research into all aspects of Indian culture and history. In a speech given to the Society, he said:

> The Sanskrit language, whatever be its antiquity, is of a wonderful structure; more perfect than the Greek, more copious than the Latin, and more exquisitely refined than either, yet bearing to both of them a stronger affinity, both in the roots of verbs and in the forms of grammar, than could possibly have been produced by accident;

so strong indeed, that no philologer could examine them all three, without believing them to have sprung from some common source, which, perhaps, no longer exists: there is similar reason, though no quite so forcible, for supposing that both the Gothic and the Celtic, though blended with a different idiom, had the same origin with the Sanskrit; and the old Persian might be added to the same family, if this were the place for discussing any question concerning the antiquities of Persia.

The reasoning that we see here assumes that so great a number of similarities cannot be explained by the borrowing of words between languages, and that it is therefore more likely that the languages in question must all have a common ancestor which relates them to each other. This analysis goes back to Van Boxhorn and had been passed on by a number of Dutch and English scholars before Jones, but the latter's authority was such that his statement is considered to mark the birth of Indo-European linguistics.

In his speech Sir William Jones did not go into further detail. For this reason we will look at a more extensive report on the subject that was prepared by the French priest Cœurdoux in 1767 (but which was not published until 1808 because the learned scholar who received it failed to realize its value!). Cœurdoux compared words with each other (his spelling of the Sanskrit words is not completely accurate), as for example:

Sanskrit:	*devah*	'god'	Latin	*deus*	Greek	*theós*
	padam	'foot'		*pes*, *ped-is*		*poús*, *pod-ós*
	maha	'great'				*mégas*
	viduva	'widow'		*vidua*		

These similarities seem to be quite obvious. Yet *theós* does not belong in the list: not everything which seems to be self-evident and trustworthy is therefore true. And this mistake is not only made by beginners!

But Cœurdoux was not satisfied with words alone. He noticed that Sanskrit had a dual (a separate form next to the plural for groups of two), just as Greek had; that the numerals were basically the same, as well as the pronouns, the negating prefix *a-*, and the verb 'to be'.

His list of similarities certainly shows insight, but not everything in it is correct. We must not forget that comparative linguistics did not yet exist! The dual does not provide an argument, because there are many languages in the world which have it (this was unknown at the time), so that what seemed to be an exceptional similarity is not really that exceptional after all. Moreover, for similarities to really count, they must take into consideration the form as well as the meaning of words: it is as if one should note that English makes use of an article and language X does, too, and conclude that a genetic relation must therefore exist between them, without paying

attention to the *form* of the article in question. Cœurdoux reasoned that numerals are not the kind of words one language borrows from another, for why should the numerals of one language be in any way better than those of another? Still, it is a fact that numerals often are borrowed, and that is not surprising: if you should speak Irish at home, for example, but need to speak English when you go to market, you will make sure that you know your English numerals; otherwise you would be taken advantage of too easily. The pronouns, however, (such as *I*, *you*, *this*, *that*) do provide a good argument. Such words are not easily borrowed, and similarities would therefore point toward linguistic relationship. The so-called *a*-privans is the *a*- in adjectives which expresses negation: Sanskrit *á-jñāta-* 'unknown', Greek *á-gnōstos*. This is a very strong argument: complete identity in form and meaning regarding an element that could hardly have been borrowed. It turned out that this *a*- goes back to $^*\underset{\circ}{n}$-, which became $^*un$- in Germanic and still is *un*- in English. Let us now examine the declension of the verb 'to be':

Sanskrit.	*as-mi*	'I am'	Latin	*s-um*
	as-i	'you are'		*es*
	as-ti	'he is'		*es-t*
	s-mas	'we are'		*s-umus*
	s-tha	'you are'		*es-tis*
	s-anti	'they are'		*s-unt*

We may notice the following: 1. Sanskrit *as*- and Latin *es*- mean 'to be'. 2. Both show a variant *s*-. 3. The two variants change in the paradigm. (The change which Sanskrit shows is the oldest, though that cannot be shown here without further evidence). 4. We see that Latin does not have an *-i* as does Sanskrit. If we leave the *-i* out of consideration, the endings are nearly identical: *-(V)m* (*V* = vowel), *-Ø* (zero, nothing: in fact it was *-s*; *-s-* derived from *-ss-*), *-t*, *-mVs*, *-t(h)V(s)*, *-Vnt*. This similarity is so congruent that in itself it is enough to *prove* that Sanskrit and Latin are related languages, that is to say, that they both derive from a common ancestor.

And how do we proceed from here? That is the subject of this book. I shall continually be emphasizing that common sense is the most important tool that comparative linguistics has, next to a thorough knowledge of all the facts and a good general insight into the way languages behave in general. It is impossible to posit rules which can always be counted on to produce correct conclusions: the possibilities in question are much too great. Let's look at the declension of 'to be' again. What we can already do is to try to reconstruct what the declension of this verb must have been like in Proto-Indo-European (PIE). The reconstruction process goes as follows. Compare *asmi* and *sum*. One has an initial vowel, while the other does not: we cannot say which is older. Both have an *s*; let us then assume that this element is old. Latin has a vowel

between *s* and *m*, but Sanskrit does not: we again have no way of saying which is older. Both have an *m*; that will be an old element. The final *-i* of Skt. is missing in Latin; at the moment we have no way of knowing whether *-i* is an original element or not. So the result is: *(V)s(V)m(i)*. In both languages, the second person begins with a vowel, which indicates that this element is old; but we have no way of knowing whether the *a* or the *e* is older, so we can go no further than noting the occurrence of an original vowel, *V*. This form can then be expressed as *Vs(i)*, etc.

The endings, however, allow us to go one step further. Because a final *-s* in Sanskrit has been preserved (*-mas*), we can also expect to find it in *-stha*, if there was one; so Latin added an *-s* in *-tis*. The explanation for the appearance of the *-s* in the Latin ending is a relatively simple one: it has been carried over from *-mus*, so that the first and second person plural end in *-s*. This yields the following picture of the PIE declension (parentheses indicate uncertainty) in the left-hand column:

(V)s-(V)m(i)	$*h_1\acute{e}s$ *-mi*
Vs-(i)	$*h_1\acute{e}s$ *-si*
Vs-t(i)	$*h_1\acute{e}s$-*ti*
s-(V)mVs	$*h_1s$-*més*
(V)s-t(h)V	$*h_1s$-$th_1\acute{e}$
s-Vnt(i)	$*h_1s$-*énti*

To the right, I have set out the present-day reconstruction of 'to be'. It appears that the reconstruction we have just proposed comes quite close to the truth, assuming that the currently accepted reconstruction is itself accurate.

Cœurdoux drew the correct conclusion: these languages must have derived from a common ancestor. He himself, being a Jesuite, thought that the common ancestor was probably the one language that all men were supposed to have spoken before the Tower of Babel collapsed. When he lived such thinking was not strange: people had dated the creation of the world on Biblical grounds to 4004 B.C. (or 5508 B.C.). We now know that the history of man and of language is much older. But in his time no one had any inkling of the long prehistory of the human species. Darwin was still to come: *On the Origin of Species* dates from 1859.

If we look back upon the history of comparative linguistics, we can say the following. People had to first be in possession of sufficient, reliable linguistic data, that is, a large number of languages had to be known in an accurately recorded form, before comparative linguistics could begin to develop. Moreover, scholars had to realize that comparison(s) could not be limited to the etymologies of words only, but that they had to take into account the entire language systems involved as well. Comparisons could not be made in an incidental or haphazard fashion, but rather had to be put upon a truly systematic footing. This applies equally, of course, to all sciences: all

material which is relevant must be the subject of systematic investigation. The comparison would also have to involve related languages which are not too distant from each other. Sanskrit, Greek and Latin were all usable: if we just compare Skt. *jánasas*, Gr. *géneos*, and Latin *generis*, we can already see the possibilities for reconstruction (see 9.2). But if we try comparing Latin *iuvencus* 'bullock' with Old Irish *óac* 'youth' (without knowing anything more), we will quickly find ourselves at a dead-end. The reason for this is that Irish did not get written down until relatively late (in the sixth century A.D.), and its forms then looked very different from the original Indo-European forms.

It was not until about 1860 that a discovery was made that proved to be of fundamental importance for comparative linguistics, namely that changes in the sounds of words actually follow exact rules. The idea is quite simple: if we find a number of words in which, for example, an *e* in Greek always corresponds to an *a* in Sanskrit (as in Skt. *jánas*, Gr. *génos* 'race' or 'gender', or Skt. *saptá* corresponding to Gr. *heptá* 'seven'), it is reasonable to expect the same in other cases too. It has turned out, after a great deal of material had been studied, that such rules *always* apply and that exceptions can always be explained and are governed by rules themselves, so that they cannot really be called exceptions. When we turn to the question of how languages change in Chapter 4 and following, the first thing we will have to pay attention to is the way in which such rules, the so-called 'sound laws,' operate on the sounds of a language.

Before we go more deeply into how comparative linguists work, we will first list and briefly describe the various languages which are related to Sanskrit, Greek and Latin: those languages which, taken together, make up the Indo-European family.

2.3   The Indo-European languages

2.3.1   Indo-Iranian

Indo-Iranian consists of Indo-Aryan and Iranian, which are closely related. The speakers of both languages referred to themselves as *ārya-*, 'Aryans'.

a.   *Indic (Indo-Aryan)*
The oldest Indic (or Indo-Aryan) language is referred to in its classical form as *Sanskrit* (*saṃskr̥tám*, 'perfect'), a term which is also used in a general sense for the whole of Old Indo-Aryan. The oldest form is called Vedic, after the Vedas (*veda-* 'knowledge'), which are the oldest texts of the Hindu religion. The oldest of the Vedas is the Rigveda (*r̥g-* 'song'), a collection of a thousand hymns (a work comparable in size to the Bible) (Ill. 1). This collection in itself already provides almost all the Indo-Aryan material needed for comparative linguistics. The text, which was orally transmitted

for hundreds of years, probably dates from a period before 1000 B.C. The language of the Rigveda is well known, although the actual meaning of its religious texts presents difficult problems of interpretation.

Classical Sanskrit was described by Pāṇini in a brilliant grammar written in the fourth century B.C. As is the case with Latin, Sanskrit continued to be used for a very long time (in fact, until the present day), even after it had disappeared as a spoken language. Sanskrit can boast an enormous literature. Well known are the two gigantic epics, the Mahābhārata and the Rāmāyana. Sanskrit is written in the 'devanāgarī' script.

As of the fifth century B.C. we speak of Middle Indo-Aryan. Because Middle Indo-Aryan languages do not exactly derive from the old Indo-Aryan which we know (but from other dialects), they are also significant from the viewpoint of comparative linguistics (see Section 10.5).

The languages of modern India are many, such as Hindi (formerly called Hindustani and in Pakistan, Urdu), Bengali, Marathi, Gujarathi and so forth. The Sinhalese spoken on Sri Lanka should be mentioned too. From Central India comes the language of the gypsies, which is called Romani.

The land of origin of the Rigveda is the Punjab. From there the Indo-Aryan language spread toward the south, but in South India a wholly different group of languages belonging to the Dravidian family were able to maintain their own identity.

b. *Iranian*

The two *Old Iranian* languages which we know of are Avestan (from the northeastern part of Persia) and Old Persian (from the southwestern part of the country). *Avestan* is the language of the Avesta, the 'Bible' of the teachings of Zarathustra. A number of hymns have been preserved from the prophet himself, the Gathas (Ill. 2). They date from 1000 to 800 B.C. and their language (Old Avestan) is just as archaic as that of the Rigveda. The interpretation of the Gathas is unusually difficult. The rest of the Avesta (the greatest part, in fact; the Avesta is the size of a large book) is written in Young Avestan, which clearly represents a younger stage of the language's development. Avestan is written in a script of its own.

Old Persian is the language of some dozens of documents which were written in a variant form of cuneiform writing very possibly designed at the behest of King Darius. They originate from Darius and his successors, the kings of the great Persian Empire. In the first inscription (Ill. 3) Darius relates how he came to power (the story of the 'False Smerdis' told by Herodotus). The inscription, incised high up on the boulders of Behistun near Ecbatana (Ḥamadān), with versions in Akkadian and Elamitic, is the world's most extensive one.

Because the Old Iranian corpus of texts is not so extensive, Middle Iranian is also important to comparative linguists. It is preserved in several varieties, such as Middle Persian or Pehlevi, Parthian, Sogdian, Khotanese, and Khwarezmian. The study of

these texts is fraught with difficulties. Modern Iranian comprises not only Modern Persian (Farsi), but also Pashto, the official language of Afghanistan, Kurdish, and the Ossetic language spoken by a minority people of the Caucasus (Map 3).

c.   *The Nuristani Languages*
The *Nuristani* languages (formerly called Kafir languages), like Ashkun and Prasun (also called Wasi) of Northeastern Afghanistan form, perhaps, a third branch of the Indo-Iranian group. Some scholars believe that they derive from the Iranian languages. Because they have only been known for the last two centuries, their contribution to our understanding of Indo-European has been limited. The *Dardic* languages, spoken in adjacent areas in Northern Pakistan and Northwestern India, like Shina and Kashmiri, appear to belong to the Indo-Aryan branch.

d.   *Older Traces*
The oldest Indo-Iranian is found in the Near East. The rulers who held sway over a Hurrian-speaking people called the *Mitanni* were apparently speakers of Indo-Iranian themselves, as is suggested by their names (*Tusratta* < **dus-ratha-* 'with destroying [battle]chariot'?), from the names of deities (Indra, Mitra), and from terms having to do with the training of horses which we know from a Hittite text (*aikavartan[n]a* 'one circuit'; Skt. *eka-* 'one', Skt. *vart-* 'to turn'). To our surprise this language was not Iranian, but Indo-Aryan. The relevant data can be assigned to a period around the fifteenth century B.C.

Indo-Iranian is without doubt the most archaic of the Indo-European languages, and to this we may add that it is very well known and that its structure also happens to be very transparent.

2.3.2   Tocharian

Tocharian was only discovered in 1900 in the Chinese province of Xinjiang (formerly written Sinkiang). It largely consists of manuscripts written in an Indic script, with Buddhist texts translated from Sanskrit (Ill. 5). There are two forms of Tocharian which differ from each other to such an extent that when speaking of Tocharian we can really speak of two languages. They are simply called A (or Eastern Tocharian) and B (or Western Tocharian). The A-texts were found in Turfan in the northeast, while the B-texts were found in Kučā in the southwest. They date from the sixth to the eighth centuries.

The language has a very extensive inflectional system, but is significantly changed with respect to the Indo-European languages. The nominal system (that is, the substantive = noun) is totally reorganized (see Section 8.2.2), while the verb is quite archaic. The study of the language has been slowed down by the fact that there is as yet no complete edition of all the relevant texts (which happen to be fairly limited in number) and no complete grammar or dictionary.

2.3.3   Armenian

Armenian is a language which we know as of the fifth century A.D. from Christian texts. Armenian has its own script (Ill. 6). The sound system of Armenian has often undergone extensive changes. In the morphology the noun has preserved the old system fairly well, while the verb has been radically transformed. A large number of words was borrowed from Iranian. The lexicon (i.e., the vocabulary) of Armenian contains the largest number of similarities with Greek of all the main Indo-European branches.

The oldest language is called Classical Armenian. Middle Armenian and Modern Armenian have many dialects (sub-divisible into East and West Armenian) which are important for IE but are not yet well studied.

2.3.4   The Anatolian languages

a. *Hittite*
The Anatolian languages (Map 4) are those languages of Anatolia (present-day Turkey) that are more closely related to *Hittite*. In 1906, an archive of clay tablets was excavated in Boğazköy (150 km east of Ankara) (Ill. 7), which on the basis of information from these texts could be identified as Hattuša, the capital of the Hittites. In 1917, the language in which these texts were written was deciphered by the Czech scholar B. Hrozný. The texts tell us about all kinds of aspects of life at the time of the Hittites, who had established a powerful kingdom in the period 1650–1200 BC. It extended as far as Syria, where they were locked in struggle with the pharaoh of Egypt. We now have some 30.000 (pieces of) tablets (not all of which have been published). Although the bulk of these texts stem from the 13th century BC, there are also considerable numbers of texts from older periods, some even dating to the 16th and possibly 17th century BC. We can therefore distinguish between Old, Middle and Neo-Hittite. The earliest attestations of Hittite stem from Old Assyrian texts from an area south of Hattuša that date back to the 19th century BC, and in which Hittite names and a few loanwords from Hittite can be found.

The script is a form of the Babylonian-Assyrian cuneiform. This causes many difficulties since it is a syllabic script, which means that each sign represents one syllable. For example, in order to write */parhzi/* it is necessary to write *par-ah-zi* or *par-ha-zi*. In such cases it is not always clear what is intended. Hittite is very archaic, and thus extremely important for understanding Indo-European, but many aspects of its (historical) interpretation are still unclear or not agreed upon.

b.   *Palaic*
Palaic, which shows a few characteristics in which it is more archaic than Hittite, is only known from a few texts discovered at Boğazköy. Our knowledge of it is very

limited. It is the language of the land *Palā*, which may have to be situated to the north-east of Hattuša.

c.   *Luwic*

Seven languages are more closely related to each other, the Luwic languages.

Cuneiform Luwian is known from some 200 pieces of clay tablet from the Boğazköy archive. Since many of these pieces are small, our knowledge of the language is rather limited. Luwian was the language of the land *Luwiya*, which may have been situated to the south of the Hittite core area.

Hieroglyphic Luwian (formerly called Hieroglyphic Hittite), was written in its own hieroglyphic script which was in use from 1500 up to and including the eighth century BC, after 1200 especially in the southeast of Turkey and in North Syria, in city-states such as Carchemish. The texts in question were found inscribed in stone (and on seals) (Ill. 8). The last few decades have seen a tremendous increase in our knowledge of the hieroglyphic script and the Hieroglyphic Luwian grammar, which nowadays makes it, after Hittite, the second best known Anatolian language.

Lycian also belongs to the Luwic group. Lycia is the 'bump' on the south coast of Turkey, near Alanya. We possess 150 inscriptions or so from the fifth and the fourth centuries B.C. written in this language in an alphabet that is related to that of Greek. In 1973 a sizable inscription was discovered in Xanthos with a translation in Greek and in Aramaic (a trilingual, thus). Much of this language still remains unclear, however.

In Lycia, we also find two inscriptions written in the Lycian alphabet, that contain a related yet different language. This language is called *Milyan*, but we find the designation *Lycian B* as well (contrasting with 'normal' Lycian which then is called Lycian A). Our understanding of these texts is extremely poor.

Carian is the language of Caria, the area northwest of Lycia. It is known from some 200 inscriptions, dating from the sixth to fifth century B.C., the majority of which are actually found in Egypt, where Carians served as the pharaoh's bodyguards. Carian is written in its own alphabet, related to that of Greek, which nevertheless was undeciphered till very recently. Only when in 1996 a bilingual inscription (Carian — Greek) was discovered in Kaunos, a definite decipherment of (part of) the Carian alphabet was possible. Our knowledge of Carian is still extremely limited, yet it seems that also Carian belongs to the Luwic group.

Sidetic is known from only eight inscriptions from the area of Side, a city at the south coast of Turkey. The inscriptions date from the third century B.C. and are written in their own alphabet. Due to the limited number of inscriptions, our knowledge of Sidetic is extremely limited as well. Still this language seems to belong to the Luwic group too.

Pisidian is the name given to some dozens of inscriptions from the area of Pisidia, written in the Greek alphabet, and dating from the first or second century A.D. The

texts probably only contain names, some of which may show the genitive case ending -*s*, on the basis of which it is thought that Pisidian may belong to the Luwic group as well.

d. *Lydian*

Lydian is the language of classical Lydia, situated in central western Anatolia. It is attested on some 100 stone inscriptions in a native alphabet related to Greek, dating from the eighth to third century BC, with a peak around the fifth and fourth century. Most inscriptions stem from Sardis, the capital of Lydia. Although there are a few bilingual texts (Lydian — Greek and Lydian — Aramaic), our knowledge of Lydian is still rather small. What we do know about the language, is that it stands quite apart from the other Anatolian languages.

2.3.5   Phrygian

Phrygian (Map 4) is the language of the Phrygians, who lived in central Turkey. Its capital, Gordion (120 miles southwest of Ankara), as well as its king, Midas, are well known. We know the language from some two hundred inscriptions written in a Greek alphabet from the eighth to the fourth centuries B.C. (Old Phrygian), and as many from between the second and third centuries A.D. (New Phrygian) (Ill. 9). Much in these inscriptions is unclear to us. Phrygian is not one of the Anatolian languages.

2.3.6   Balto-Slavic

The Baltic and the Slavic languages were originally one language and so form one group.

a. *Slavic*

The oldest known Slavic language is *Old Church Slavonic* (also known as Old Bulgarian), which goes back to the 9th century A.D. Shortly before this time the Slavic languages still formed a unity. The oldest texts comprise Christian literature. The 'Slav apostles' Cyrillus and Methodius from Byzantium were responsible for the first texts (translations of the Bible) around the year 865, and adapted the Greek alphabet to the sound system of the language. The script that they used is called the 'glagolitic' script (from *glagolъ* 'word') (Ill. 10). It was only later that the so-called Cyrillic alphabet began to be used, which now, for example — in a somewhat altered form — is used in writing Russian. The language was that of the Slavs around Salonika, thus that of the Bulgarians and the Macedonians. The texts which we possess are copies from later times which reveal the local idiosyncrasies of the districts in which they were composed.

It is possible to subdivide the Slavic languages into East-, West- and South Slavic (Map 5).

East Slavic is *Russian*, which is divided in the so-called Great Russian (another name for Russian itself), Ukrainian (or Little Russian) in the south, and White Russian in the west. Among the oldest documents written in East Slavic are those written on birch bark from Novgorod, from the 11th century A.D. (Ill. 11)

South Slavic comprises *Bulgarian*, further *Macedonian* (in the south), *Serbo-Croatian* and *Slovenian* (in the northwest).

West Slavic comprises the important languages *Polish*, *Czech* and *Slovakian*, but also less important languages. Polish belongs to the Lekhitic group together with (the now extinct) *Polabic* and *Pomoranian* (to which *Kashubian* and *Slovincian* belong). There are also *High* and *Low Sorbian* in the area to the southeast of Berlin.

b.   *Baltic*

The Baltic languages are Lithuanian and Latvian, as well as the now extinct Old Prussian. *Lithuanian* has been known since the sixteenth century, but it is very archaic and for this reason important for Indo-European. The study of historical linguistics requires not only data from the literary language but also from the dialects (such as Žemaitian). *Latvian* is less archaic than Lithuanian. Estonian is a not an Indo-European language, but is related to Finnish.

Old Prussian stands far removed from both other languages (and is for that reason important). Its historical interpretation still poses many problems. We have only a vocabulary list (of 1400 words), three catechisms and Luther's *Enchiridion* (1561) in this language.

2.3.7   Thracian

We have two inscriptions (one on the golden ring of Ezerovo, Ill. 12) in *Thracian*, which was spoken in present-day Bulgaria and southern Romania, neither of which we understand. We can only rely on glosses (individual words whose meanings have been given) and names (and loan words in Rumanian), from which we can draw some conclusions about the development of its sounds. Perhaps we should make a distinction between *Thracian* and *Dacian* (in the north) (Map 6).

2.3.8   Macedonian

Macedonian (Map 6) presents us with even more severe problems than does Thracian: we have nothing more to work with than a few glosses and names. It seems to be closely related to Greek.

2.3.9   Greek

We know Greek in a variety of dialects. *Ionic-Attic* naturally comprises Ionic, the language of Homer and Herodotus; and Attic, the language of Attica and Athens, the classical language of the tragedians (Aeschylus, Sophocles, Euripides), the comedy writers (Aristophanes), the historians (Thucydides) and the philosophers (Plato, Aristotle). The two dialects hardly differed from each other.

Aeolic was spoken in Thessaly and Boetia (from which area we have some inscriptions) and on Lesbos (the poetess Sappho).

Arcado-Cyprian is a dialect which we know from inscriptions from Arcadia, in the heart of the Peloponnesus, and from Cyprus, where we have inscriptions dating from the sixth century B.C. to the first century A.D. in a syllabic script that is related to Mycenaean. This language was spoken by the original inhabitants of the Peloponnesus who either fled into the mountains or emigrated over the seas to Cyprus, probably during the invasion of the Dorians.

West Greek comprises *Doric*, in the south and east of the Peloponnesus (Sparta) and on the islands, such as those of Crete and Rhodos, as well as *Northwest Greek.*

Our knowledge of the last three groups is limited. The oldest inscriptions go back to the 9th century B.C., and literature begins at the end of the eighth century with Homer (Ill. 14). Both of the Homeric epics, the *Iliad* and the *Odyssey*, are written in the Ionic dialect, but are the result of an oral tradition: the tellers of these epics created them with each performance, supported as they were by a large number of fixed descriptions (formulae). The tradition behind these epics must be very long, for some elements in them are linguistically older than others or derive from other dialects (Aeolic, but also probably Mycenaean).

Mycenaean is considerably older: we know it from clay tablets from 1400 and 1200 B.C. from Knossos on Crete, from Pylos, Mycenae and Thebes (Ill. 13). They are written in a syllabic script called Linear B that had been used earlier (in the Linear A variant) on Crete. Linear B was only deciphered in 1952 by the English architect, Michael Ventris. Although we possess thousands of tablets, the information they disclose is still limited: they mostly comprise inventory lists and are full of names. Moreover, the fact that they are written in syllabic script creates many uncertainties.

2.3.10   Illyrian

Illyrian (Map 7) is the name given to the language remains which have come down to us on the western Balkans. We have only names and glosses (which can easily contain mistakes). Scholars believe that it is possible to distinguish three groups: *Illyrian* in the east, *Dalmatian-Pannonic* in the west, and *Liburnian* in the northwest.

2.3.11   Messapian

We have six hundred inscriptions from the fifth century B.C. to the first century B.C., written in the *Messapian* language of southeast Italy (Map 7, Ill. 15). It is possible that Messapian is a form of Illyrian, but it is difficult to be certain, since we know so little about Illyrian.

2.3.12   Albanian

Albanian is a language which has been known since the 15th century. It consists of many dialects which belong to two groups: Gheg in the north and Tosk in the south. The modern standard language is mainly based on Tosk. Albanian is also spoken in Kosovo and western Macedonia and in parts of southern Italy. The transmission of the language starts late, and it has undergone heavy influence from Greek, Latin, Slavic and Turkish. It is changed so much that it is now very far indeed from Proto-Indo-European. It is often thought (for obvious geographic reasons) that Albanian descends from ancient Illyrian (see above), but this cannot be ascertained as we know next to nothing about Illyrian itself.

2.3.13   Venetic

Venetic has come down to us in the form of about three hundred inscriptions from the Italian region of Veneto. It is written in a North Etruscan alphabet. Scholars believe that it belongs to the Italic group (see next section, Map 7), but this supposition is not generally accepted.

2.3.14   Italic

Italic is the name given to Latin and the languages which are most closely related to it (Map 7). Two groups can be distinguished:

a.   *Latino-Faliscan*
Latin is the language of Latium, in particular of the city of Rome. Latin literature begins in the third century B.C., and inscriptions in it go back as far as before 500 B.C. (Ill. 16) Latin became the common language of different countries due to the expansion of the Roman empire. This was the origin of the various Romance languages, such as Italian, Spanish, Portuguese, French and Romanian. All these languages are, then, Indo-European, but we will not deal with them further as our purpose is to emphasize the oldest history of the Indo-European languages. Occasionally, we shall wish to refer to one or more of the Romance languages when examining the linguistic history of Latin.

Faliscan was the language spoken in and around Falerii to the north of Rome, and it is closely related to Latin. We possess some hundred inscriptions which were written in it.

b.   *Sabellian*

The remaining languages of the Italic group are nowadays called the Sabellian languages (formerly the Osco-Umbrian languages). In the first place there is *Umbrian*, which was spoken in Umbria, east of Tuscany. The Umbrians originally also inhabited Tuscany, but were driven out by the Etruscans, who had come from the area around the Aegean Sea. The Umbrian language is principally known from seven bronze tables discovered at Iguvium (now Gubbio), the 'Tabulae Iguvinae'. They provide lithurgical instructions for the local religious brotherhood. The oldest of them are written in their own script, the youngest in the Latin alphabet. They date from around 400 B.C. to 150 B.C. (Ill. 17).

Second comes *Oscan*, which was actually more important than Umbrian. It was the language of the Samnites, in the middle and south of Italy. We have Oscan inscriptions, from the same period, which are written in its own script, in the Greek alphabet (south Italy was, of course, extensively colonized by the Greeks), and in Latin script.

Of the other languages spoken in Italy, such as those of the Sabines, the Aequi, the Marsi and the Volsci (formerly only these languages were all called Sabellian), very little has come down to us.

Pre-Samnite (i.e., pre-Oscan) is the name given to a handful of inscriptions found in Campania and Lucania, dating from before 500 B.C.

South Picene is the name given to a few inscriptions found on the east coast of middle Italy, dating from the sixth century B.C. (Ill. 18). They are hence older than the Oscan and Umbrian texts.

Whether the *North Picene* inscriptions and *Ligurian* (in the vicinity of Genoa), which we only know in the form of names, were in fact Indo-European languages is uncertain. It seems improbable that *Rhaetic* (spoken from Lake Garda to the Inn valley) is an Indo-European language, as it appears to contain Etruscan elements. Rhaetic must not be confused with Rheto-Romance [sometimes called Rhaeto-Romanic], a Romance language spoken in Switzerland.

Siculian in eastern and *Elymian* in western Sicily (of which, concerning both, very little is known) are probably Indo-European languages, but whether they belong to the Italic group is uncertain.

2.3.15   Celtic

The Celts came from Central Europe, from whence they swarmed out in a number of different directions (Map 8). For instance, the Galatians of St. Paul's letter who lived in Central Turkey were Celts.

a.   *Continental Celtic*
On the continent of Europe Celtic became extinct. *Gaulish*, which was still spoken in France when Caesar was busy with his conquests, is known now from a number of inscriptions (Ill. 19). *Lepontic*, which we know from inscriptions around Lake Maggiore and the other lakes, was a separate Celtic language. In the north of Spain there was *Celtiberian*. The longest Celtiberian inscriptions have been discovered in recent decades near Botorrita (Ill. 20, 21).

b.   *Insular Celtic*
On the islands of western Europe, that is to say, in Britain and Ireland, Celtic was able to maintain itself. *Old Irish* is known from the Ogham inscriptions which date from about 300 A.D., but they have very little information to offer us (Ill. 22). By the time that glosses and texts begin to appear in the seventh century, the language was much further developed (Ill. 23). The sound changes which Irish underwent are very complex, and the language has for this reason become exceptionally difficult. Irish continued to have a very rich literature. Scots Gaelic is a dialect of Irish (the Irish call themselves *Goídel*, from which *Gael* derives), as is Manx, spoken on the Isle of Man. At the present moment the number of speakers of Irish is very small.

The other Celtic languages form one group, the *British languages*, that is to say, the Celtic languages of Britain (Map 9). Celtic was spoken all throughout England, Wales and Scotland when the Romans arrived (with the possible exception of Pictish in the far north). In the fifth century A.D. British Celtic began to subdivide into Welsh, Cornish and Breton. These languages are all much simpler than Irish. *Middle Welsh*, like Irish, has a very rich literature which dates from the 12th century. Old Welsh can be dated from the seventh century, but its texts are extremely hard to understand. *Cornish* and Breton are more closely related to each other, but neither has a very interesting literature. Cornish, which was spoken in Cornwall, died out in the eighteenth century. *Breton* crossed the English Channel from Wales and Cornwall and became established in Brittany (Bretagne) sometime between 450 and 600 A.D. There are still a considerable number of people who speak it, but the youngest generation mostly speak only French.

2.3.16 Lusitanian

A few inscriptions have been found in Portugal and western Spain, from about the second century AD., which seem to be Indo-European but not Celtic. The language is called Lusitanian.

2.3.17 Germanic

Germanic is the last group which we must discuss. Its area of concentration was the south of Norway and Sweden, Denmark and the coast of Germany. It was from this area that the Germanic languages spread further south.

a. *East Germanic*

East Germanic is so named because it spread to the Balkans and even the Crimea. In was long thought that East Germanic peoples moved from Scandinavia through Poland and the Carpates, but it seems more likely that they first headed south through Germany or Bohemia and then followed the Danube downstream. Of the various languages in this group, only *Gothic* is well known to us from the Bible translation of Bishop Wulfila (311–382), which has partially survived. He worked among the Visigoths (often translated incorrectly as the West Goths) to the north of the Danube. The most important manuscript in this language, the 'Codex Argenteus' ('of silver') from around 500 A.D. was written in northern Italy (which was then in the hands of the East Goths; the West Goths had established a kingdom in the south of France and Spain). Other texts which have survived are hardly of significance. Gothic is clearly more archaic than the other Germanic languages (which only began to be handed down later on) (Ill. 25). In the sixteenth century a number of Gothic words were recorded on the Crimean peninsula. Practically nothing else remains of the other East Germanic languages.

b. *North Germanic*

The Scandinavian languages form the North Germanic group. The oldest data with respect to this group comes from the *runic inscriptions* which have come down to us (Ill. 24). The oldest of these is from the second century A.D. The oldest runic inscription is thus older and much more archaic than Gothic, but our knowledge of its language is very fragmentary.

North Germanic can be subdivided into West Nordic (Norway and Iceland) and East Nordic (Sweden and Denmark). We use the term *Old Norse* in a broader sense for North Germanic up to 1500, and in a more limited sense for old West Norse, that is to say, for the language of Norway and Iceland; and because the literature of Iceland, dating from 1150, is the earliest and the richest, Old Norse is used as a synonym for *Old Icelandic*, unless otherwise indicated. Iceland was colonized between 870 and 930

from Norway (the *landnáma*). Well-known are the collections of songs about gods and heroes, the *Edda*, and the sagas, such as the *Njálssaga*, the *Egilssaga* and so forth. Old Icelandic has undergone fairly complicated changes to its sound system. For the purposes of comparative Indo-European linguistics, it is far more important than either *Swedish* or *Danish*.

c.   *West Germanic*

The remaining Germanic languages all belong to the West Germanic group. These are English, Frisian, Dutch and German. The Angles and the Saxons crossed over to England; their language is Anglo-Saxon or *Old English*, which is known as a separate language since about 700 A.D. The oldest *Frisian* dates from the tenth century. It is more closely related to English than it is to any of its continental relatives. This is due to the period before the Anglo-Saxon migration to Britian, when Angles, Saxons and Frisian formed the so-called Anglo-Frisian community in the north(west) of Germany. Some of the linguistic innovations of Anglo-Frisian also reached Low German and (coastal) Dutch.

The language area called 'Deutsch' ('German', from **teutā* 'people' [cf. 'Dutch' for the people and the language of the Netherlands]) comprises Old Saxon, Old Franconian and Old High German. *Old Saxon* has been known since the ninth century, principally from a poem called the *Heliand* (i.e. 'Heiland,' or 'Savior'). *Old High German* has been known since the eighth century in a number of dialects. High German is the term given to those dialects which, either completely or in part, underwent the second or High German sound shift (see Section 11.4.6). The term 'high' refers to the mountainous regions of southern Germany. The line of division runs from Maastricht in the Netherlands across Germany to the south of Berlin. Old Saxon was not affected by the second sound shift, and Franconian only in part; therefore we find Low (or Nieder-) and High Franconian (this last term is not currently used). *Franconian* spread toward the west until it reached the Seine, and gave its name to French, but the language itself was ousted by Romance French. The line between them ran through Belgium. In the Netherlands, Low Franconian was spoken along with Frisian and Saxon. A division can be made between Old East and Old West Low Franconian (of which almost nothing is left). Present-day Dutch is based on the latter; its literature starts with Middle Dutch (1150–1550).

The subgrouping of the Germanic languages has always been the subject of much scholarly dispute. In principle the situation is a clear one. East Germanic split off from the main language first. Contact between the speakers of North and West Germanic became less and less frequent. In the southern regions of this large language area changes began to occur, originally involving the whole area (West Germanic developments), but later these changes originated from a number of different centers and covered smaller areas. Such centers were, for instance, the North Sea coast (whence

Anglo-Saxon and Frisian derive) and populated areas further south (the Rhine and Main valleys). The changing influences resulted in a large number of different dialects. The Angles and Saxons went over to England from Schleswig-Holstein. The relative chronology and the extension of the different changes affecting the Germanic languages have not been fully described yet.

2.3.18   Summary

Here is a short overview of the different branches of Indo-European in the order of their importance for the reconstruction of Proto-Indo-European (the order can be disputed):

1. Indo-Iranian 2. Greek 3. Anatolian 4. Balto-Slavic 5. Italic 6. Celtic 7. Germanic 8. Tocharian 9. Armenian 10. Albanian.
Minor languages: 11. Phrygian 12. Messapian 13. Venetic 14. Thracian 15. Macedonian 16. Illyrian.

Of numbers 11–13 we have some inscriptions, of numbers 14–16 hardly anything other than names and glosses.

2.4   The splitting up of Proto-Indo-European; dialects

We do not know much about possible dialects in Proto-Indo-European (PIE), or about the exact way in which it split up and about the possible dialect groups which came into being immediately after it split up.

Formerly it was thought that the palatal consonants ($\acute{k}, \acute{g}, \acute{g}^h$) offered proof that Proto-Indo-European had split into two languages. The word for 'hundred' was used as a test case: Lat. *centum*, but Av. *satəm* (Skt. *śatám*), both from PIE *$d\acute{k}mtóm$; the $\acute{k}$ became a *k* in Latin, but an *s*-sound in Indo-Iranian. All languages can be classified into the 'centum' or the 'satem' group (among which, besides Indo-Iranian, are also Balto-Slavic, Armenian and Albanian). In the nineteenth century this division into two groups seemed to have been a division into west-east. This picture, however, was called into question by the discovery of Hittite and Tocharian, which were spoken in the east but were nevertheless centum languages. More important is that there were no other shared linguistic developments among these languages, except for that of the *s* following *i, u, r* or *k*. The conclusion is that only these two phonetic developments (viz. satemization and the *iurk*-rule of *s*) took place in the same area, probably not long after the splitting up of Proto-Indo-European.

Another criterion for assuming that there were dialect areas was seen in the endings of the dative and the instrumental plural, which began with *bh* (Skt. *-bhyas*,

-*bhis*), but which in Germanic and Balto-Slavic began with an *m* (OCS -*mъ, -mi*). The origin of this fact, which was used as a dialect criterion, was also a riddle. The solution is simplicity itself: the dative had an *m* in PIE (*-*mus*), the instrumental a *bh* (*-*bʰi*), and the two forms influenced each other. There is no pressing reason to assume that Germanic and Balto-Slavic underwent a common development.

The supposed unity of the Balto-Slavic group is often disputed, but it is really above all doubt. Both language groups share a host of developments in common, especially with respect to the accent.

The Italo-Celtic unity is a much more difficult one to prove. In any case, the basis for such a supposition are only a few sound changes and perhaps also a morphological (i.e. form) development. At the other extreme, even the unity of the Italic group has been challenged, but the fact that the organization of the verb is the same for all languages of the Italic group must be due to a common development, which points to a long period of unity.

The discovery of Hittite raised a new problem: Hittite makes a very archaic impression owing to its simplicity. In particular, several forms and categories which are routinely found in the other Indo-European languages are missing from Anatolian, for instance the comparative in *-*i(o)s-* and many verbal categories, such as the aorist, the perfect, the optative, simple thematic stems, and the dual. This lack might be explained through the loss of some of these categories from Anatolian, in which case we can continue to assume that it inherited the same PIE linguistic system as Greek, Indo-Iranian, and the other branches. But it is also conceivable that some of these missing grammatical categories never existed in Anatolian to begin with, and that the other Indo-European languages jointly created them after the Proto-Anatolians had left the PIE homeland. Hittite, in other words, would have split off much earlier from PIE than the other languages. This was baptized the Indo-Hittite hypothesis by Sturtevant in the 1920s: there would have been an Indo-Hittite proto-language from which, first, Proto-Anatolian and, much later, the other IE languages derived. Those other Indo-European languages experienced a period of common development which Hittite did not undergo. Support for the Indo-Hittite scenario (sometimes under a different name) has increased in recent years (since 1995). There is a growing body of evidence which is best explained on the assumption that Proto-Anatolian did not share all the common changes which characterize the other IE languages.

2.5   Indo-Uralic; the Nostratic theory

People have wondered if Indo-European is related to other language families. A relation has been proposed between Indo-European and two large families of languages which are geographically close to the Indo-European area. The search for a direct

relation between the Semitic family, or its putative Afroasiatic ancestor, and Indo-European has proved disappointing, and is now generally rejected.

This is not the case with the Uralic language family group. It shows similarities to Indo-European with respect to essential aspects of the language system, such as the endings of the accusative (*-*m*), verbal endings, as well as personal and demonstrative pronouns. The similarities of vocabulary are not very numerous, but some comparisons are very convincing: for example, Finnish *vesi*, gen. *veden* 'water', PIE **uodr*, gen. **udens*; Finnish *nimi*, gen. *nimen* 'name', PIE **h₃neh₃mn*, Skt. *nā́ma*. The situation is complicated because of the possibility of very early borrowings. When, however, Samoyed, which, together with Finno-Ugric forms the Uralic group, is also taken into consideration, things become easier: Samoyed has preserved archaic elements. A link with Indo-European has been suggested by many scholars. In recent years, this link has been made much more explicit. As it turns out it is possible to reconstruct inflexional morphemes for a common prestage of Indo-European and Uralic which can be called 'Indo-Uralic'. It is also possible to derive aspects of the attested Indo-European and Uralic languages from such a proto-language by means of normal phonetic and analogical developments.

Recently the old idea that most of the languages of Eurasia must be related — the Nostratic theory — has enjoyed renewed interest. In the 1960s, the Russian scholar Illič-Svityč had worked out in great detail the exact development of the sounds. According to the Nostratic theory, groups which belong to this super-family are the Indo-European, the Uralic, as well as the Altaic, the Dravidian and the South Caucasian families. This branch of comparative linguistics is clearly still in its infancy, and unfortunately the number of scholars working on these problems is very restricted. The main problem is the time depth of the reconstructed events. It will be clear that the earlier the alleged proto-language must have existed, the smaller the number of features becomes which we can reconstuct with any plausibility. The most promising approach to Nostratics seems to be to compare at most two or three families at a time, as with Indo-Uralic (Indo-European + Uralic), Uralo-Yukagir (Uralic + Yukagir), etc. Based on the fact that the number of mutual similarities is too large to be coincidental and cannot all be explained from borrowing (although that is partly a matter of taste), several comparativists agree on a Eurasiatic macrofamily, as first proposed by Greenberg. This would comprise Indo-European, Uralic, Yukagir, Nivkh, Chukchee-Kamchatkan and Eskimo-Aleut (sometimes all together termed 'Uralo-Siberian') and also Altaic, Korean and Japanese. Together with the less similar South Caucasian and Dravidian, this Eurasiatic family would then form Nostratic. Some also include Afroasiatic, but this is more disputed.

Following this line of thought, we may also ask if the languages of the New World could possibly be related to those of the Old World. Because the Americas were populated from Asia across the Bering Strait, there must be some relationship — unless

the Eurasian relatives have since become extinct. Many scholars are now convinced that the Siberian language Ket (Yenisean) is related to Athabaskan in North America.

This brings us to the question of whether all languages did not in the earliest of times have one common origin. An origin in one place (and time), or two or three places, would seem more probable than the idea of many languages beginning in many different places. But comparative linguistics cannot answer this question, which remains outside of its competence. Comparative linguistics is equally incapable of answering the larger question of how human language itself arose in the first place.

Chapter 3

The Culture and Origin
of the Indo-Europeans

3.1 The culture of the Indo-Europeans

Reconstruction provides us with a PIE vocabulary. It is fair to assume that the things which the reconstructed words represent also actually existed. If there should be a PIE word for 'snow' then the Indo-Europeans would have known what snow was. And if they had a word for 'plow' they must have had or known some kind of plow, too. In this way it is possible to form a picture of the culture of the Indo-Europeans. In this present section we shall take a brief look at this culture. We need to begin by making a distinction between the concepts of material and non-material culture. The latter has principally to do with organization and religion. A separate section has been devoted to the way in which reconstructions tell us something about the poetry of the Indo-Europeans. A brilliant book on the subject of PIE culture is J.P. Mallory, *In Search of the Indo-Europeans* (1989); a thematic survey of PIE culture is the encyclopaedia of Mallory and Adams (1997). Section 2 of the index enables the reader to find additional evidence elsewhere in this book.

3.1.1 Material culture

Places of Habitation. The Indo-Europeans did not have cities. There is one word which seems to mean a similar concept, **p(o)lH-* (Skt. *púr*, Lith. *pilìs*, Gr. *pólis*), but we know that this word in the beginning only referred to an enclosed space, often situated on high ground (cf. Gr. *akrópolis*), where people retreated in times of danger. The word **uiḱ-* (Lat. *vīcus*, etc.) meant a 'settlement' and was the seat of a tribe, clan or family. Goth. *baurgs*, G. *Burg* remind us of Gr. *púrgos* '(wall) tower' but the latter is probably of non-Indo-European origin (cf. Gr. *phúrkos*).

Houses. The word for 'house' was **dōm* (Arm. *tun*, Gr. *dō*), **domHos* (Skt. *dáma-*, OCS *domъ*, Gr. *dómos*, Lat. *domus*) from the root **demH-* 'to build' (Gr. *démō*). From this same root we have Goth. *timrjan* 'to carpenter.' Without any doubt, the houses must have been made of wood. The word for door, **dʰuer-* (Skt. *dvā́ras*, Arm. *dur-kʻ*, OCS *dvьri*, Lith. *dùrys*, Toch. B *twere*, Gr. *thúrā*, Lat. *forēs*, OIr. *dorus*, OHG *turi*) often

appears in the plural, which indicates a double door. We know the word for doorpost, *h_2(e)nh$_2$t*- (Skt. *átā*, Av. *ąiϑiiā*-, Arm. *dr-and* 'door-post', Lat. *antae*, OIc. *ǫnd* 'ante-room'). There was also a 'hearth' (Lat. *āra*, Hitt. *hāssa*-).

Household Goods. Hardly any words for household goods have come down to us from PIE. Words for pots and pans are very often loan-words.

Eating and Drinking. That the Indo-Europeans ate (*$h_1$ed*-, Lat. *edō*, etc.) and drank (*peh$_3$(i)*-, Lat. *pō-culum*, 'beaker') is not surprising. The verb for 'cooking' is known to us, *pek^w*- (Gr. *péssō*, Lat. *coquō*, etc.) and perhaps the word for 'baking', *b^h(o)Hǵ*- (Gr. *phógō*, OE *bacon*). Meat (for consumption) was *mēms*- (Skt. *māṁsá*-, etc.) There was a word for 'fish' (*$dǵ^h$uH*-, Gr. *ikhthūs*, etc.). Perhaps they ate acorns (*g^wlh_2-(e)n*-, Gr. *bálanos*, etc.). A very archaic word is the word for 'salt', *seh$_2$l*- (Lat. *sāl*, etc.) The word for 'grain' (*ǵrHno*-, Lat. *grānum*, OIr. *grán*, Goth. *kaurn*, OE *corn*), is only found in the west. Old words for different kinds of grain are *(H)ieu*-, perhaps 'bearded wheat' (Skt. *yáva*-, Lith. *javaĩ*, Gr. *zeiaí*) and *puHro*- (Lith. *pūraĩ*, SCr. *p̀ir*, Gr. *pūroî*).

For milk, butter and cheese see the description under *Cattle Raising, Domestic Animals*, below.

Sweetening was provided by honey, *mélit* (Gr. *méli*, Hitt. *milit*, etc.).

Of the fruits, we only know the word for 'apple', *$h_2$ebōl* (Lith. *obuolȳs*, OCS *jábloko*, OHG *apful*.)

The Indo-Europeans drank 'mead' *med^hu*, in effect, 'the sweet' (Skt. *mádhu*, Lith. *medùs*, OCS *medъ*, Gr. *méthu*, OIr. *mid*, OE *medu*). The word often also meant 'honey', so it must have been a drink based on honey. Whether the word for 'wine' was also Indo-European in origin has long been a matter for dispute, because the Semitic word (Arab. *wain*) and the Georgian (*γwino*) both make use of the same root. It seems to me that the Hittite form, *wiyana*-, points toward PIE *u(e)ih$_1$-(o)n*- (Arm. *gini*, Gr. *oĩnos*, Lat. *vīnum*).

Agriculture. Words for sowing, *seh$_1$*- (Lith. *sḗju*, OCS *sějǫ*, Goth. *saian*, OE *sāwan*) and plowing, *$h_2$erh$_3$*- (Lith. *ariù*, OCS *orjǫ*, Gr. *aróō*, Lat. *arō*, OIr. *airim*, Goth. *arjan*) tell us that the Indo-Europeans were acquainted with agriculture. The word for 'plow' is derived from this last word, *$h_2$erh$_3$-trom* (Lith. *árklas*, OCS *ralo*, Arm. *arawr*, Gr. *árotron*, Lat. *arātrum*, OIr. *arathar*) as is the word for 'field' (Gr. *ároura*, Lat. *arvum*). Our word 'acre', *h_2eǵros* (Skt. *ájra*-, Gr. *ágros*, Lat. *ager*, Goth. *akrs*) probably represents fallow land, on which the cattle would be driven (*h_2eǵ*-, Gr. *ágō*, etc.). For 'grain' see under *Eating and Drinking* above. We know the word for 'barley', *g^h(e)rsd^h*- (Lat. *hordeum*, OHG *gersta*). A 'quern' is also known, *g^wreh$_2$uōn* (Skt. *grā́vā*, Arm. *erkan*, OIr. *brao*, Toch. B *kärweñe*), *g^w(e)rh$_2$n*- (Goth. *-qairnus*, OE *cweorn*, Lith. pl. *gìrnos*, OCS pl. *žrъny*).

Cattle Raising, Domestic Animals. The most important domesticated animal was the cow, *g^weh_3us (Skt. *gaús*, Latv. *gùovs*, OCS adj. *govęždъ*, Toch. A *ko*, Toch. B *kau*, Gr. *boũs*, Lat. *bōs*, OHG *chuo*, OE *cú*). The word for 'bull' was perhaps *teh_2uros (Lat. *taurus*, etc.); the Germanic word, Goth. *stiur* cannot be related to it. In the Semitic languages there is a word which strongly resembles it: Hebr. *šōr*. Whether this is coincidence or a question of borrowing, and if so, in which direction, is disputed. For 'ox' see under *Transport*. Hardly less important was the 'sheep', *h_3euis (Lat. *ovis*); we also know the word for 'lamb': *h_2eg^wnos (Lat. *agnus*, etc.). For 'goat' we have Gr. *aíks*, Arm. *aic* and perhaps Av. *izaēna-* 'of leather', but the reconstruction *$h_2eiǵ$- is problematic; and Skt. *ajá-*, Lith. *ožỹs* < *$h_2eǵ$-. A general word for small livestock was *$péku$ (Skt. *páśu*, Lith. *pēkus*, Lat. *pecus*, Goth. *faihu*, OE *feoh*). From this root was derived Lat. *pecūnia*, 'money', which tells us that livestock served as currency.

'Milking' was *$h_2melǵ$- (Gr. *amélgō*, OE *melcan*, etc.). The word for 'milk' (Gr. *gála*, gen. *gálaktos*, Lat. *lac*) is difficult to reconstruct; perhaps it was *$glkt$-s. 'Butter', *$h_3(e)ng^w$-n (OPr. *anktan*, OIr. *imb*) appears according to ancient commentaries to have been used in the first instance as 'ointment' (Lat. *unguen*). *$tuHri$-s was 'cheese' (Av. *tūiri-*, Gr. *tūrós*).

The horse was certainly the animal which more than any other characterized the Indo-Europeans: *h_1eku-(o-) (Hitt. *$ekku$-, Skt. *áśva-*, Lat. *equus*, etc.). We also know the 'foal': *$p(ō)lH$- (Gr. *pōlos*, Goth. *fula*, E. *foal*). The donkey or ass is unknown: it belongs to more southern regions. There are two words for 'pig': *$suHs$ (Av. *hūš*, Gr. *sũs*, *hũs*, Lat. *sūs*, OHG *sū*; cf. OE *swīn* 'swine') was probably the adult pig, whereas *$porḱo$- (Lat. *porcus*, OE *fearh*) was the young pig.

There were no chickens. The chicken only comes later via Persia from Southeast Asia (in the eighth century B.C. in Greece). Equally absent in the Indo-European world were rabbits. In Europe they only appear in the time of the Romans, from Spain. There were, however, 'hares', *$ḱh_1s$- (Skt. *śaśá-*, OE *hara*) but they were not bred (breeding hares is not that easy).

The favorite domestic animal was without any doubt the 'dog', *$ḱuōn$ (Skt. *śvá̄*, Gr. *kúōn*, OE *hun-d*, E. *hound*, etc.), unless the 'mouse' also counted (*$muHs$, Skt. *mú̄s-*, E. *mouse*, etc.).

Clothing. The Indo-Europeans did not need to walk around 'naked' (*ne/og^w-; Skt. *nagná*, Hitt. *nekumant-*, Lith. *núogas*, OCS *nagъ*, Gr. *gumnós*, Lat. *nūdus*, OIr. *nocht*, OIc. *nakinn*, OE *nacod*). There is a root for 'clothing oneself', *ues- (Skt. *váste*, Gr. *héstai*, Lat. *vestīre*, Goth. *wasjan*, OE, OHG *werian*). The root *Hou- probably meant 'putting on footwear' (Arm. *aganim*, Lith. *aũti*, OCS *obuti*, Lat. *ind-uere*). It is not possible to deduce the exact names for particular articles of clothing. Clothing changes too quickly. The root *$(H)ieh_3s$- meant 'girding oneself' (Av. *yāsta-*, Lith. *júostas*, Gr. *zōstós*, etc.). It is clear that the Indo-Europeans wore a girdle of some kind. 'Weaving'

($*h_1ueb^h$-; Skt. *ubhnā́ti*, Gr. *huphaínō*, OE *wefan*) and 'sewing' are known ($*siuH$- next to $*suH$-; Skt. *syūtá-*, Lith. *siū́tas*, Hitt. *suēl*, Lat. *suō*, Goth. *siujan*). 'Wool' was without doubt the basic material out of which clothing was made ($*HulHn$-; Lat. *lāna*, Gr. *lēnos*, Goth. *wulla*).

Metals. Only one word for metal is known, which probably is the word for 'copper' or perhaps 'bronze', for that is the metal which was used first: $*h_2éios$ (Skt. *áyas*, Lat. *aes*, Goth. *aiz*, OE *ār*, E. *ore*). Iron appears much later. 'Gold', $*ǵ^h(o)l(H)$- (Skt. *híraṇya-*, Av. *zaraniia-*, OCS *zlato < *zolto*, Goth. *gulþ*, E. *gold*), perhaps derived from the word for 'yellow', and 'silver', $*h_2(e)rǵ$-nt- (Skt. *rajatám* with unclear *ra-*, Av. *ərəzata-*, Lat. *argentum*, OIr. *argat*, perhaps also Arm. *arcat'*), derived from $*h_2erǵ$- 'white', were also known.

Tools do not lend themselves to reconstruction. Gr. *pélekus*, Skt. *paraśú-* 'axe' may be derived from $*peleku$-, but the formation of the word is strange. The old connection with Akkadian *pilakku* is incorrect, because this word never meant 'axe'. It is difficult to reconstruct a basic form for Gr. *aksī́nē*, Goth. *aqizi* 'axe'.

Weapons are also difficult to reconstruct. There is Skt. *así-* for 'sword', Lat. *ēnsis*, which may derive from $*nsi$-. Words for 'club', 'lance', 'shield' cannot be reconstructed. This is not the case for 'bow' and 'arrow', even though we only find words for them in Indo-Iranian and Greek: $*g^wiH$- 'bow (tendon)' (Skt. *jiyā́-*, Gr. *biós*), $*isu$- 'arrow' (Skt. *íṣu-*, Gr. *īós*).

Transport. The Indo-Europeans made use of wagons, evident by the verb $*ueǵ^h$- 'to carry, ride' (Skt. *váhati*, Lith. *vežù*, OCS *vezǫ*, Lat. *vehō*, Gr. *ókhos* 'wagon', OIr. *fecht* 'trip', Goth. *ga-wigan* 'to move') and words for 'wheel': $*Hrot$-h_2 (Skt. *rátha-* 'wagon', Lith. *rātas* 'wheel, circle', pl. *rataī* 'wagon', Lat. *rota*, OHG *rad*) and $*k^we$-k^wl-os (Skt. *cakrá-*, Toch. A *kukäl*, Toch. B *kokale*, Gr. *kúklos*, OE *hwēol*). The root $*Hret$- meant 'walk', $*k^wel$- 'turning'. There is no question that we are dealing here with massive (as opposed to spoked) wheels, that is to say, wheels which were made out of one whole piece of wood, such as that found in De Eese in Drenthe in the northeast of the Netherlands (from about 2400 B.C.), or with wheels made of planks of wood. The word for 'axle' is also known, $*h_2eks$- (Skt. *ákṣa-*, Lith. *ašìs*, OCS *osь*, Gr. *áksōn*, Lat. *axis*, OE *eax*). From the earliest times the wagon was pulled by the 'ox', $*uks$-$én$ (Skt. *ukṣā́*, Toch. B *okso*, W. *ych*, Goth. *auhsa*). A very important development was the use of the 'horse', which was much faster: $*h_1eku(o)$ (Hitt. *ekku-*, Skt. *áśva-*, Toch. A *yuk*, B *yakwe*, Lith. cf. *ašvíenis* 'stallion', Gr. *híppos*, Lat. *equus*, OIr. *ech*, OS *ehu-skalk* 'horse-groomer').

Transportation over water is attested to by $*neh_2us$ 'ship' (Skt. *naús*, Gr. *naūs*, Lat. *nāvis*, OIr. *nau*, OIc. *nór*). We also know the words for 'rowing' and 'oar', $*h_1reh_1$- (Skt. *ari-tár-*, Lith. *ìrti*, Gr. *eré-tēs*, Lat. *rēmus*, OIc. *róa*). It is not likely that the Indo-Europeans had any other navigable craft except those that could be rowed.

Trade. There is no word for 'trade', but there is one for 'buying', *$k^w rih_2$-, *$k^w ri$-n-eh_2-ti 'he buys' (Skt. *krīṇā́ti*, Gr. *príasthai*, ORuss. *krьnuti*, OIr. *crenim*), from which Toch. *kuryar/karyor* 'trade' is derived. 'Purchase, purchase price' is *$ue/osno$- (Skt. *vasná-*, Arm. *gin*, Gr. *ōnos*, Lat. *vēnum*; Hitt. *wās-^{i}* 'he buys'). It has been noticed that these words were originally used to refer to the buying of humans, that is, of slaves.

3.1.2 Organization and religion

Family. Alongside words for 'father' (*$ph_2 t\acute{e}r$, Lat. *pater*, etc.), 'mother' (*$meh_2 t(\bar{e})r$, Lat. *māter*, etc.), 'brother' (*$b^h r\acute{e}h_2 t(\bar{e})r$, Lat. *frāter*, etc.), 'sister' (*$su\acute{e}s\bar{o}r$, Lat. *soror*, etc.), 'son' (*$suHnu$-, *$suHiu$-, Skt. *sūnús*, Gr. *huiós*, Goth. *sunus*, etc.) and 'daughter' (*$d^h\acute{u}gh_2 t\bar{e}r$, Gr. *thugátēr*, Goth. *dauhtar*, etc.), we also have the word for 'wife of the son' (*$snus\acute{o}s$, Skt. *snuṣā́*, OCS *snъxa*, Gr. *nuós*, Lat. *nurus*, OE *snoru*) and terms for the family of the husband: 'his father' (*$sue\acute{k}uros$, Skt. *śváśura-*, Lith. *šẽšuras*, Gr. *hekurós*, Lat. *socer*, OHG *swehur*), 'his mother' (*$sue\acute{k}ruH$-, Skt. *śvaśrū́*, OCS *svekry*, Lat. *socrus*, etc.), 'his brother', (*$deh_2 iu\bar{e}r$, Skt. *devár-*, Lith. *dieverìs*, OCS *děverъ*, Arm. *taygr*, Gr. *dāḗr*, Lat. *lēvir*, OHG *zeihhur*), 'his sister' (*$\acute{g}elh_2 \bar{o}u$, OCS *zъlъva-*, Gr. *gálōs*, Lat. *glōs*) and even the 'wife of his brother' (*$i(e)nh_2 ter$-, Skt. *yā́tar-*, OLith. *jentė*, OCS *jatry*, Hom. pl. *einatéres*, Lat. *ianitrīcēs*). On the other hand, words for the family of the woman are unknown. From this we may conclude that the woman went to live with the family of her husband. For 'marrying' we find *ued^h- 'to carry (home)', that is, by the husband (Lith. *vedù*, OCS *vedǫ*, OIr. *fedid*). The 'husband' is referred to as 'master', *$potis$ (Skt. *páti-*, Gr. *pósis*, Goth. (*brūþ-*) *faþs* 'fiancé'), he is the 'master or lord of the house', *$demspotis$ (Skt. *dámpati-*, Gr. *despótēs*). The 'husband of the daughter' is *$\acute{g}(e)mH$-$\bar{o}r$, Skt. *jā́mātar-*, Gr. *gambrós*.

'Grandfather' was *$h_2 euh_2 os$ (Hitt. *huhhas*, Lat. *avus*); 'grandchild', in a general sense, 'descendant', *$n\acute{e}p\bar{o}t$ (Skt. *nápāt*, Lith. *nepuotis*, Lat. *nepōs*, OIr. *nia*, OE *nefa*; E. *nephew* is borrowed from French). There was a special relation with the 'mother's brother' (*$meh_2 tr\bar{o}us$, Gr. *métrōs*) and 'mother's father' (perhaps *$h_2 euh_2 os$ was in fact 'mother's father', whereas 'father's father' was simply a, or the, 'father') because they did not stand in the direct line of familial authority. The word for 'widow' is known to be *$h_1 uid^h uh_2$- (Goth. *widuwo*, etc.).

The family lived in the *$u(e)i\acute{k}$- (see the section *Places of Habitation* above), *$uoi\acute{k}o$- (Gr. *oĩkos*), the whole group of buildings where the father and the married sons — the 'extended family', the 'Grossfamilie' — were settled. The father was therefore Skt. *viś-páti-*, Lith. *viẽšpats*.

Tribe, People. Comparative linguistics has little information to offer us on the subject of social organization at a higher level than that of the family. There is a word for 'people', *$teut\bar{a}$ (Lith. *tautà*, Osc. *touto*, OIr. *túath*, Goth. *þiuda*, OE *þéod*), from which

the words 'Dutch' and 'Deutsch' are both derived, though it is only found in Europe and may not be Indo-European in origin. The word for 'king' was *$h_3r\bar{e}\acute{g}$-s (Skt. *rā́j-*, Lat. *rēx*, OIr. *rí*). This personage was probably something more like a tribal chieftain than a king in the modern sense.

A 'free man' was *$uiHr\acute{o}$- (Skt. *vīrá-*, Lith. *výras*, Lat. *vir*, OIr. *fer*, Goth. *wair*), but also *$h_2n\acute{e}r$ (Skt. *nár-*, Arm. *ayr*, Gr. *anḗr*, Osc., Umbr. *ner-*, W. *ner*). This last was a title of more honor, but the exact difference in meaning is not known. We saw under *Trade* that the Indo-Europeans probably owned slaves, but no word for 'slave' is known. The stranger was called *g^hosti-, which could be 'guest' but also enemy: OCS *gostъ* 'guest', Lat. *hostis* 'enemy', Goth. *gasts*. Linguistic reconstruction will not yield more information than this (see also under *Religion* below).

Law. There is little that can be said with certainty on the subject of justice. Lat. *iūs* 'law' (<*ieus*?) is probably related to Skt. *yós* 'welfare', Av. *yaoš* in *yaoždā-*, 'to purify'. Its actual meaning is difficult to establish. The root *$di\check{k}$- 'to show, indicate, (express)' probably has a specific legal significance: Lat. *iūdex* 'judge' < *iūs-dik-s*, Gr. *díkē* 'justice', *dikaspólos* 'judge'; *$di\check{k}$- is, then, more or less equivalent to 'spoken justice'.

'Stealing' and 'thief' are both known: *$(s)teh_2$- (Skt. *(s)tāyú-*, OCS *tajǫ*, *tatъ*, Hitt. *tayezzi*, OIr. *táid*).

It is worthwhile pointing out that our knowledge of the history of the oldest jurisprudence of the Indo-European peoples is quite extensive, though we cannot deal with it here. We must limit ourselves only to that knowledge which can be obtained through linguistic reconstruction. For example, it is very likely that the Indo-Europeans had words for 'oath' and 'swearing', but there are no comparable words now which would allow us to reconstruct them.

Religion. Apart from the names of the heavenly bodies and natural phenomena (such as Gr. *Hélios*, the sun), there is only one name of an Indo-European god which we know, *$Di\acute{e}us$ *$ph_2t\acute{e}r$ (Skt. *Dyáuṣ pitā́*, Gr. *Zeùs patḗr*, Lat. *Iuppiter*). The word is related to 'day' (Skt. *dívā* 'during the day', Arm. *tiv*, Lat. *diēs*, OIr. *die*); Zeus would then be the god of the clear skies. The word for 'god' is derived from the same form: *$deiuos$ (Skt. *devá-*, Lith. *diēvas*, Lat. *deus*, OIr. *día*, OIc. pl. *tívar*; from this root are derived OIc. *Týr*, OE *Tīg*, OHG *Zīo*). The other names for gods have no cognates in other languages. Old etymologies such as Gr. *Ouranós* ('heaven'), Skt. *Váruna*, have proven to be untenable. Names of gods such as 'Indra', 'Apollo', 'Poseidon' do not offer reliable etymological possibilities either. Whether there were more gods than Zeus is something we do not know with any certainty. We do know from the *Rigveda* of the twin brothers, the Aśvins (derived from *áśva-* 'horse'), who were named *Divó nápātā*, 'sons of Zeus' and who are similar to the *Dióskouroi* ('sons of Zeus') in Greece and the Latvian *Dieva dēli* ('sons of God'). In Greece they were called Kastor and Poludeukes, but these names are not found elsewhere. We do perhaps find their echo in the names

of the founders of Anglo-Saxon Britain, Horsa and Hengist ('Horse' and 'Stallion'). Epithets and adjectives pertaining to the gods are unknown, with the exception of Skt. *dātā́ vásūnām*, Av. *dāta vaŋhuuąm*, Gr. *dōtēres eáōn* 'those who give goods, riches,' PIE **déh₃tōr *h₁uesuom*. The gods are, of course, 'immortal', **n̥mr̥tós* (Skt. *ámr̥ta-*, Gr. *ámbrotos*). The root **dʰeh₁s-*, which means something like 'holy' (Lat. *fēriae* 'holidays', *fēstus, (ne)fas(tus)* 'days upon which certain actions may (not) be performed', *fānum* 'holy place' < **fas-nom*), also provides words for 'god': Arm. *di-kʿ* < **dʰeh₁s-es*, Gr. *theós* < **dʰh₁s-o-*. **kuentos* also means 'holy' (Av. *spǝnta-*, Lith. *šveñtas*, OCS *svętъ*). 'Believing' is expressed by Skt. *śrad dhā́-*, Lat. *crēdō*, OIr. *cretim*, PIE **kred dʰeh₁-*. The root **ieh₂ǵ-* 'to venerate' we find in Skt. *yájate*, Gr. *házomai* and *hagnós, hágios* 'holy.' There are several words which would come to mean 'to pray': **gʷʰedʰ-* (OP *jadiya-*, Lith. *pa-si-gendù*, OCS *žędati*, OIr. *guidim*, cf. Gr. *pothéō* 'to desire, to long'; the meaning of 'to pray' is, then, perhaps not old); **prek-* (Lat. *precēs*; elsewhere simply 'to ask'); in a number of languages we find **meld-* (Lith. *meldžiù*, OCS *moljǫ*, Arm. *małtʿem*, Hitt. *māld-ⁱ*). **spend-* 'to pour a libation' (Hitt. *ispānt-*, Gr. *spéndō*, Lat. *spondeō*) naturally has a religious meaning. Whether or not priests were involved is uncertain. It has been proposed that Lat. *flāmen* may be related to Skt. *brahmán-*, but the comparison raises difficulties. Lat. *vātēs* is related to OIr. *fáith* 'poet', Gaul. *ouateis* 'seers' (from the same root we have OE *Wōden*, OE *wōd*, 'song', OHG *wuot*, 'rage, fury'). The form is an archaic one, **ueh₂t-eh₁-*.

A very extensive literature exists concerning the religious beliefs and practices of the oldest Indo-European peoples and of the Indo-Europeans themselves. These studies deal with a comparison of deities, rituals, myths and beliefs, none of which we can deal with here. However, we will make an exception for the theories of Dumézil. He was of the opinion that many parallels point toward a tripartite division of Indo-European society into 'three functions', those of priests, warriors and farmers (producers), which were most clearly continued in the Indian caste-system as seen in the 'brahmins', the 'kshatriyas' and the '*vaiśyas*'. (These names are actually completely different in Iranian.) Dumézil believed that Indo-European society was dominated by an 'idéologie tripartie'. Initially many people enthusiastically adopted this theory and applied its formulae to practically everything. Many of the resulting interpretations were, however, quite far-fetched, and in the end the theory was dropped. The existence of a priestly class at this early time, and a division between farmers and warriors, is very improbable. Belier (1991), who discusses the development of Dumézil's theory, concludes that the theory is untenable.

3.2   Poetry

3.2.1   An Indo-European poetic language

Comparative linguistics provides us with the reconstruction of individual words. But can we also reconstruct larger units? In order to be able to do so, the Proto-Indo-European units would need to have survived in the related languages of the Indo-European family.

Another question which leads us to the same point is whether there was a (Proto-)Indo-European literature. In literature we distinguish between prose and poetry. Poetry is language which is formed into short, distinct units (lines) which have a certain structure. This is not the case with prose. The Indo-Europeans could not have had prose that was written down: the earliest examples of writing date roughly from the time that PIE began to split up, and even then only in one area quite removed from its center, Sumer. Oral prose in the form of stories which were recounted cannot, of course, be rediscovered, precisely because it had no fixed form. But the case is otherwise with poetry, because its language is one of fixed forms which can therefore be easily remembered: poems are learned by memory, but prose is not. We should add that in the early period which is our concern, poetry was no less than prose a medium that was subject to oral transmission. We know, for example, that the Homeric epics were orally transmitted. In order to do this, use was made of fixed 'formulae', such as *rhododáktulos ēṓs* 'rosy-fingered dawn'. Our best chance for reconstructing Indo-European poetry would be by carefully examining formulae of this kind which have survived.

It is in fact the case that in the oldest poetry of the Indo-European family, especially that of Indo-Iranian and Greek, formulae have been discovered which are composed of etymologically related words and are therefore probably of Indo-European origin. In the previous section (see 3.1.2, under *Religion*) we already saw the formula, 'those who give goods, riches'. Very remarkable is Skt. *ákṣitam śrávas*, Gr. *kléos áphthiton* 'immortal fame', which derives from PIE *$kléuos$ *$ṇd^hg^{wh}itom$. The word *ákṣitam* is only found in Sanskrit in this context and must therefore be an old survival. In the same semantic area we have Skt. *máhi śrávas*, Gr. *méga kléos* 'great fame', PIE *$megh_2$ *$kléuos$, a formula which in itself does not seem very remarkable. The *Iliad* shows us that the fame of heroes was sung forth, as when Achilles sings the *kléa andrōn*, 'the famous deeds of men, heroes.' This formula, too, is found in the *Rigveda*: *śrávas nṛṇā́m*, PIE *$kléuesh_2$ *$h_2nróm$. The combination Av. *vohu srauuah-* 'good fame' has its parallel in OIr. *fo chlú*, PIE *$uésu$ *$kléuos$.

The sun was called 'the wheel of the sun', in Skt. *sū́ryasya cakrás* and Gr. *hēlíou kúklos* (Aeschylus), but also in OIc. *sunnu hvél* and OE *sunnan hweogul* (PIE *sh_2uens *k^wek^wlos).

Taking into consideration that such fixed formulae were probably made in PIE, it seems reasonable to believe that other formulae whose words are not all etymologically related are also continuations of PIE formulae, at least when they fit into the picture that we have so far been able to put together. Next to Skt. *pr̥thú śrávas* 'wide fame' Greek has *kléos eurú*. A not altogether common name for the sun is Skt. *spáśam víśvasya jágatas* 'he who spies upon the whole world' (literally 'the moving one', or 'the living beings'), which seems too similar to the Gr. *theōn skopòn ēdè kaì andrōn* 'he who spies upon gods and men' to be merely coincidental, but only the root of the noun is etymologically the same (**speḱ-* 'see'; in Greek, because of metathesis, *skep-*). Here we can only reconstruct the meaning (and the root of 'to see').

If we should allow these formulae to lead us to the conclusion that there was an Indo-European poetic language, and thus Indo-European poetry, the formulae themselves provide an interesting confirmation of the conclusion because one of them describes the idea of 'poets' and 'writing poetry'. Pindar (Pyth. 3, 113) speaks of *epéōn … téktones* 'builders (carpenters) of … songs' and in the *Rigveda* it says *vácāṃsi… takṣam* 'I will build words (a song) with carpentry.' Indo-European had, then, the expression **uekʷōs* (**uekʷésh₂*) **tetḱ-* 'to frame words or a song together (in the manner of carpentry).'

3.2.2   Indo-European metrics

If there was an Indo-European poetic language, in what form were its poems cast? Is it possible to reconstruct their metrical structure?

Meillet was of the opinion that it was possible. He was one of the greatest scholars in the field of Indo-European linguistics, and the author of the wonderful book (the *Introduction*) that still provides the best introduction to the subject, even though it is now, in part, obsolete. Meillet noticed that the oldest Indian and Greek poems were based on a prosodic structure of alternating long and short syllables (for which the same prosodic rules were applicable: 'short' is a syllable with a short vowel followed by one consonant, all other syllables being long); at the end of the line (the cadence) this alternation was strictly regulated, whereas it was free at the beginning. Both the Indic and the Greek systems used the caesura (word-end at a fixed place in the line at a syntactically significant break); in both systems, too, a line had a fixed number of syllables, but a line could also have a variant with one syllable less (catalexis). Meillet saw an exact similarity between the eleven-syllable line used by the Greek poetess Sappho and the *triṣṭubh* of the *Rigveda* (¯ long, ˘ short, x long or short, | caesura; ' begins the cadence):

| *triṣṭubh* | x | x | x | x | \| | x | ˘ | ˘, | ¯ | ˘ | ¯ | x |
| Sappho | ¯ | ˘ | ¯ | x | \| | ¯ | ˘ | ˘ | ¯ | ˘ | ¯ | x |

The Sapphic line characterized the so-called Aeolic poetry. It is important to note that both single (˘) and double (˘˘) short can come in between the long syllables. In the Homeric hexameter, to take another case, this is not so. There it is possible for two shorts to take the place of one long syllable (isochronism), something which does not occur in Aeolic or old Indic poetry. Meillet for this reason wondered whether the hexameter had been borrowed from non-Indo-European inhabitants of Greece.

Meillet's theory was further developed by Roman Jakobson, who believed that the oldest Slavic metric system was comparable to the one Meillet described, and derived from an Indo-European decasyllabic line. A similar continuation could be seen in a verse-type utilized in Old Irish. Recently, it has been suggested that the Greek hexameter, too, might be derived from this form. But Meillet's theory has always met with skepticism, and recently this has been increasing. An important point is that the Indic verse line must, in the first instance, be compared with the Iranian. The Gatha-Avestan texts are written in verse form, but they do not demonstrate a (regular) alternation of long and short syllables; rather they have only a fixed number of syllables per line or part of a line (before and after the casura). Whoever wishes to argue that the Indic verse line was characterized by a regular alternation of long and short syllables, must either accept that this must be a recent innovation (which took place after Iranian split off from it), or that Avestan had lost a system which the Indian verse form once had. Meillet chose for the latter option, but it is perhaps more likely that the Avestan system is the older of the two. In general, it is not very probable that metrical structures can be preserved over such a long time, that is, for 1500 to 2000 years.

It is, then, more probable that Indo-European verse consisted of a fixed number of syllables, as was the case with Avestan. Longer lines would have contained a caesura. What follows is a stanza from a hymn of Zarathustra in Gatha-Avestan (Yasna 44.4). The line consists of four plus seven syllables (there is a caesura after the fourth syllable); in the translation below the same form has been preserved. The text is given in a phonetic transcription, not in the normal transcription of the manuscript.

> *Tat ϑvā pṛsā   ṛš mai vauca, Ahura:*
> *Kas-nā dṛta   zām ca adah nabās ca*
> *avapastaiš,   kah apah urvarās ca?*
> *Kah vaʔatāi   vanmabyas ca yaugt āsū?*
> *Kas-nā vahauš,   Mazdā, dāmiš manahah?*

> This I ask Thee,   tell me truthfully, O Lord:
> Who has upheld   the earth below and heavens [above]
> from falling down,   who the waters and the plants?
> Who to the wind   and the clouds has yoked the swift [horses]?
> Who, Wise One, is   the founder of Good Thinking?

(*Ahura*, 'Lord', and *mazdā* 'wise', later grew into one word, 'Ahuramazda', the one god whose existence Zarathustra taught).

It is probable that this kind of song is of Indo-European origin, for we find a parallel to it in the *Edda* (Alvíssmál 15):

> *Segðu mér, Alvíss,   — ǫll of rǫk fira*
> *voromk dvergr, et vitir —*
> *hvé sú sól heitir,   er siá alda synir,*
> *heimi hveriom í.*

> Tell me this, Alwis   — of everything in the world
> I think, dwarf, that thou knowest —
> What the sun is called,   the sun which people see,
> by all creatures of the world.

In the answer the sun is referred to, among other things, as a 'wheel', *hvél* — see the section above. The Germanic verse here is stress verse, and is not related in this respect to Indo-European poetry.

3.3   The arrival of the Indo-Europeans

It is probable, even certain, that a number of Indo-European languages became extinct without leaving a trace. In particular in central and western Europe, where we have no records from before the Roman period, many Indo-European languages may have been ousted without a trace by the later Balto-Slavic, Germanic and Italo-Celtic peoples. The only way to trace such an earlier language would be through evidence provided by the extant languages. The existence of a layer from a previous Indo-European language has been proposed more than once particularly for Slavic, but the matter is disputed.

There are some clear direct or indirect indications for the presence of non-Indo-European languages in areas which would eventually become dominated by Indo-European languages. The Basques have managed to survive, albeit in an area smaller than the one they originally inhabited. We have the so-called Iberian inscriptions in the east and south of Spain, which are almost certainly written in a non-Indo-European language (about which we know very little). In the most northern regions of Scotland lived a tribe called the Picts. Although the situation is not completely clear, there are strong indications that they spoke a non-Indo-European language. (It is supposed that they also had command of one of the British Celtic languages, which they took over from the Celts.)

An original language which disappears but which leaves traces in the surviving successor is called a substratum language. In Greek we find traces of a substratum of non-Indo-European origin which may be termed 'Pre-Greek'. Greek words belonging to this layer are characterized by their non-IE structure or by phonological vacillation pointing to their status as loanwords. For example, *kupárissos* 'cypress', *huákinthos* 'hyacinth', *labúrinthos* 'labyrinth' are non-Indo-European, as are many place names, such as *Kórinthos*, *Athēnai*, *Spártē*, *Thēbai*, *Mukēnai*. Many other geographical names are non-Indo-European, too: *Ólumpos* (a name which we find in more than one place; perhaps it simply meant 'mountain'), *Parnāssós*, *Kérkura* 'Corfu', *Krḗtē*, *Lésbos*. The Linear A script which was found on Crete probably represents a non-Indo-European language, and the same may be said for Eteocretan, which we know from some ten inscriptions in a Greek alphabet. It is clear that one or more non-Indo-European languages were spoken in Greece before the Greeks themselves arrived there, and that (some of) these languages were connected with Anatolia. Ancient Greek writers report to us that *Pelasgian* was spoken here and there in Greece. Some scholars have assumed that Pelasgian was in fact an Indo-European language spoken in Greece before the Greeks came, but this idea has now been given up.

There are also indications for one or more substratum languages in Latin, though these are less clear. Geographical names tell us that in the north of Russia, Finnish was spoken before the area came under Russian influence. Hittite has around 700 words inherited from PIE; the rest must have been borrowed from languages from those areas which the Hittites came to inhabit. Etruscan is a remnant of such an original language, which was spoken in western Anatolia before it migrated to Tuscany. Whether or not there was a substratum language in the Germanic group is disputed, but it seems to me evident that there must have been one.

Linguistic information offers us no basis for determining the moments of time at which the Indo-European peoples began to inhabit the areas where they eventually settled. Evidence for this must come from archeology. The methodology employed is explained in Section 3.4 below; here we we will only briefly summarize the results.

We think that the *Indo-Iranians* are represented by the Andronovo culture (2000–1000 B.C.), in the vicinity of the Aral Sea. The Indians are believed to have partaken in the Gandhara Grave culture to the north of the Indus. The land of the *Rigveda* is the Punjab: we can follow the Indians, then, on their way south. It is probable that they destroyed the Indus culture of Mohenjo-Daro and Harappa (principally in Pakistan), about 1600 B.C. The Iranians are thought to be represented by the arrival of plain gray ware on the Iranian Plateau in the Iron Age I (1400–800 B.C.). Older related peoples are found in the northeast (the Gorgan culture).

Whether the *Tocharians* go back to the Afanasievo culture of the third millennium along the lower reaches of the Yenisei river is unclear. They are at any rate probably the first of the surviving Indo-European branches who began moving toward the east.

The *Anatolians* must have entered Anatolia from the west (over the Hellespont, the Dardanelles), but they are difficult to trace by means of archeology. The Phrygians, whom we first find in Troy VII b in the 12th century B.C., probably also came from the west.

The *Armenians* cannot be identified at an early date by archeological traces, but it is probable that they too came from the west and belonged to the group of peoples who overran the Hittite empire in the 12th century B.C.

The *Greeks* probably arrived in Greece during the transition from the Early Helladic II to the Early Helladic III period (ca. 2200/2100 B.C.). At this time sites are destroyed, new kinds of houses are built and a pottery style called 'Minyan' appears. Other scholars argue for a somewhat later date, namely the beginning of the Middle Helladic culture, at about 2000–1900 B.C.

Insofar as the *Thracians* are concerned, there were infiltrations of Indo-European peoples into the Balkans from south Russia during all of the fourth millennium, which brought about a complete change. In this area the Thracians developed as a distinct group; the Armenians and Phrygians came from the same area.

In *Italy* different moments in time have been suggested for the arrival of Indo-European peoples. The Proto-Villanova culture (as of 1100 B.C.), which is related to the Urnfield culture of central Europe, does not signal the first arrival of the Indo-Europeans. The Terramare-culture (1500–1000 B.C.) was probably developed by an Indo-European people. The Remedello-Rinaldone complex (3200–2500 B.C.) bears all the marks of an Indo-European invasion: a new style of ceramics, a new burial rite, changes in the social structure, the introduction of a warrior aristocracy, the introduction of metallurgy, the horse and the chariot. But it is still not possible to assign language groups to particular cultures.

The *Celts* are seen as present in the Hallstatt culture of 750–450 B.C. in what is now Austria, Switzerland, and northern Spain, from whence they spread to the east and to England. The arrival of the Celts in Ireland and England cannot be precisely dated (probably in the seventh century B.C.). They were the first Indo-Europeans who arrived in Spain. The Romans followed later.

In the period between 300 and 900 A.D. *Slavic* split up into a number of different languages. At this time the great expansion to the east and northeast took place into areas which were Baltic and Finnish. In the south the Slavic speakers moved during the seventh century across the Danube, and in the west they reached as far as the Elbe. Earlier than this, we find the Slavs represented in the Zarubinets culture, which dates from the second century B.C. to the second century A.D. and was located on the upper reaches of the Dnieper, and perhaps, also in the Przewor culture, between the Elbe and the Weichsel/Vistula. The oldest Slavic names for rivers are found in the territory of the Chernoles culture (725–200 B.C.), from the Pripet marches to the southern Bug. Earlier still, about 1500 B.C., we have in this area the Komarov culture. The

Balto-Slavic unity must be dated roughly between 2000 and 1000 B.C., so it may well be that the Komarov culture was established by the Balto-Slavic people. It is unclear whether the Trziniec culture to the west of the Komarov culture (from the Elbe to the Bug) was also Balto-Slavic in its composition.

Baltic once covered a much larger area, as far as Moscow and Kiev, if we trust the evidence provided by the names of rivers, but it is not possible to say how old these names are.

The *Germanic peoples* had their original territory in the south of Sweden and Norway, in Denmark and in northern Germany. In this large area we find the Jastorf culture, from 600–300 B.C. In the west (including the eastern half of Holland), the Harpstedt culture is considered to be related to it. The Jastorf culture (Map 10) developed without any interruptions directly out of the Bronze Age culture which preceded it.

3.4   The origin of the Indo-Europeans

> 'While many have maintained that the search for the PIE homeland is a waste of intellectual effort, or beyond the competence of the methodologies involved, the many scholars who have tackled the problem have ably evinced why they considered it important. The location of the homeland and description of how the Indo-European languages spread is central to any explanation of how Europe became European. In a larger sense it is a search for the origins of western civilization.'
>
> (Mallory, *Journal of Indo-European Studies* 1, 1973, 21f.)

At the time when the Indo-European family was first discovered and scholars began to speculate on their probable place of origin, their initial thoughts were directed toward India because of the evident antiquity of Sanskrit, and in any case, toward Asia, which was in general terms seen as the 'cradle of the peoples'. A totally different view was argued in 1878 by Theodor Poeschke, who believed that the Indo-Europeans were blond and blue-eyed and thus must have come from the Baltic area. Karl Penka argued that southern Sweden was the original home of the blond and blue-eyed peoples. We see here how considerations originating in physical anthropology played a role. (The Indo-Europeans were formerly called 'Aryans' — a name that was only used by the Indo-Iranians — and scholars noted that the Indo-Europeans frequently formed the ruling class of the lands in which they settled. We can already see here the elements which the Nazis misused in developing their criminal and racist theories.)

'Linguistic paleontology', as it was called, was introduced by Pictet (1877): reconstructed words are used to give evidence for the things and situations which they represent. If PIE has a word for 'horse', we may safely assume that the Indo-Europeans knew the horse. This would seem to be self-evident, but the 'facts' which this method generates are themselves open to interpretation.

A much-discussed argument is the word for 'beech', PIE *$b^h eh_2 \acute{g}$- (Russ. *buziná*, Gr. *phēgós*, Lat. *fāgus*, OE *bōc*). Now it is a fact that the beech tree is not found east of the line that runs from Königsberg in East Prussia down to the Crimea. That would mean that the Indo-Europeans must have lived to the west of this line. This idea has met with the objection that such words may get another meaning, and could, in this case, be used to refer to some other tree. Gr. *phēgós* also means 'oak' and Russ. *buziná* also means 'elder tree' (the Slavic word here presents us with linguistic problems as well). To conclude, we cannot really be sure that 'beech' was the original referent of the word.

Indo-European was thought to have a word for 'sea', and this would mean that they lived on the perimeter of a sea: PIE *$mori$ (Lith. *māres*, OCS *morje*, Lat. *mare*, OIr. *muir*, Goth. *marei*). But it is equally possible that this word originally referred to an inland sea or a (large) lake. And in this case there is a second problem, namely that the word is only found in a particular region of the larger Indo-European area, in Central and in Western Europe, so that we may ask ourselves whether it is really of Proto-Indo-European origin. This problem, namely deciding whether a word that is not found in all of the languages is a PIE word, is a common one. It is possible that the languages which do not contain a word for 'sea' have simply lost it, but it is also possible that the other languages collectively borrowed it. (This last possibility is, however, less probable.)

A third problem is created by factual data. For example, PIE is thought to have had a word for 'salmon', *$lo\acute{k}sos$ (Toch B. *laks*, Lith. *lãšis*, Russ. *losós'*, OHG *lahs*). Now, salmon are only found in the rivers of northern Europe. But it was later observed that salmon are also found in the rivers of southern Russia. Often, too, the absence of words representing particular things has been used as an argument, but such an 'argumentum ex silentio' is always weak. Still, it *can* be valid, especially if it is confirmed by the absence of other words which come from the same field as the word in question. Clearly, there is a great deal of uncertainty with respect to the evaluation of these kinds of arguments. The different kinds of arguments put forward have resulted in different putative places of origin for the Indo-Europeans: Northern Europe, the Baltic area, Hungary, southern Russia.

Linguistic arguments of a very general kind are important, but they can only provide indications which are also very general. It seems not improbable that Indo-European is related to the Uralic family, which means that the two language families must have originated in fairly close proximity to each other. The fact that Indo-European had glottalized consonants (see Section 11.4.8), reminds one of the Caucasian languages. Both considerations would work very well with an original home in southern Russia. A problem with considerations of this kind is that we know almost nothing of the old languages of Europe. Of those languages, only the language of the Basques (which has nothing in common with the Indo-European family) has been preserved.

Ethnological arguments and those from the history of religion have been brought to bear on the question. It was argued, for example, that the Indo-Europeans had the custom of sacrificing horses, that their society was organized along patrilinear lines, and that they believed in a heavenly god, precisely as did the Altaic peoples. This congruency was used to support a (far) more easterly origin.

Gamkrelidze and Ivanov have argued that the 'Urheimat' of the Indo-Europeans must have been situated to the south of the Caucasus, and to the north of Mesopotamia. They base themselves chiefly on the existence of presumed loanwords from and into Semitic, South Caucasian (Kartvelian) and Hurrian. An important argument is that PIE had words for 'mountain,' so that the Indo-Europeans must have lived in a mountainous region. The names of trees would seem to suggest a southern latitude. Also, the names of animals, such as that for the panther, the lion and the elephant, would seem to exclude a northerly origin.

But this theory is in fact very improbable. The presumed loanwords are difficult to evaluate, because in order to do so the Semitic words and those of other languages would also have to be evaluated. The names of trees are notoriously unreliable as evidence. The words for panther, lion and elephant are probably incorrectly reconstructed as PIE words. The Lithuanian archeologist, Gimbutas, is probably right when she points out that the Neolithic culture of the proposed 'homeland' contradicts everything we know about the culture of the Indo-Europeans. The horse, in particular, only appears south of the Caucasus when kurgan people move there.

Extremely improbable is the theory of the British archeologist, Colin Renfrew, in his book *Archeology and Language* (1987). He proposes the idea that the Indo-Europeans came from Anatolia (Turkey) and that they brought agriculture with them. As of 6500 B.C. they are supposed to have crossed over to Greece by sea, and thence to have spread all over Europe. Essential to his argument is the idea that the Indo-Europeans moved very slowly across Europe; in his view, each new settlement was no further than 30 km. removed from the previous one. At this rate, agriculture would have reached England only in 4500 B.C.

This theory in fact is not based on any evidence, except that Renfrew can find no archeological support for large-scale migrations after this period. His theory happens to be contradicted by the linguistic and historical data which we have at our disposal, which is the reason why he must reject all the conclusions which have been reached by linguistic paleontology. By such a slow movement of settlement as Renfrew proposes we would expect that the various languages and dialects of the Indo-European peoples would have many loanwords, but this is not the case. A gradual split would suggest that there would be common developments among the different branches of the original language, so that, for example, Germanic and Celtic, which was the last to split off, would have shared a long period of common development; but this is not the case, either. Renfrew's theory does not only conflict with what we think we know

about the Indo-Europeans, but also with the whole picture we have built up around them. Quite apart from this, there is no positive evidence whatsoever that agriculture was introduced into Europe by the Indo-Europeans.

The 'facts' as suggested by linguistic paleontology don't give us very much to hold on to, but they do give us just enough. The fact that there are no words in Indo-European for plants and animals which are typically southern, such as the 'cypress tree' and the 'donkey', would certainly seem to suggest a place of origin that is not too southerly. The presence of 'copper' points toward the aeneolithic period. Important is that terms which point to the so-called "Secondary Products Revolution", such as 'wool', 'milking' and 'wagon', cannot lead us further back in time than about 4000 B.C. Because we already have Hittite from the 19th century and because the Greeks probably arrived in Greece in 2200 B.C., a date after 2500 B.C. would appear to be impossible.

It seems most likely that the homeland of the Indo-Europeans was somewhere in the center of the area into which they later expanded. When we further take into consideration the similarities between the Indo-European family of languages and the Uralic family, we are led to a homeland somewhere in Eastern Europe.

An essential clue is the word for 'horse', since it gives us concrete evidence to work with. The Near East, Turkey, and the Balkans did not yet have the horse in this period. In central and northern Europe its place was a marginal one. The home area of the wild horse and the place where it was first made tame (a word for 'taming' is known, PIE *$demh_2$-, Skt. *damáyati*, Gr. *dámnēmi*, Lat. *domāre*, Goth. *gatamnjan*, OIr. *damnaid*; although it was mainly used with reference to the bull) is the Pontic steppe area of south Russia, from the Dnieper to the Volga. Scholars have looked in this area for a long time in their attempts to locate the origin of the Indo-Europeans. Recently, Gimbutas has defended this theory: she saw the Indo-Europeans in the 'kurgan' cultures (a 'kurgan' is a burial mound or hillock).

Our knowledge of the archeology of Southern Russia has increased considerably in recent years. In the period which is of concern to us we find there the following cultures (see Mallory, 1989, esp. pp. 186–221): the Sredny Stog culture, 4500–3500 B.C., located around the middle and lower Dnieper until the Don, with the closely-related Novodanilovka culture located around the lower Donets and the Lower Mikhailovka-Kemi Oba group located on the lower Dnieper and in the Crimea. In the east, on the Volga, the Khvalynsk culture is comparable (Map 11). The Sredny Stog culture satisfies in all respects the picture we have of the Indo-Europeans. The people of this culture primarily supported themselves by means of cattle and stock breeding, alongside agriculture, hunting and fishing. They had horses, sheep, goats, cattle, pigs and dogs. Cheekpieces point to horse-riding, and the horse also played a role in rituals. The use of copper implements is still rare.

In a later phase we have the Yamnaya culture (formerly called 'Pit-grave' culture, in German 'Ockergrabkultur' — this is the 'kurgan' culture of Maria Gimbutas),

which stretched from the southern Bug over the river Ural. This is one of the largest prehistoric complexes in Europe, and scholars have been able to distinguish between different regions within it. It is dated from 3600–2200 B.C. In this culture, the use of copper for the making of various implements is more common. From about 3000 B.C. we begin to find evidence for the presence in this culture of two- and four-wheeled wagons. In the category of weapons we find daggers, arrowheads, stone axes and maces. The dead were buried in a pit (Russ. *yama* is 'pit', from which Yamnaya is derived), lying on the back with the knees drawn up. This characteristic style of burial remained in practice for a very long time, even when the Indo-Europeans had spread out far away from this original area. The grave was covered with a mound ('kurgan') (Map 12, with Figures 12a and 12b).

There seems to be no doubt that the Yamnaya culture represents the last phase of an Indo-European linguistic unity, although there were probably already significant dialectal differences within it.

The horse must have been of fundamental importance to the Indo-Europeans. It provided food, was very useful for hunting, for purposes of trade its value was high and it was, moreover, easily transportable. Its mobility made it possible for riders to cover very large areas, and this in turn made it possible to exploit the possibilities of the Russian steppes to their fullest, which would not have been possible without the transportation which the horse offered. In war, the horse could be used for the purpose of scouting and for sudden, very fast attacks and withdrawals. But it is not entirely clear whether the Indo-Europeans rode horses extensively in the earlier periods assigned to them; it seems that horse-riding did not become usual until a much later period.

The combined use of the horse and the ox-drawn wagon made the Indo-Europeans exceptionally mobile. It is therefore not surprising that they were able to migrate over such a very large area after having first taken possession of the steppes. We have already seen them in the Balkans in the fourth millennium, and in the far east, in the Afanasievo culture (as of 3000 B.C.). It remains for us to examine another great migration, that in the direction of northern Europe.

It has long been assumed that the Corded Ware culture (from 3300 to 2300 B.C., in German the 'Schnurkeramiker' of which the Battle Axe culture, the Single Grave Folk, the East Baltic and the Fatyanovo culture on the upper reaches of the Volga are all variants) from the middle Dnieper region and the upper Volga as far as Scandinavia and Holland, was developed by an Indo-European people. They would seem to have been nomads, their society was warlike, and they introduced both the horse and wagon. We find them in Holland as early as 3000 B.C., where they are clearly immigrants, and it is here that the earliest wheels of western Europe have been found. There is a problem in the fact that this culture is very early indeed when compared to the Yamnaya culture (3600–2200 B.C., although the Yamnaya may be still older), but

the central problem is the origin of Corded Ware. The Globular Amphorae culture ('Kugelamphoren' in German) preceded that of the Corded Ware (as of 3500 B.C.) in roughly the same area, though it extended in a more southerly direction and reached as far as the middle Dnieper and the Dniester. The relation between this culture and the Corded Ware culture is not clear, but it does seem probable that there was a relationship of some kind. The preceding Funnel-Beaker culture ('Trichterbecherkultur' or TRB in German) is of a totally different character. If we look for similarities, we can see that the Corded Ware culture most resembles the Yamnaya culture (although some scholars emphasize the differences), but it is not possible to show that it actually evolved from the Yamnaya culture; the area between the Vistula and Dnieper rivers, which possibly formed the physical link between these two cultures, is less well known to archeologists than other areas (Map 13, Map 10).

In any case, it seems very probable that the Corded Ware culture was an Indo-European culture. The fact that it was also different from the Yamnaya culture is no counter argument, nor is the fact that the physical link between them cannot (yet) be demonstrated by archeological means: such links can rapidly become invisible when a people are able to move quickly enough into a completely different area, where their culture had its own development. It is quite possible to conceive of the line from the Don in Russia to Holland in the west as a kind of continuous belt when one keeps to the north of the hilly areas in the south. A totally different problem here is of a purely linguistic nature: there is no linguistic complex, no North European language that we know of, that can answer to the profile of this culture. Probably the Corded Ware people were the predecessors of the Germanic, Celtic and Italic peoples, and, perhaps, of the Balto-Slavic peoples as well, and it may be the case that the linguistic unity which they must once have possessed was dissolved at such an early date that no evidence of a common linguistic development has remained.

Chapter 4

Sound Change

4.1   The sound law: The 'Ausnahmslosigkeit'

Sound change constitutes one of the most important forms of language change: it often leads to morphological changes (changes of form, see Section 8.2). It was in the 1860s that linguists began to see that sound changes in a language do not occur haphazardly, but rather according to regular rules. The Slavist, August Leskien, was one of the first to emphasize the 'Ausnahmslosigkeit der Lautgesetze' ('the regularity of the sound laws'). It is not an exaggeration to claim that it was this insight more than any other which laid the basis for comparative linguistics as we know it today. As we shall see, it has not been possible to demonstrate a similar operation of rules for morphological changes, nor for semantic or syntactic changes, and it is this which leads us to the conclusion that sound changes provide both the foundation and the main premise upon which comparative linguistics is built. Indeed, it is only by means of the sound laws that it is possible to *prove* that a particular explanation cannot be correct, for the sound laws are rule-governed and they do not allow exceptions.

It was observed that a certain sound in Sanskrit corresponded to another sound in Greek, Gothic and so forth, which was always the same sound. Comparative linguistics is actually based on the regularity of these correspondences. "Il n'y a que les correspondances," Meillet said; everything else is theory. It was concluded from the regularity of these correspondences that sound changes are governed by strict rules. Thus, an *o* in Greek always corresponds to an *a* in Sanskrit:

> Gr. *néphos* 'cloud' — Skt *nábhas*
> Gr. *ostéon* 'bone' — Skt. *ásthi*

The assumption arrived at is that *o* becomes *a* or vice versa, or that both sounds derive from a third, but the essential point is that this process always occurs in the same way.

Something which seemed to confirm this insight was the fact that apparent exceptions to the rule were themselves rule-governed. For example,

> Gr. *gónu* 'knee' — Skt. *jā́nu,*

shows us an exception, for the Greek *o* is here parallelled by a long *ā* in Sanskrit. But the exception was itself shown to be governed by a regular rule when it was noticed that an *o* at the end of a syllable in Greek always corresponded to an *ā* in Sanskrit

(Brugmann's law). The exception to the rule was governed by a rule which also had no exceptions. Compare the following (1 sg. = 1st person singular, and pf. = perfect):

Skt.	1 sg. pf.	*tatána*	cf. Gr.	*tétona*	'I stretched'
	3 sg.	*tatā́na*		*tétone*	

In the first form we would expect to see an *ā* in Sanskrit. The problem was solved when it appeared that the 1 sg. *-a* derived from *-h₂e* [-ʃe], that is to say, from a 'laryngeal', a consonant, followed by an *e*. Now there was no *o* any longer at the end of the syllable in the 1 sg. *te / ton / h₂e*.

Because the exceptions could all be explained, usually very simply, the conviction began to grow that *all* sound change is governed by rules: in fact, we can even use the term 'sound laws.'

The principle of regularity is criticized at regular intervals. Some linguists argue that there are always exceptions which are not governed by a rule, and this is indeed often the case: comparative linguistics happens to be a historical science, and it is not always possible to discover explanations for everything that has happened in history. For this reason, a useful discussion between both points of view is not really possible. One side will always push forward those examples of exceptions for which no rules have been found, while the other side, if it cannot provide a solution, will always come up with the same answer: the explanation simply still remains to be found, or will never be found, but there is an explanation.

Another attack on the principle of regularity has come from the field of dialectology. It was observed that sound changes spread, as it were, from word to word, and it seemed that they could stop at any given moment so that a sound might change in some words but remain the same in others. The answer to this problem is that the process of change will ultimately affect all words which the rule marks out for change. Comparative linguistics does not deal with languages still in the *process* of change, but rather, almost exclusively, with languages in which all change that could have taken place is now 'finalized' and 'at rest.'

Some words in a language are borrowed from related dialects, which either have undergone some change or none at all. An example is the Lat. word *bōs* 'cattle', which was borrowed from one of the Italic dialects in which *gʷ* became *b*. The word goes back to PIE *gʷōus*, which would have had a *g-* in Latin itself. Borrowings of this kind do not in the least obviate the principle of regularity with respect to sound change, although it is admittedly sometimes very difficult to distinguish between a sound law and a borrowing.

A sound law often disturbs the morphological system of a language, and it is a natural phenomenon that such disturbances within the system are eventually eliminated on the analogy of other forms. As a case in point, the *s*-aorist in Greek (which is formed by adding an *s* to the root) should have lost the *s* between vowels, on which

basis *lúō* should have obtained an aorist **é-lū-a* < **e-lū-s-a*. Here the *s* is restored, *é-lūsa*, analogically to *é-deik-s-a*, for example, where the *s* was not situated between vowels. Such an analogical restoration of form is frequently seen, and it is therefore often difficult to make out what the relevant sound law was and which sound change actually took place. But this is yet another example of a complicating factor which in itself does not obviate, or invalidate, the regular application of the sound law system (for more on *analogy* in comparative linguistics, see Chapter 5 below).

4.2   Sporadic sound changes

There are some examples of sporadic sound changes, that is to say, of sound changes which only took place in specific instances and sometimes even only once.

The most frequently found changes of this kind are instances of dissimilation, as in Lat. *peregrīnus* 'foreigner' > *pelegrīnus* (E. *pilgrim*). Lat. *carmen* 'song' is supposed to have come out of **can-men*. In Gr. *éeipon* 'I said' < * h_1*e-ue-uk^w-om* (Skt. *ávocam*) the second *u* has been dissimilated to an *i*. The apparent irregularity of these developments is at least in part due to the fact that the very same group of sounds (here *u-uk^w* or *u-up*) are seldom found together.

'Anticipation' is a term we could use to describe the phenomenon of a sound jumping, as it were, from one place to another: Gr. *egrégora* 'I am awake' came from **egēgora* (< **$h_1$ge-$h_1$gor-h_2e*, from the root **h_1g(e)r-* which we see in *egeírō* 'to awaken' < **eger-yō*).

Metathesis (changing of position) is sometimes found only in a single word, for example Du. *wesp / weps* (E. *wasp*). But it is sometimes also found as a regular process (see Section 4.8.5).

Haplology (saying something once instead of twice) is seldom found because the necessary conditions for its appearance seldom occur. Gr. *amphoreús* 'amphora', a jug with two ears, < Hom. *amphiphoreús* (*amphi* 'on both sides', *phor-* 'carry') is an example.

Onomatopoeias (words which imitate sounds) and other expressive words often resist compliance with the sound laws. A nice example of this is (O)Gr. *bē* [*bɛ̄*], the sound that goats make. The relevant sound law would now require this to be **vi*, but it naturally continues to be [*bɛ̄*].

Words which very frequently occur sometimes exhibit unusual 'wear and tear', for example, Lat. *nōn* 'not' < **ne oinom* 'not one'; *nihil* < **ne hīlum*, G. *nur* 'only' < MHG *ne wære* < OHG *ni wāri* 'were it not'.

As we have seen, these are incidental changes which are caused by exceptional situations (they never actually produce a new phoneme). It is noteworthy that changes of this kind usually involve a 'jump' by which one sound replaces another. These phenomena are distinct from the regular patterns of rule-governed sound change, and, again, do not in any way invalidate them.

4.3   The sound laws: Place and time (isoglosses and relative chronology)

A sound law is always limited to a particular area, whether that area encompasses all speakers of a language or only some of them. The latter case explains how dialects develop; the boundary between different dialects, the imaginary line beyond which a particular sound law does not extend, is called an 'isogloss.' Often, an isogloss follows a natural boundary such as a river or a mountain range; sometimes, too, a number of different isoglosses run neatly parallel with each other, and together, they form, as we have stated, the boundary between one or more dialects. It is not usual, however, for many isoglosses between two dialects to run exactly parallel: that is why transitional areas between dialects are often found along their borders. Of couse, for us who work with historical written data, such transitional areas usually cannot be recovered.

A sound law is also restricted to a particular period in time, a fact which enables us to solve apparent problems with which we sometimes are confronted. In Greek, for example, an *s* was lost between vowels (via *h*), as in

gen. sg. *méne-os* 'of the willpower' < PIE * *ménes-os*, cf. Skt. *mánas-as*

How, then, is it possible to get a word such as *tísis* 'revenge', where we do see an *s* between vowels? The explanation is that the *s* originated in this word *after* the sound law in question had its effect: *tísis* was formed from *k^wi-ti-s*, cf. Skt. *cí-ti-*. We can for this reason formulate a (relative) chronology to explain what has happened:

1. *s* > Ø between vowels;
2. *t* > *s* (before *i* …).

It is moreover possible that both of these changes took place simultaneously, but then in such a way that the results did not become identical at one and the same time.

4.4   The sound law: Conditioning

It is often the case that sound changes are dependent on the existence of a particular 'sound context.' The development *t* > *s* in Greek only took place before an *i*, and never after an *s*. Cf. *és-ti* 'he is', but *phē-sí*, 'he says.'

Each development is specific to a particular language. Accordingly, in West Germanic a short vowel in the second syllable of a word disappeared (this is called syncope) after a long syllable, while in Old Norse the same phenomenon also took place after a short syllable:

Goth. *hausida*   'I heard', OHG *hōrta*, ON *heyrþa* (**hau-* was a long syllable)
Goth. *nasida* 'I saved', OHG *nerita*, but ON *talþa* (< **taliþa*) (**na-*, **ta-* were short syllables)

These changes are called conditioned or combinatory changes.

Most changes are of the above, conditioned variety, but there are also unconditioned changes. In Proto-Germanic each PIE **o* becomes an *a*: Goth. *gasts* 'stranger, guest' — Lat. *hostis* 'enemy', OCS *gostь*; PIE **gʰostis*. This development was not subject to any kind of limitation.

Some linguists believe that grammatical conditioning of a sound law is possible: a sound law only operates (or does not operate) in such and such a grammatical category. This is how they explain the fact (to take one example) that an -*i* does not disappear in the abl. sg. of Latin, but the explanation is incorrect. What seems to be a case in point for this theory is in fact an example of what is called 'analogy' (see Chapter 5), and there may even be other factors at work which we are unaware of. A sound law can only be conditioned by sound elements, i.e. phonetically.

In this respect the position of a sound element in a word as well as some morpheme boundaries are to be seen as phonetic factors. We can illustrate this process with a few examples.

Sounds at the end of a word, or in its final syllable, are often subject to changes which do not take place elsewhere in a word. In its 'auslaut' (i.e. at the end of a word) Sanskrit cannot have more than one consonant: *ábhār* 'he carried' < **á-bhār-s-t* (*s*-aor.). In Avestan, there is no opposition between short and long vowels in absolute word-final position (OAv. always has a long vowel -*ā*, -*ū* or -*ī*, YAv. always a short vowel), though short and long vowels are distinct in all other positions.

In languages which are characterized by a heavy accent at the beginning of words we sometimes see a difference between the second and third syllables. Syllable length sometimes also had a role to play. In West Germanic the *i* and *u* in the last syllable (when it was the second syllable) disappeared after a long syllable but not after a short one: OHG *gast* < **gastiz*, but *wini* 'friend' < **u̯iniz*. In the third syllable they always disappeared. Words in pro- or in enclisis (which lost their own accent to the following or preceding word) show their own development. Thus, in Old Irish a *t* becomes a *d*, an *e* becomes an *a* in proclisis, while they otherwise remain unchanged: *do-beir* 'he gives' < **to-*; *as-beir* 'he says' < **e(k)s-*. The beginning and the end of a word is a special case of a morpheme boundary. Another case in which a morpheme boundary had a role to play can be seen in Gr. *makrós* 'long' < **mh₂ḱrós*, but *néǵretos* 'from which one cannot be awoken' < **n̥-h₁gr-etos*, where nasal (*m*, *n*) + laryngeal (*h₁*, etc.) show different developments: in the first of these cases the laryngeal becomes a vowel, while in the second the nasal is vocalic because it is immediately followed by a heavy morpheme boundary, and we find the (normal) development *n̥h₁ > nē*.

4.5   The sound law: Formulation

It is possible to provide a notation for sound changes by indicating which phonemes changed into which other phonemes, for example a part of the umlaut in Old Norse:

> *o, u* > *ö, ü* before *i, j*

In such a formula the sign > indicates 'changed into, became'; the reverse sign, <, means 'changed from'; in both cases the sign which is used is that of the abbreviated arrow. One may also notate 'before *i, j*': /_*i, j*, which is sometimes easy.

Here are some more examples:

> Lat. *al* > Sp. *o* /_*t* = Latin *al* becomes Spanish *o* before *t*
>> e.g. Sp. *soto* 'row of trees' < *saltus*, Sp. *otro* 'other' < *alter*
> Skt. *a* < PIE **e, *o, *n, *m* = Sanskrit *a* can reflect PIE **e, *o, *n, *m*
>> e.g. Skt. *-ca* 'and' < **-kʷe*, Skt. *sá* 'he' < **so*, Skt. *a-* 'un-' < **n-*, Skt. *saptá* < **septm*
> WGmc. **f* > Du. χ /*V*_*t* = West Germanic **f* becomes Dutch χ between a vowel (*V*) and *t*
>> e.g. Du. *lucht* (G. *Luft*) 'air', *gekocht* (G. *gekauft*) 'bought' (the sound χ is spelled *ch* in Dutch)

4.6   Phonemicization of changes

Many changes in the development of a language are purely phonetic in nature and are caused by adjacent sounds but without any phonemic change occurring. Thus, the *a* in E. *pan* is much longer than the *a* in *pat*, the difference being explained by the influence of the following *n* and *t*, respectively. But the difference is an *automatic* one: we will *always* find the longer form of the *a*-sound before the *n* (and other voiced consonants), and the shorter form will *always* appear before *t* (and *p* and *k*). These differences are called 'allophonic' (that is to say, they show two different allophones = forms of the same phoneme) and therefore the change in question is only 'allophonic' or subphonemic. In the example we just gave the two *a*'s could be exchanged with each other and the result would sound a bit strange, but no harm done. However, should, for example, the *p* in these word be exchanged with an *r*, a problem would directly arise because a whole new word would result. This is because the *p* and the *r* are phonemes in English, whereas the two *a*'s are not.

In a later phase of development these allophones can become independent phonemes. The most famous instance of this is the development of the *k* (from PIE **kʷ*) in Sanskrit. Before an *e* or an *i* the *k* became a *c*. In this phase the change is still sub-

phonemic: before *e* and *i* the *k* is simply pronounced differently, but the distribution still is automatic. That changed when *e* and *o* both became *a*. Then *ko* > *ka* and *ce* > *ca*. Now the distribution *k* : *c* no longer depends on the following vowel and the *k* and the *c* have become two independent sounds: they have become two phonemes and the difference between them has become phonologized. Compare

> Skt. *kád* 'what' — Lat. *quod*; PIE *$*k^wod$
> Skt. *-ca* 'and' — Lat. *-que*; PIE *$*-k^we$

The discovery that *-ca* derives from *$*-k^we$, which was made in the 1870s, was especially important for our understanding of the history of Indo-European because it showed that the *e* and *o* were older than the single *a* of Sanskrit. Before then scholars believed, because Sanskrit was so archaic, that the other languages had developed out of a system such as that of Sanskrit, which only has *a*, *i* and *u* as vowels.

As we have seen, a change which originally had been phonetic in nature became, by means of a later development (*e* > *a*), a phonological change. It is only phonological changes which are relevant for a language system. Note that phonetic/subphonemic changes are usually not written, as is the case with E. *pan* and *pat*.

4.7   Types of sound change and the phonemic system

According to their effect on the phonemic system of a language we may distinguish the following possible sound changes:

1.   Change: A > B
A phoneme (A) becomes a new phoneme (B) which did not previously exist. However strange it may sound, this actually occurs very rarely. It is even possible to say that for the phonemic system itself nothing changes: at the very same places one finds one phoneme (thus A_1 > A_2). Still, it seems useful to assume the existence of this kind of development, for example for PIE *$*k̑$ > Skt. *ś*: PIE *$*k̑mtóm$ 'hundred' > Skt. *śatám*. Sanskrit did not have the *ś* sound before. Or, for PIE *$*h_2$ > Gr. *a*: *$*ph_2tḗr$ 'father' > *patḗr*. Here we see a consonantal phoneme which has become a vowel.

2.   Merger (with an existing phoneme): A, B > B
We have already seen that Proto-Germanic *o* merged completely with *a* (see Section 4.4). In Indo-Iranian, *l* became *r*. Skt. *raghú-* 'fast' — Gr. *elakhús* 'slight', OHG *lungar* 'fast'; PIE *$*h_1lngʰú-$.

3.   Loss: A > Ø
(Ø is 'zero' or 'nothing.') A *p* disappeared in Celtic: PIE *$*ph_2tḗr$ > OIr. *athir*. This kind of development does not occur very often.

4.   Splits: A > A, B or A > B, C(, D, etc.)

Here there are a number of different possibilities. Firstly, A can either remain partly unchanged (A > A, B) or disappear itself (A > B, C). An example of the first possibility is the development of *s* to *r* between vowels in Latin: *genus*, gen. *gener-is* < **genes-es*. The *s* remains in other cases.

Secondly, for B and C the same possibilities exist as named under 1–3:

- B merges with an existing phoneme, as is the case with the *r* in the Latin example above.
- B becomes a new phoneme in the language. Thus the *c* in Sanskrit from *k* before *e*, *i* (see Section 4.6).
- One of the results is zero (Ø). An example in Greek is the *s* between vowels (it remained in all other positions).

A split can also lead to three or more results. For instance, PIE **kʷ* in Greek gave *k* before or after *u* and before *i̯*; *t* before *e*, *i*; and *p* elsewhere. The root **kʷel* 'turn itself' is found in:

> *téllomai* 'to turn around in circles' — Lat. *colō* 'to inhabit' < **kʷel-*; *t* before *e*
> *boukólos* 'cowherder' — OIr. *búachaill* < **gʷou-kʷolos*; *k* after *u*
> *aipólos* 'goatherder' and *amphípolos* 'female servant'; *p* in other positions

Developments of this kind often take place in distinct steps. We know, for example, that the development which gave *k* before or after *u* had already taken place in Mycenaean (*qoukoro* = /*gʷ oukolos*/), while elsewhere the labiovelar was preserved (*apiqoro* = /*amphikʷolos*/). Perhaps the labiovelar had already become *k* in Proto-Indo-European before and after *u*.

5.   Emergence (among which epenthesis, excrescence): Ø > A

Here a phoneme simply comes into being where there was none before. The genitive of Gr. *anḗr* 'man' is *andrós* < **anros*: a sound comes into being between the *n* and the *r*. The perfect of Lat. *sum-ō* is *sumpsī* < **sum-sī*. Note that the new consonant is homorganic — produced with the same organs of speech — with the preceding. This is called 'excrescence'.

A vowel sometimes appears at the beginning of a word before certain consonants and consonant-groups: PIE **bʰreh₂tḗr* 'brother' > **brātēr* > Arm. *ełbayr* (with *br-* > *bł-* > *łb-*).

If a vowel appears between consonants, we speak of anaptyxis or epenthesis. This happens for example in a consonant group, as in Lat. *stabulum* 'stall' < **stablom* (< **sth₂dʰ-lom*). We often find it before a sonant which had become vocalic: *sacerdōs* 'priest' < **sakrdōs* (< **sakro-dʰoh₁-t-s*); *ager* 'acre' < **agr* (< **agros*); thus OE *æcer*, cf. Goth. *akrs* (< **agros* < PIE **h₂eǵros*). The vocalization mostly yields *Vr* or *rV*, etc. (V =

vowel). For example, PIE *$mrtó$- 'dead', Skt. $mrtá$-, but Lat. *mortuus*, Gr. Aeol. *brotós*, Lith. *mir̃ti* 'to die', etc. No phoneme emerges which the language did not already have.

4.8 Phonetic classification of sound changes: Consonants

We can only give a few examples here, for the total number of sound changes is very great. There is no room for a detailed description of the phonetic processes involved. Another reminder is in order: all of our examples are taken from the Indo-European family of languages, whereas many sound changes in other language families show developments which hardly, if ever, occur among the Indo-European languages.

Most sound changes are conditioned by phonetic factors: the nature of the preceding or following vowels or consonants, the position with regard to the word stress or a tonal feature, etc. As to their phonetic (and/or acoustic) motivation we can subdivide sound changes in a restricted number of groups: assimilation, deletion, insertion (these are the most common kinds), dissimilation, metathesis. This section will deal with the consonants, the vowels will be described in Sections 4.9 and 4.10 below.

4.8.1 Assimilation

One sound becomes more similar in pronunciation to another one, or both move in each other's direction. The sounds can be directly adjacent or occurring at some distance within the same word or phrase.

In Old English *stemn*, OHG *stimma*, Dutch *stem* 'voice', we find assimilation of *bn* to *mn* (labial stop becoming labial nasal) and further to *mm* (the two nasals merging); the original combination *bn* is found in Goth. *stibna* 'voice'.

The PIE *k^w lost its labial articulation before *o* or *u* in Latin: *cum*, OLat. *quom* < *$k^w om$; *colō* 'I take care of' < *$k^w olō$ < PIE *$k^w elō$ (compare Hom. Aeol. *pélomai*). Here, the assimilation of ^{w} to the following *o* is complete. This change may of course have an interpretative background: the timing of the liprounding in $k^w o$- was reinterpreted as *ko*-.

Palatalization of *k* to *c* before *e* or *i* as in Sanskrit implies the shift of *k* to the more forward position of the following vowel. For example Skt. *rócate* 'to shine' < *$leuk$-e- (Hitt. *lukk*-, Gr. *leukós* 'white'), *cid* ' even, -ever' < *$k^w id$ (Lat. *quid*).

A frequent change is the voicing of voiceless stops between vowels or resonants: *b* < *p* in Sp. *saber* 'to know' < Lat. *sapere*, *z* < *s* in Dutch *kiezen*, English *choose* [z] < *keu-*san*-. The voiceless *p* and *s* have taken over voicedness from the surrounding vowels. This phenomenon is often called lenition or weakening.

The change of stops to fricatives before another consonant, as in Iranian, can also be regarded as an assimilatory process, by which the obstruent cedes to a continuing

sound (a fricative) and thus becomes more similar to the surrounding vowels and resonants. For example, Avestan *θ* < *t* in *miθra-*, Skt. *mitrá-* 'treaty', Av. *f* < *p* in *afnah-*, Skt. *ápnas-* 'property'.

It often happens that a voiced consonant in auslaut becomes unvoiced, as in German (*Pferd* 'horse' [-*t*]), Dutch (*paard* [-*t*]), Russian (*Sankt-Peterburg* 'Saint Petersburg' [-*k*]), etc. This change may be imagined as an assimilation to utterance-final or prepausal position, when the vocal cords stop vibrating.

4.8.2   Deletion

This means that a sound disappears completely. We have already seen examples of *p* > Ø and *s* > Ø (see Sections 4.7 and 4.3). The PIE laryngeals (*h₁*, etc.; see Section 11.8) often became zero: Lith. *vém-ti* 'vomit' < **uemh₁-ti* — Gr. (aor.) *emé-sai* (with *h₁* > *e*).

Loss often occurs at the end of words. In Ancient Greek a word-final *-t* disappears, as in Gr. *éphere* 'he carried' — Skt. *ábharat*. In French, final *-s* is still written as *-s* or *-x*, but it has disappeared from the pronunciation many centuries ago: *mot – mots* 'word – words', *jeu – jeux* 'game – games' (except in some contexts before a following vowel: *faux amis* [*foz ami*] 'false friends').

4.8.3   Insertion

This is the coming into existence of a phoneme in a place where there was none before. Examples have already been given in the preceding section (4.7, nr. 5).

4.8.4   Dissimilation

By dissimilation two sounds become less similar to each other. The sounds can be in direct contact, but dissimiliation is relatively frequent between more distant sounds. It is much less regular than assimilation and therefore not often captured in sound laws.

Dissimilation is especially frequent with the liquids. In Latin, a suffix containing *l* will change the *l* into *r* if the stem of the word already contains an *l*. Thus, besides *nāt-ālis* 'of birth' and *mort-ālis* 'mortal' we find *mīlit-āris* 'of soldiers' and *popul-āris* 'of the people'; besides *amā-bilis* 'loveable' and *laudā-bilis* 'praiseworthy' we find *salū-bris* 'healthy'.

4.8.5   Metathesis

When two sounds switch places within the word, this is called metathesis. Some cases of metathesis can be described as sound laws, but many are more sporadic. In the Slavic languages, for example, we find metathesis of *VR* to *RV* before a consonant, as

in OCS *gradъ* 'city' (*ra* < *rā* < *rō* < *or*) < *$g^h ord^h$*-, compare Lith. *gar̃das*, Goth. *gards* 'house' (OE *geard*, E. *yard*). In Ossetic, *θr* is metathesized to *rt*, e.g. Oss. (Digoron dialect) *furt* 'son' < Old Iranian *$pu θra$*-, Oss. *cirt* 'grave' < *$ciθra$*-, *art* 'fire' < *$ā θr$*-.

4.9 Phonetic classification of sound changes: Short vowels

The appearance of a vowel in a position where there was none before (anaptyxis, sometimes called epenthesis — see Section 4.7), and the disappearance of vowels (syncope, apocope — see Section 4.4) have already been discussed.

It is very useful to consider vowel changes in the context of the entire vowel system of a language. In order to do this we may show the vowels in the form of a so-called 'vowel triangle' which basically corresponds to the position of the tongue. The most common vowels are the following:

front →	back →		
	rounded →		
i		*u*	high/closed
e	*ə*	*o*	
	a		low/open
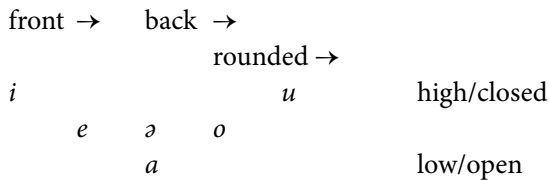
(*ə* as the *e* in E. *open* — a more extensive diagram can be found at the back of the book).

The *u* and *o* are articulated with rounded lips; they are 'rounded'. *i* and *e* are front vowels, while the others are back vowels. When sound changes take place a vowel shifts its place within this triangle, or another vowel enters the triangle which had not been there before.

Unconditioned are *o* > PGm. *a* (see Section 4.4); or Goth. *e* > *i*: Goth. *itan* 'to eat', OS *etan*, Lat. *edō*, PIE *$h_1 ed$*-. In both cases merger has taken place with a neighboring vowel. In Sanskrit, *e* and *o* merged in *a*, which was phonetically more like an *ə*.

Most changes are conditioned: by the stress, by a following vowel, by a preceding or following consonant, or by some combination of these. It is useful to look at some developments which took place in the vowel system of Latin, because that language allows us to illustrate very many developments indeed. In the first place we should note that vowels behaved differently according to whether they were found in an initial syllable, a middle syllable or a final syllable — and in the last two of these cases, according to whether they were found in open or closed syllables. They are always heavily influenced by the consonants and vowels which surround them. Latin vowels are thus very 'sensitive', while, for example, Greek shows no such phenomenon: languages can differ enormously from each other. The situation of Latin can for a large part be explained by the presumed presence of a strong initial accent at an earlier stage. Try to follow the changes in the vowel-triangle.

In the first syllable we find, among other changes:

i > *e* and *u* > *o* before *r*; the *r* has a lowering effect, *serō* 'to sow' < **si-sh$_1$-ō*, cf. pf. *sē-vī* < **seh$_1$-*; *fore* 'shall be' < **fu-se*, cf. *futūrus*.
e > *o* before *u̯, ł, mo* and after *u̯* before *Co* (consonant+o). *novus* 'new' < **neuos* — Gr. *néos*; *volō* 'I will' < **vel-ō*, cf. subj. *velim* (*ł* is a velar *l*; before *i* and *e* a Lat. *l* is not velar); *homō* 'human' < **dʰǵʰemōn*, cf. *nēmō* 'no one' < **ne-hemō* (a long *ē* remained unchanged); *bonus* 'good' < OLat. *duenos*, cf. adv. *bene*. We see, then, that *e* becomes a rounded vowel (*o*) before *u̯*, and after *u̯* if the following syllable contained an *o*; before a labial sonant (*m*) if followed by an *o*; and before an *l* unless followed by a front vowel.
o > *u* before *m*: *humus* 'earth' < *dʰǵʰom-*, Gr. *khthon-*.

These illustrations give us a good idea of how complicated such developments can be and it should now be obvious why it is not so easy to discover them.

In closed medial syllables *a* > *e* and *o* > *u*; in both cases we have 'raising'; see the vowel-triangle. Cf. *faciō*: *confectus*; gen. *euntis* 'going on' < **-ont-*.

In closed final syllables *a* > *e*, *e* > *i*, *o* > *u*. This is, then, parallel to the preceding, but with the addition of *e* > *i*. *tībīcen*, 'flute player' < **-kan* (cf. *canō* 'to sing'); 2 pl. *legitis* < **-te-s*; 3 sg. pass. *legi-tur* < **-to-r*.

Most interesting of all are the developments in open medial syllable, where all vowels merged in an *i*-sound, initially, [*I*], as in E. *pit*, which (disappeared due to syncope or) later became *i*, but in different positions became *u*, *e*, or *o*:

u/_ *u̯*: *abluō* 'to wash off', cf. *lavō*;
 /_ *ł*: *simulō* 'to make the same', cf. *similis*;
 / _ labial + back vowel: *occupō* 'to occupy', cf. *capiō*;
e/_ *r*: gen. *veteris* 'old' < **uetus-* (lowering because of *r*);
 /*i*_ : *pietās* 'piety' < **pio-*, through dissimilation with respect to *i*.
o/*i* _ *ł*: *filiolus* 'little son' < **-elo-s*. Here the effect of the *i* (whence *i* > *e*) is combined with (or followed by) rounding due to the *ł*.

Changes which occur on account of the influence exerted by the following vowels are often referred to as 'umlaut'. Compare the vowels of Old Norse:

i   *y*   *u*
                          o
     e   *ø*
                     ǫ
               a
(*ǫ* = *ɔ̄*; *y* = *ü*; *ø* = *ö* as *eu* in Fr. *peu*)

The basic line of development of the *i*-umlaut, caused by *i* (or *j*), is: *a* > *e*; *u* > *y*; *o* > ø. The vowels thus all move in the direction of the *i*, for example *gestr* 'guest' < PGm. **gastiR, fylla* 'to fill' < **fulljan; kømr* 'you come' < **komiR.* The rules also apply to combinations = diphthongs, for example *au* > *ey*: *leysa* 'to loosen' < **lausjan.*

The *u*-umlaut, caused by *u* (or *w*), works, among other ways, as follows: *a* > *ǫ*; *e* > ø; *i* > *y*. The vowels shift in the direction of the *u*. The phoneme *ǫ* came into existence due to this umlaut. The long vowels changed in a parallel fashion because of the umlaut, too.

The details are all complicated. Thus there is a difference between umlaut caused by a syncopated *i, u* and one caused by an *i, u* which has been preserved, and between umlaut caused by *i, u* after long and after short syllables.

'Breaking' is the term applied to the diphthongization of a short vowel, for example ON *e* > *ea* > *ia* before syncopated *a*, and *e* > *eo* > *io* > *iǫ* before syncopated *u*, for example **heldaR* > *hialdr* 'battle'; **erþu* > *iǫrþ* 'earth'.

'Nasalization' occurs whenever a following nasal disappears as an independent (oral) consonant and the vowel takes over the nasal articulation: OCS *pǫtь* 'way' — Gr. *póntos* < **pont-; pętь* 'fifth' — Lith. *peñktas* < **penkʷ-tos.*

For the phenomena of lengthening and contraction see the following section.

4.10 Phonetic classification of sound changes: Long vowels and diphthongs

An example of unconditioned change is, for example, the transition *ē* > *ī*, seen in OIr. *rí* 'king' — Lat. *rēx.*

Conditioned changes lead to splits. In Old Irish *ō* became *ā*, but in final syllable, *ū*: *dán* 'gift' (*á* is a long vowel) — Lat. *dōnum; siur* 'sister' < **suesōr* — Lat. *soror* (< *-ōr*).

Diphthongization of long vowels: *ō* > Lith. *uo*, OLith. *nepuotis* 'grandson' < **nepōts*, Lat. *nepōs.*

Shortening often occurs in final syllables: *-ām* > Lat. *-am*, acc. sg. *aquam* 'water'; **-ōr* > Lat. *-or, ōrātor* 'public speaker'. Before an *s* the length is often preserved (in languages where shortening occurs before other consonants): **-ās* = Lat. *-ās*, gen. sg. *familiās*; Goth. *-os* (*o* = *ō* < *ā*), *gibos* 'of the gift'.

Shortening is also found before consonant groups, thus before RC (sonant + consonant) in different languages (Osthoff's Law): Gr. *Zeús* < **Diēus* — Skt. *Dyáus* (*au* < *ēu*); Goth. *winds*, Lat. *ventus* 'wind' < **uēnto-* (< PIE **h₂ueh₁nto-*).

New long vowels can arise due to contraction, due to the lengthening of short vowels and due to the monophthongization of diphthongs.

Contraction usually occurs after the disappearance of a consonant, for example Lat. nom. pl. *cīv-ēs* 'citizens' < **-ej-es*; Gr. nom. pl. *basilēs* 'kings' < ** -ēwes*, cf. nom. sg. *basileús* (< **-ēus*).

Lengthening of a short vowel occurs most often after the disappearance of a following consonant, the so-called 'compensatory lengthening'. Thus, in Latin after the disappearance of *z* < *s*: *īdem* 'the same' < **is-dem*; *sīdō* 'to make sit' < **si-sd-ō*, cf. *sedeō* 'to sit.' Thus in Greek: *eimí* 'I am' (*ei* = *ē*) < **h₁esmi* (see Section 2.2). Greek has three more types of lengthening. Before *-ns-*, ptc. fem. *lúousa* 'loosening' (*ou* = *ō*) < **-onsa* < **-ont-i̯a*, cf. gen. masc. *lúont-os*. Lengthening of *e, i, u,* before *r̥i, n̥i*: *phtheirō* (*ei* = *ē*) < **phtheri̯ō*. Before *Ru̯* (R = resonant), Ion. *kālós* 'beautiful' < **kalu̯os*, Boeot. *kalu̯os* (no lengthening in Attic: *kălós*). When a nasal consonant disappears a nasalized vowel first takes its place which often changes into a long, denasalized vowel. In Germanic *n* disappears before *χ* with lengthening: **branχ-t-* > Goth., OS, OHG *brāhta* 'he brought'. This is how a new long *ā* came into existence in Germanic (the old one became *ō*).

Compensatory lengthening sometimes occurs in cases of metathesis, for example OCS *gradъ* 'city' (*a* < *ā* < *ō*) < **gʰordʰ-* (see Section 4.8.3).

Lengthening also sometimes occurs in monosyllables: Lat. *fūr* 'thief', Gr. *phṓr* (Lat. **fōr* > *for* > *fur* > *fūr*).

Monophthongization of diphthongs takes place when one of two components or both shift in the direction of the other (see the vowel-triangle in the preceding section). So an *ei* often becomes an *ī* (that is to say, *ii*), an *ou* becomes *ū*, for example in Latin *dīcō* 'to say', OLat. *deicō*, cf. Gr. *deíknūmi* 'to point out'; *dūcō* 'to lead', OLat. *doucō*.

PII **ai* > *ē* (the *e* is found in between the *a* and the *i* in the vowel triangle) and *au* > *ō*, so Skt. *éti* 'he goes' < **aiti* < PIE **h₁eiti* (Skt. *e* = *ē*), Gr. *eîsi*; *loká-* 'space, world' < **loukos* (Skt. *o* = *ō*), Lat. *lūcus*, OLat. *loucom* 'sacred grove', OHG *lōh* (cf. *Waterloo*). PIE **oi* becomes OCS *ě* [ɛ], *sněgъ* 'snow' < **snoigʷʰos*, Goth. *snaiws*.

A new long vowel may or may not merge with an existing vowel. In Greek an *ē* that was monophthongized from *ei* (though it was still written as *ei*) did not merge with the old *ē* ([ɛ], written *ē*). The lengthened *e* mentioned above merged in Ionic-Attic with this new *ē*, but in Doric with the old *ē*: Ion. Att. *eimí*, Cret. *ēmí* < **h₁esmi*. In Germanic a new *ē* came into existence, the *ē₂* which originated from *ei* before *a*, a sound which merged with old *ē* in Gothic but not in other languages: pret. ON *hét*, OHG *hiaz* 'I am named' (the old *ē* in the other languages became *ā*).

Diphthongs often show assimilation of both components. This can lead to (monophthongized) long vowels (see above) or to a less radical result. Thus we get:

eu often becomes *ou*, as for example OLat. *doucō* 'transport' < **deuk-*. Goth. *tiuhan*.

ai becomes *ae*, Lat. *Rōmae* 'at Rome'. In Avestan, PII **ai* yields *aē* in open syllables but *ōi* < **əi* in closed ones: *aēuua-* 'one' < **aiwa-* but *šōiθra-* 'dwelling' < **šaitra-*.

au becomes *ao* in Avestan (with lowering of the *u*): *aogō* 'power' — Lat. *augeō* 'to increase'.

4.11   Causes of sound change

Finally we come to the question of why sounds undergo change at all. To begin with, we must distinguish between factors which are inherent to a language and those which are external to it.

One of the inherent factors which has a role to play is the tendency for sound change to make the pronunciation easier for the speaker: this is certainly an important factor in many cases of sound change. Whenever features disappear, whenever assimilation makes two features identical, fewer articulatory movements are necessary; such developments justify the theory of easier pronunciation as a probable cause of sound change. On the other hand, there are many examples of sound change which cannot be explained on this basis, as for example in cases where diphthongization has taken place.

It is equally certain that stress is often an important cause of sound change. In the Germanic languages it is the strong initial accent which has caused syncope and the weakening or entire disappearance of final syllables. Again, however, there are many sound changes which cannot be explained on this basis, either.

A very important factor that underlies sound change is the phonemic system. We often notice that whenever it displays a 'gap', the gap tends to be filled up, that is, the asymmetries in the system tend to be made regular through time. The Dutch language, for example, has $t : d$, $p : b$, but no g next to k (Du. g is a spirant, g). Still, it does not look like this could be a cause of sound changes. In the first place, there are phonemic systems with 'gaps' which have continued in that way for a long time without problems, as in the Dutch example. An instructive case is the Greek vowel system. Because in Ionic-Attic u, $\bar{u}$ became $ü$, $\bar{ü}$, an asymmetrical system came into being (the forms in parentheses came into existence later):

i	$ü$		$\bar{\imath}$	$\bar{\bar{u}}$		($\bar{u}< ou$)
e	o		($\bar{e}$)			
a			$\bar{\varepsilon}$	$\bar{\mathcal{ɔ}}$		
			$\bar{a}$			

Because of the monophthongization of ei an $\bar{e}$ came into being (written as ei). One would then expect $\bar{o}$ to develop out of ou (which would give symmetrical $\bar{e} : \bar{o}$). It is quite easy to understand, however, that (ou >) $\bar{o}$ became $\bar{u}$, because the change achieves 'maximum differentiation', which is to say, the most efficient possible use of the available physical space whereby differences are as great as possible and the sounds thus as clear as possible. In this way an asymmetrical 'gap' came into being besides the new $\bar{e}$. This would only be eliminated in the late-classical period when the opposition long : short disappeared, and [among other changes] the long e sounds became i so that only one e remained.

In the second place it is difficult to see how the desired *result* could be the *cause* of sound changes. It does seem that sound change is made easier when a 'gap' exists in the phonemic system. In Dutch there could be an allophone *g* which in this situation 'would like' to become phonologized.

Another factor in the system is its 'goal' of achieving with as few features as possible the preservation of as many oppositions or phonemes as possible. For PIE, linguists reconstructed the system $p : b : b^h$, but it was seen that a system of this kind was hardly if ever found in any of the world's existing languages: linguists did find $p : ph : b$ (or $p : ph : b : bh$). The explanation for this is that the *b*, with respect to *p*, distinguishes itself by +voice, and the b^h by +voice, +aspiration. If the system has a p^h instead of b^h, then the third term is only marked by +aspiration and that is sufficient. (Shortly afterwards it was seen that the system was different than had been thought; see Section 11.3.6.)

On the border between internal and external factors we have the language acquisition of children. It is thought by some that children never learn their own language 100% correctly. Others doubt whether this fact, even if true, could play any role of significance. It has been noticed that sound changes among children spread more quickly than they do among adults.

Among external factors there are the influences exerted by other languages and dialects. An extreme case is that whereby a substratum is involved, when a new language comes into a particular area and is influenced by a previous language which is still present in that area. A situation of this kind implies that considerable numbers of people of all ages begin to speak another language, but in so doing still use the articulatory habits of their original language. Studying this phenomenon is complicated by the fact that the substratum languages in question mostly no longer exist. For this reason, not many cases can be 'proven.' A case which does seem certain, however, is the emergence of the retroflexes (*ṭ, ṭh, ḍ, ḍh, ṇ, ṣ*) in Sanskrit, for no other IE language has them, whereas the non-IE substratum languages of India do have them. The development of these sounds can be explained from the Indian material itself, but the fact that they actually became phonemes in this case can hardly be coincidental.

It is not only, or chiefly, a question of substratum languages. There were also superstratum languages, such as the Germanic Frankish that overran Latin in France only to disappear later on (the language incorrectly became known as 'French'; the ones who really speak 'French' = Frankish are the Dutch). This situation occurs less often. When two languages live side by side they are called 'adstrates.' This situation is found everywhere, as are dialects. It should be noted that it is quite usual for people to speak a dialect or another language beside their own. When words are taken over from one language (or dialect) into another, new phonemes can come into being. For instance, Dutch does not have a voiced stop *g* in its traditional sound system; instead, it uses a voiced fricative *g*. But French loanwords such as *garage*, *garçon* and English

words such as *goal* and *gangster* are often pronounced with a voiced stop, and (since some of these words are used quite frequently) one may argue that the stop *g* has thus become part of the Dutch sound system. The mutual influence of languages which are spoken in adjacent areas can be seen from 'areal' phenomena, similar sounds, corresponding categories of form and constructions which appear over a large area in different, even unrelated languages. This is also certainly a factor of importance in the process of sound change.

To conclude, we can point to a number of different factors which contribute to or favor sound change. Insofar as purely internal factors are concerned, all languages would long ago have reached a condition of 'permanent rest' if no other factors were involved. This seems indeed to be the case: languages which are isolated, and depend for change on internal factors only, undergo little change. On the other hand, it has been noticed that languages can undergo rapid change in a relatively short period, especially in times of social and political upheaval. We may conclude that the influence of other language systems remains the single most important factor underlying sound change.

As an afterthought, it should be admitted that comparative linguistics is not able to tell us why the changes that do occur, occur at a particular place at a particular point in time, and not somewhere else or some time later.

Language change

Chapter 5

Analogy

5.1 Introduction

Together with sound change, analogy is the most important factor which causes languages to change. Analogy is change modeled on the example of other words or forms. One can distinguish proportional analogy from the non-proportional kind. We speak of proportional analogy in the situation a : b = c : x, in which x represents the new form that needs to be solved. This form of analogy = analogy in a strict sense is the one we shall look at first (Section 5.2), after which we shall turn to non-proportional analogy (Section 5.3). In Section 5.4 we shall consider a specific effect of analogy.

Let us first acknowledge that analogy and sound-change are two completely different phenomena. In fact, there are times, as we shall see, that both work in opposite directions of each other (Section 5.5).

Because analogy is change according to the model of some other form, there must of course be a model for analogy to take place. Still, a model on its own is insufficient. What is also needed is a reason, a motive to justify change according to that model. This is something we will examine in Section 5.6. And, finally, we will stop to consider whether analogy is regular (Sections 5.7 and 5.8), which parts of a language system fall under its influence and how far, indeed, that influence may make itself felt.

5.2 Proportional analogy

We saw that proportional analogy exists in the situation a : b = c : x, in which x represents the new form. In Gothic the word 'foot' is a *u*-stem (i.e. it has a *u*-suffix), while originally it was a root noun (that is to say, without any suffix like the *u*-suffix), cf. Lat. *pēs*, gen. *ped-is*, Gr. Dor. *pṓs*, *pod-ós*, Skt. *pā́t*, *pad-ás*. The explanation is that the accusative ending -*m* was vocalized after a consonant (-*m̥*) and in Germanic became *-*um*. Now, on the basis of this form, and according to the example of the *u*-stems, the nominative -*us* was formed, which can be formulated as follows:

> *sūnum* : *sūnus* = *fotum* : x, x = *fotus*

One could also say that *fot-um* was reinterpreted as *fotu-m* according to the model of *sūnu-m*. And on the basis of these two forms, all other forms of 'foot' took on the

u-suffix. In Slavic something similar occurred. There *-*om*, the accusative ending of the *o*-stems, became *-*um*. On this basis the nominative *-*os* was replaced by *-*us*. Both forms became -*ъ*, for example OCS *bogъ* 'god'. In Balto-Slavic the accusative ending *-*m̥* (after consonant) becomes *-*im*, and this is the basis for root nouns becoming *i*-stems, for example Lith. *pilìs* 'fortress' next to Skt. *pū́r* 'city', acc. *pū́r-am*. In Sanskrit the word for 'night' also got a nominative *náktam* on the basis of the accusative *nák-tam*, through analogy of the neuters which had -*am* in the nominative and accusative, as in *yugám* 'yoke'. The old nominative was *nák* < *nokʷt-s, cf. Lat. *nox*, *noct-is*, Gr. *núks*, *nukt-ós*, Goth. *nahts*. Skt. *náktam* became an *o*-stem in this way and, moreover, a neuter, while it had originally been feminine. The reason for the change was that *nák*, *nákt-am* was an unusual declension in Sanskrit.

The aorist of *kr̥-* 'to make' in Sanskrit was as follows: 1 sg. *á-kar-am*, *2* sg. *á-kar*, 3 sg. *á-kar*. The last two forms were replaced by *á-kar-as*, *á-kar-at*, according to the analogy of an aorist such as *á-voc-am*, -*as*, -*at*. The change is of course made here because 2 and 3 sg. *ákar* were unclear forms: not only was 2 sg. identical to 3 sg., but both forms had no ending, while Sanskrit otherwise has a clear ending for almost all persons.

5.3   Non-proportional analogy: Leveling

There are also examples of change according to the model of other forms whereby no proportion can be seen or obtained, or where it does not appear to be worthwhile trying to find a proportion. The declension of 'to follow' in Greek is: 1 sg. *hépomai*, 2 sg. *hépēi*, 3 sg. *hépetai* and so forth. According to regular sound change the last two forms should have been *hetēi, *hetetai, with *t* < *kʷ* before *e* (-*ēi* came from *-*esai*). The *p*, which came from *kʷ* before *o*, was, then, spread over the whole paradigm (this is 'leveling', G. 'Ausgleich'). The reason is, of course, that an interchange of *p* / *t* is a strange one. Now, it could be said that this occurred according to the analogy of, for example, *hérp-(ō)* 'crawl', which had an old PIE *p which was the same in all forms, but this does not seem to be central. The point is that the change *p* / *t* makes the forms in question seem less clear. The variant is therefore 'removed.' Something similar took place in Latin, where from *sequor*, -*eris*, -*itur* the first form should have been *secor according to sound law; cf. *secundus* 'second' < 'following'; this word stood apart from the verb, and for this reason was not replaced by *sequundus.

The Greek word for 'herder', *poimḗn*, has in other cases the stem *poimen*-, except in the dat. pl., where we find *poimé-si*. This form must have developed out of **poi-mn̥-si* (with a vocalized *n̥*), and this developed regularly into *poimasi. Here we see that *a* is replaced by *e* according to the forms with -*men*-; the *e*-vocalism is generalized. That this is correct is evident from the fact that from *phrḗn*, 'midriff, mind' the dat. pl. form *phrasí* occurs along with *phresí*.

The accusative ending -*m̥* must have produced an -*a* in Sanskrit according to sound law, as we see from *saptá* 'seven' < **septm̥*, Gr. *heptá*, Lat. *septem*. We find, however, -*am*, for example in *pád-am* 'foot' (Gr. *pód-a*). The -*m* is added on from the stems which end in vowels, -*a-m*, -*i-m*, -*u-m*. Here proportional analogy is impossible.

Many changes of this kind can be explained by the principle 'one meaning, one form', which is to say that language strives for a situation in which one meaning is represented by one form only. This is the clearest and most economical situation. Thus the accusative ends in -*m*; the root of 'to follow' is *hep-*, and so forth.

The ending of the instrumental plural in Sanskrit is -*bhis*. In Greek we find this ending in the form -*phi*, cf. Sanskrit *náu-bhis*, Gr. *naū-phi* 'with the ships.' Although in principle it is not impossible that the -*s* was removed in Greek (it should have remained according to sound law), it is much more probable that the -*s* in Sanskrit was added. That would have occurred on the basis of the nominative and accusative endings -*as* and the dative -*bhyas*. The -*s* is thus seen as characteristic of the plural. Armenian has -*bkʿ* < *-*bʰis* in the plural and used the old form -*b* < *-*bʰi* (without -*s*) for the singular (originally the singular had a completely different ending): *aram-b* 'with the man', pl. *aram-bkʿ*.

The ablaut (vowel alternation) has largely disappeared from most of the Indo-European languages. Compare the following Greek and Latin paradigms (in the order of nominative, accusative and genitive):

Gr. *pa-tḗr*   *rḗ-tōr*   *krā-tḗr*   Lat. *pa-ter*   *orā-tor*
     -*tér-a*   -*tor-a*   -*tḗr-a*   -*tr-em*   -*tōr-em*
     -*tr-ós*   -*tor-os*   -*tḗr-os*   -*tr-is*   -*tōr-is*

The first paradigm is the oldest. Here we see a long vowel (-*tēr*) in the suffix, a short vowel (-*ter-*) or no vowel at all (-*tr-*). The second paradigm derives from a parallel system with -*tōr, -tor-, -tr-*. Here we see that the forms without a vowel (-*tr-*) have been replaced by forms with a short vowel (-*tor-*). Gr. *krātḗr* only has the long vowel left (*ē* is a long *ē* with a circumflex accent). In the declension of Lat. *pater* only two forms remain, the (original) long vowel (-*tēr* becomes -*ter*, according to sound law) and the form without a vowel. In the last word above, the long vowel has taken over everywhere (with -*tōr* > -*tor*). We may posit a process of proportional analogy at work here, but what has actually happened, of course, is that the interchanges between long/short/zero have either been reduced or completely eliminated, because they were superfluous, for the endings were already clear enough without them. It proved to be simpler and clearer to have only one form of the suffix.

By means of 'analogy' suffixes can become increasingly longer. The PIE suffix *-*no-*, Lat. -*nus*, is used for the formation of adjectives, for example *domi-nus* 'master' (< '(he) of the house'). This same suffix followed a root ending in -*ā* in *silvā-nus* 'of the woods', for example. From this derives the complex -*ānus* which is used in *urb-ānus* 'of

the city' and *hūm-ānus* 'human'. One could say that *silvānus* has been analyzed incorrectly. From forms such as **aies-no-s* > Lat. *aēnus* 'of bronze' the suffix *-ēnus* has been 'distilled', e.g. *ali-ēnus* 'of another.' In the same way *-iānus* (*christiānus*) developed, *-inus* (from *dominus*), *-tinus* and *-īnus* (*vīc-īnus* 'in the vicinity'). The analogy is here not more than an element being taken from another word, even when this is historically impossible: *-ānus* is, historically speaking, the product of an incorrect analysis.

5.4   Replacement, secondary function and split

In the examples we have looked at so far, one form has simply replaced another: **hétetai* was replaced by *hépetai*; **rḗ-tr-os* was replaced by *rḗ-tor-os*, and so forth.

But there are other examples where the old form is preserved without replacement taking place. A clear example of this is the nominative plural case of the *o*-stems in Old Irish. The original ending was **-ōs*, but this was replaced by the ending **-oi*, taken over from the pronouns (as in Greek *-oi* and Latin *-ī* < **-oi*). The form based on *-ōs* continued to be used for the vocative, for the nominative case had also served as the vocative, e.g. nom. pl. *fir* 'men' < **wir-oi*, voc. pl. *firu* < **wir-ōs*. The old form here continued to be used but in a less important aspect of its original function. The remarkable thing about this development is that it is the only case among the IE languages where a separate form came into being for the vocative plural.

An example of 'split' can be seen in Lat. *deus*, 'god'. This word derives from PIE **deiu̯os* (Osc. *deívai*, Skt. *devá-*). The operation of sound law resulted in *deus* (*ei > ē*; *u̯* > Ø/_*o*; *ē > e* before vowel), but the genitive form **deiu̯ī* became *dīvī* (*ei > ē > ī*). What then happened is that *deus* developed a complete declension of its own (gen. *deī*, and so forth) as did *dīvī* (nom. *dīvus* and so forth). Finally, *dīvus* was displaced by *deus*, and only continued to be used to refer to the deified emperor as *dīvus Augustus*. Both forms were given complete paradigms, but one of the two almost completely disappeared, save in a specific function.

5.5   Analogy and sound law

A sound law may make a regular system of declension irregular, as we have seen: Lat. *genus*, gen. *gener-is* with stems in *-s* and *-r*; Gr. *ménos*, gen. *méne-os* with stems in *-s* and *-Ø* derived from what were originally s-stems. Analogy, by contrast, builds systems by definition; it alters strange or infrequently found systems according to the model of clear or more commonly found systems, and it simplifies systems (Ausgleich). It is for this reason that analogy often rebuilds that which a sound law has destroyed.

We have already seen that the *s*-aorist Gr. *é-lū-s-a* has a restored *-s-*, because *s* between vowels disappeared. Here two possible explanations present themselves: the *s* indeed disappeared (for a time, at least, from the whole area in which the language was spoken), and later was restored, or it was reintroduced directly. Some say that analogy prohibits the operation of the sound law. However, this way of putting things may give a wrong impression: analogy is not a force that obstructs another force before it has accomplished anything. It is only capable of reestablishing a situation once it has been changed. What can happen is that analogy begins to work as soon as the *s* disappears from the speech of just a few people. The only correct thing to say is that the sound laws *always* work, while analogy has the power to *restore.*

It is often difficult to decide what, exactly, the conditions are within which the sound laws have been operative, and what must be explained as due to analogy.

5.6   Model and motive

It is obvious that analogy needs to have a model, because by definition it always works according to a model. The model cannot be seen, its existence is one which we assume. A model has to be 'good', it has to 'work.' In many cases it is evident that the (operative) model is 'good.' When a nominative in *-us* is formed on the basis of an accusative in *-um*, after the model of the *u*-stems that have nom. *-us*, acc. *-um*, the adequacy of the model is evident. But not infrequently scholars cannot agree on the adequacy of the model in question. We must remember that both analogy and model are theoretical constructs and are thus never simple facts. The examples just given have been presented as if they were facts, but they are really only theoretical constructs about which there is fairly wide agreement.

An example: in Latin the root vowel is lengthened in the passive perfect participle when the preceding consonant was a voiced (non-aspirated) stop, e.g. *lego* : *lēctus* 'to read' : '(having been) read' (**Lachmann's law**). One explanation for this would proceed as follows:

pres. act. :   pres. pass.   = pf. act. : pf. pass.
legit   *legitur*   = *lēgit*   x   ,   x = *lēctus* (*sum*)

This explanation is fraught with a number of factual problems: with *agit*, *agitur*, *ēgit* 'to lead' one would expect to see **ēctus*, but instead it is *āctus*; it is not clear why this mechanism only affects stops which originally were voiced: why not *facit*, *facitur*, *fēci*, **fēctus* (it is *factus*)? More important is that in my view this model will not work. The proposition should give us **lēgitur*, not *lēctus*. The passive perfect in Latin is periphrastic — described with the aid of a participle and the verb 'to be', *āctus est* 'he is led' — and it is improbable that the participle, which was also widely used outside

this construction, changed according to the model of the non-participial forms of the active perfect (*ēgit* 'he has led'), with which it has nothing in common insofar as form is concerned. I give this example because scholarly opinion is divided on it. Some see it as an example of a neat explanation and it is presented as such in an introduction to comparative linguistics (Lehmann, *Intr.* 199). For a possible solution see Section 11.3.6.

Apart from a model an analogical change must also have a motive. To put it another way, a change does not occur because it can occur, but because there is a reason for it to occur. In general a reduction of the number of types, which amounts to a simplification of the system, is already a motive. If the accusative in *-*a* < *-*m̥* in Sanskrit is replaced by -*am*, a reduction of the number of accusative endings is achieved. In Greek the accusative in -*a* (*pód-a*) was preserved, probably because there are few accusatives in -*an* in that language (only from words in *-*i̯a*). When in Germanic a nominative ending with -*us* is formed according to the model of the accusative ending in -*um*, the -*s*, -*um* type disappears. The total number of types is thereby reduced.

5.7   The regularity of analogy: Direction

It is not always easy to see the direction in which analogy is working. Of the Balto-Slavic *o*-stem nominative and accusative endings *-*os*, *-*om*, the latter became -*um* (> Slav. -*ъ*). This form was the basis for the Slavic nominative ending -*ъ*, as we have seen. In Baltic, however, the development went in the opposite direction: the accusative was altered on the model of the nominative. Can analogy, then, arbitrarily chose any direction in which to work? No. It would seem better to assume that there is no such thing in the field of linguistics as a development which is truly arbitrary. There is always a reason why things happen the way they do, although it is not always easy to see what that reason is. In Baltic *-*os* became > -*as*, and this was the basis upon which an accusative was formed (*-*am* > Lith. -*ą*). In general it is not obvious that forms of *u*-stems (-*us*, -*um*) should be introduced into *o*-stems. The Baltic development would thus seem to be the usual one. The nominative in Slavic was probably replaced because when *-*os* became -*o*, the neuter *s*-stems had -*o* < *-*os* (OCS *nebo* < *nebʰos), as well as the neuter *o*-stems (with -*o* < *-*od*).

We have already seen that either the short or the long vowel was generalized in Greek words ending in -*tēr*, -*tōr* (Section 5.3). But Gr. *anḗr* 'man' gave Attic *ándra*, *andrós*, that is to say, the old accusative *anéra* was replaced by *ándra* on the model of the genitive *andrós* < *anr-os; here, then, the form without the vowel is extended. It is difficult to say why this happened. Perhaps it was because the stem-form *andr-*, with epenthetic *d*, was so characteristic. Perhaps it was because forms such as *anéros*, with three short syllables, were avoided. Latin extended the stem *patr-* for 'father'. This may

have been due to the fact that a short syllable in Latin was often syncopated, so that Latin developed by the operation of a sound law a very great number of forms which contained no vowel in the suffix.

Another complicated case is the following: The 1st, 2nd and 3rd sg. endings of the middle in classical Greek are *-mai*, *-sai*, *-tai*. Earlier they had been *(-*m*)-h_2 (h_2 = ſ), *-*so*, *-*to*, which gave Greek *-*mah*$_2$, *-*so*, and *-*to*. The -*i* was (analogically) added on in order to characterize them as (primary) present-tense endings, whereby *-*mai* (< *-*mah*$_2$*i*), *-*soi*, and *-*toi* evolved. After this the *a*-vocalism was generalized. That things happened in this particular way, and not the other way around (that is, in the direction *-*moi*, *-*soi*, *-*toi*) is not at all self-evident. In the first place, two of the three forms had an *o*. In the second place the 3rd person is the most influential. Reputable scholars have, then, rejected this explanation, but it must have happened in the way just described. The explanation is confirmed by the secondary endings (those of the past tense) where Greek had -*mān* < *-*mah*$_2$*m* (> Ion. Att. -*mēn*), -*so*, -*to*, with *a* in the 1 sg. and *o* in the other persons. In passing we may ask why, in this second series, the *a* has not extended itself. Probably this was because -*mān* and -*so*, -*to* had too little in common insofar as the form is concerned, as opposed to -*mai*, -*soi*, -*toi*.

Although it cannot be proven, it seems reasonable to assume that every single linguistic change has a reason which can explain it. Of course it is possible that in certain instances the opposing forces held each other in a more or less balanced situation, so that both developments were equally possible.

5.8   The regularity of analogy: Change or no change

Another question is when analogy does or does not become operative. That the *s* was not restored in *méne-os* < *-*menes-os*, while it was restored in *élūsa*, is easy: in the last case there are forms in which the *s* was preserved by a sound law (*-*edeiksa*), which was not the case in the first example, for the suffix had the form -*es* so that the *s* always occurred following a vowel: there was, then, no model. In 2 sg. med. *elū́sō* < *-*elū-sa-so* the first *s* was restored and the second was not restored: this second *s* always occurred after the vowel in -*saso*. The *s* of -*so* was restored in the pluperfect *elélūso*, for here -*so* was found after a consonant with other verbs. If there is no model, no analogy is possible.

The problem is that analogy sometimes seems to be operative and sometimes non-operative in the same circumstances. In the Greek words ending in -*tēr*, -*tōr* we saw that *patḗr* had preserved the old forms, while elsewhere they were simplified by the operation of analogy. Here the explanation is a simple one: the kinship terms ('mother', 'brother') behave as the word *patḗr* does. These words comprised a small, homogeneous group which moreover occurred very frequently. This last factor

provides the solution: words which occur very frequently are more resistant to the workings of analogy. They apparently are so firmly anchored in the memory that they are not easy to replace. Thus, in the Greek verb for 'know' 1 sg. *oĩda* 'I know', 1 pl. *ídmen* 'we know', the old interchange *oi/i* (cf. Goth. *wait*, *witum*, Skt. *véda*, *vidmá*) is preserved, while elsewhere this ablaut disappeared in almost every instance. The verb 'to know' is of course a very common one. It is only in the New Testament that the 1 pl. *oídamen* makes its appearance, which is formed according to the normal type. The most stubborn ablaut in Indo-European is that in G. (*er*) *ist*, (*sie*) *sind*, where the root is, respectively, *is-* and *s-*. In PIE it was $*h_1és\text{-}ti$, $*h_1s\text{-}énti$ (see Section 2.2).

The question of whether analogy always became operative when both a model and motive were present in the absence of hindering factors (such as the frequency-of-use problem discussed above) probably cannot be answered. One problem is that the relevant factors can hardly be 'weighed' against each other.

5.9   The limits of analogy

In the cases which we have examined, analogy has been operative in the endings and suffixes of words (the development toward *u*-stems; the suffix Lat.-(*ā*)*nus*). This is because in inflected languages endings and suffixes, which are sometimes intertwined, show clear patterns which can function as models for analogy. This is not the case with the beginnings of words (that is to say, the roots). There we see no clear form-models. Should analogy try to exert its pressure in the root-part of different words, there would have to be some kind of relation in their meanings. But relations are seldom found which are clear enough in the beginnings of words as to make the operation of analogy possible.

There is such a relation in numerals, which explains why analogy can become operative among them, e.g. OCS *devętъ* 'nine' with *d-* instead of *n-* (cf. Latin *novem*, Skt. *náva*, E. *nine*) taken from *desętъ* 'ten.' In Tocharian (dialect B) the word for 'mother', *mācer*, has the *ā* of *pācer* 'father' (< $*ph_2tēr$). According to sound law $*mocer$ would be expected from $*meh_2tēr$ for 'mother'; compare *procer* 'brother' < $*b^hreh_2tēr$.

Chapter 6

Other Form-Changes

6.1   Additions

The sound-form of a word or form can also change in a different way than by the usual process of sound change (Chapter 4) or analogy (Chapter 5). This often is achieved by additions.

The locative in Lithuanian had a postposition *en (cf. Gr. *en* 'in'), which became a fixed part of the form: *žiemojè* 'in winter'.

The 1 sg. subjunctive in Sanskrit ended in -*ā* or -*āni*, e.g. *áy-ā*(*ni*) 'I should go'. The old form is that which ended with -*ā* (< *-*ō*; cf. Gr. pres. *leípō*). The element -*ni* is apparently an added particle. Its origin is not known, something which is often true of particles.

The 3 sg. in Old Prussian sometimes has -*ts*. Cf. *imma* vs. *ymmits* in *imma tans stan geitin* versus *ymmits stan geittin* 'Took-he the bread'. This -*ts* is the pronoun *tas*, 'he'. Perhaps we could still call this an enclitic pronoun. In Slavic the 3rd sg. ending is -*tъ*, which has a similar origin and became the normal ending.

We find attached particles of this kind especially in the case of pronouns. Gr. *hóde* 'this' is *ho* + the particle *de*. Gr. *hoûtos* 'the one (who is with you)' is *ho+u+to-*. Gr. *ekeînos* 'there' also probably consists of three elements: PIE *h_1e*, *$\hat{k}e$*(*i*) and a third whose origin is disputed.

6.2   Adopted forms

In some cases forms belonging to a category which has disappeared are taken over for use by another category. The ending of the 1 pl. -*u̯eni* in Hittite is (perhaps) originally the dual ending. Hittite lost its dual, and this form seems to have displaced the plural ending.

The imperative in Slavic is characterized by -*ě*- < *-*oi*-, and that is the characteristic of the old (thematic) optative; e.g. *bǫděte* 'you must be'. Slavic no longer has a separate optative.

The subjunctive of 'be' in Old Latin was *siem, siēs, siēt, sīmus, sītis, sient*. These are the old (athematic) optative forms. The old subjunctive of 'be' became the future tense (*erō*).

6.3   The creation of new formations

Sometimes completely new forms evolve. Whether we should still speak of 'change' here is hardly an interesting question. We shall discuss this phenomenon in brief.

The so-called periphrastic (descriptive) forms should be mentioned in this context. These are forms which consist of a participle and forms of an auxiliary such as 'are', 'have', 'shall', 'do'. For the 3 pl. of the medio-passive perfect Attic has *me-mig-mé-noi eisí* 'they have mixed with one another' or 'they are mixed'. The forms of the other persons are not periphrastic, and the 3 pl., formerly, was not periphrastic either. The Latin passive perfect is completely periphrastic: *laudātus sum*, *es*, *est*, 'I am, you are, he is praised' and so forth. These forms are not the products of changes which have occurred to earlier forms.

The imperfect of several IE languages has been completely recast. For the past tense of the weak verb Germanic has the type of Goth. *nasi-da*, *-des*, *-da*, *-dedum*, *-deduþ*, *-dedun* 'I etc. saved'. The forms consist of the root of the verb (*nasjan* 'to save') and a form (reduplicated in the plural) of the root $*d^h\bar{e}$- (PIE $*d^heh_1$-), cf. Gr. *tí-thē-mi* 'to put', E. *do*. — The Latin imperfect of the type *laudā-bam* must be an Italic creation. The *-b-* originates without doubt from the root $*b^h\bar{u}$- 'be', Lat. pf. *fuī*. — The Slavic imperfect was characterized by an element *-ax-*, e.g. *viděaxъ* 'I saw'. This derives from *-ōs-*, which probably is the old perfect of 'be', e.g. Skt. *ā́sa* 'I have been' < $*\bar{o}s\text{-}a$ (< $*h_1e\text{-}h_1os\text{-}h_2e$, cf. Gr. *lé-loip-a*).

Chapter 7

Vocabulary Changes

7.1 Introduction

So far we have only paid attention to changes in the form of words which had no effect on their meaning; or, if there were changes of meaning, we have until now ignored them. In the next two chapters we shall be making such changes the central theme of our inquiry, although we shall still be referring to changes of form in passing.

We shall begin by examining changes which occur in the vocabulary or 'lexicon' of a language. When we leave the complete disappearance of old words and the coming into existence of new words out of consideration, what we are left with is changes of meaning which can occur to the vocabulary of a language. 'Meaning' is very difficult to describe, but this is not to say that it is therefore 'vague,' as has often been argued. I happen to agree with those who maintain that words have meanings which are quite sharply defined. An indication of this is that each speaker in his or her own language can immediately tell when a word is being used appropriately, whether another word would do just as well or better, whether the two really mean (or do not mean) the same thing — even though that same speaker may not easily be able to explain why one word cannot be used in a particular context while another can, or what the differences in meaning may be between either of those words and some other word.

The adequate description of changes in meaning and the ascertaining of the reasons underlying them are exceptionally ungrateful subjects for the comparative linguist; we may freely admit that no one has as yet come up with a really satisfying method for dealing with the subject. The reason which is traditionally offered for this, is that the number of meanings is far greater than the number of words. Words are given the job of representing reality in all of its infinite variety. In addition, they must also represent and communicate the way we see reality and react to it. In order to accomplish this daunting task, in order to cope with a constantly changing world and a constantly changing perception of that world, we employ a vocabulary of only a few thousand words. The number of words which speakers have at their command may range from about 2500 to some tens of thousands. The language of a complex culture (such as the English language), which needs to have words representing a very large number of things and abstractions, contains perhaps 100,000 words, among which very great numbers of highly specific, technical words, which can range from the 'quark' to the 'combine harvester'. When the need arises we help ourselves with

compounds or by replacing old meanings by new ones while the words stay the same. The number of compounds is enormous: common examples are 'mailbox' and 'shoe-lace'. News reports of the Vietnam War popularized the combined word, 'bodycount', as a new euphemism for the death toll after battle — the list can be extended endlessly.

Because words are required to represent all of reality, or, better, all that we think and feel about reality, they change in every possible manner, and this is the reason why developing a useful, systematic way for categorizing and organizing these changes is, in fact, quite infeasible. It is often said that each word has its own private history. This is true, and it is very understandable, so we will not attempt here to provide a history of all possible changes. In comparative linguistics, which studies changes in the meanings of words before they were ever written down, we must often be satisfied with general 'hunches' which can be tested against later developments which are known to have occurred in historical times for which we have written documents. Naturally, some general tendencies can be noticed and described, and these we shall discuss.

When dealing with changes in the meaning of words it is often the case that questions of how and why become intertwined with each other. That is understandable, since sometimes the change itself and sometimes its causes are clear and easy to describe, and scholars working in this endless field of endeavor are happy to be able to name whatever lends itself to description. But in the following sections we shall try to bear in mind the distinction between these two very different questions.

7.2   The disappearance of old words and the appearance of new ones

In this section and the two following sections (7.2 to 7.4) we shall be describing *how* the lexicon of a language changes, that is to say, we shall be looking at those things which we can more or less see happening. Afterwards (Sections 7.5 and 7.6) we shall deal with the question of *why* these changes seem to have occurred.

Old words disappear and new ones keep on turning up. This is probably the easiest aspect of the whole subject, and that is why we shall begin with it.

The disappearance of words. Words can disappear when the thing (or abstraction) which they refer to (the referent) disappears. So the English word 'stomacher' once referred to a kind of women's front wear, but the word is now long obsolete, presumably because the kind of dress the word referred to went out of fashion. The referent disappeared, taking the word 'stomacher' with it.

In other cases the reason(s) for disappearance are less clear. Thus the Indo-European languages have very different words for 'head': Skt. *mūrdhán-*, Lith. *galvà*, OCS *glava*, Gr. *kephalḗ*, Lat. *caput*. These must have all taken the place of some other word, probably the one that is still found in Skt. *śíras-*, Gr. *kárē* (PIE *$kr(e)h_2$). Neither do we

find many related words in the Indo-European languages for 'hand': OE *folm*, Goth. *handus*, Skt. *hásta-*, Gr. *kheír*, Lat. *manus*, Lith. *rankà*. The old word surely continues to be found in Gr. *kheír* (PIE *$\hat{g}^h es$-r*) but in the languages named above it has disappeared (Skt. *hásta-* is derived from the same root, *$\hat{g}^h es$-to-*). Perhaps in such cases a taboo of some kind has been at work (see Section 7.6).

The appearance of new words. New words are not in the habit of appearing out of nowhere. We are not referring here to new words which are derived, with the addition of a suffix, from old ones (such as 'stewardess', which is obviously derived from 'steward'), or compounds such as 'mailbox', but words whose roots had no previous existence in a language. An 'artificial' word is the word *gas*, but that is a kind of loanword, coming as it does from Gr. *kháos*, which was used to mean 'air'. Completely new things sometimes are given the names of their inventors, such as the word *volt*, which is named after the Italian scientist, Volta. The *sandwich* is named after Lord Sandwich, who ordered it to save time for playing cards. It is sometimes necessary to have knowledge of the most curious facts in order to understand a particular word. The English word *sabotage*, for instance, comes from the Fr. *sabot*, meaning 'wooden shoe', which discontented weavers threw into the machinery of the factories where they were working, bringing all production to a halt. The *jerrycan*, a large metal can used for storing or transporting gasoline, is named after the English slang word for the Germans during the Second World War, *Jerries*, because the German cans were better than the English ones. Sometimes the origin of a word is unclear or disputed: thus the Dutch word for 'bicycle', *fiets*, is unexplained, even though the word has only been in use from 1870 onwards. Of course, many new words are borrowed. *Admiral*, for example, is a loanword from Arabic. That new words accompany new things is clear from the fairly recent addition of the word *kiwi* to every English-speaking person's vocabulary; it comes from Maori.

Another way in which new words can come into existence is by means of the elimination of a word within a group of words, a process which is called 'ellipsis'. Eng. *private* in its military sense of a low-ranking soldier was originally 'private soldier'. What had been an adjective thus became a noun and acquired the whole meaning of the original. Thus *general* was shortened from French *capitaine général*, meaning 'overall commander'. *Funeral undertaker* became *undertaker*, perhaps because of the taboo associated with *funeral* (see further below). Fr. *rien*, 'nothing', comes from Lat. *rēs* (acc. *rem*.) 'thing', as a shortened form of *ne … rien*; that is to say, it began as 'something' and came to mean 'nothing'! The abbreviation of single words also leads to new words: E. *plane* comes from *airplane*, E. *auto* from *automobile*, while in Swedish *automobile* was shorted into *bil*. A similar case is the word *bus*, which was originally Lat. *omnibus*, literally 'the vehicle for everyone': *-bus* in Latin is the plural ending of the dative case!

Sometimes new words appear as substitutes for other words which have become taboo. Thus Russian *medved'* (literally, 'honey-eater') has taken the place of 'bear' (see further Section 7.6).

As indicated above, most new words are compounds made of two or more older words. We will not go further into the subject of compounds, with the exception of certain special cases which deserve our attention (*medved'* originally was also a compound).

Many new words nowadays are scholarly compounds which have been made to describe things of a technical nature. Most of these make use of Greek or Latin elements, such as *cardiogram* from Gr. *kardía* 'heart' and *grámma*, 'line, piece of writing'.

A translation of a foreign word ('*Lehnübersetzung*') is the German word *Fernsehen* for television. The modern Greeks translated *automobile* ('moving of its own accord') into modern Greek as *aftokínito < autokinétos*. A purist substitution is the Flemish *wentelwiek* ('with rotating vanes') for *helicopter.*

A compound sometimes comes into existence by means of an addition that makes things clearer: Du. *walvis* (*vis*, E. 'fish') for *wal* (cf. E. 'whale') is an example (note that it is <u>not</u> a fish).

If a compound word eventually becomes indivisible, a new word appears which is not visibly connected with its origins anymore. Thus G *Elend* ('misery') derives from OHG *elilenti* 'sojourn in a foreign land, exile' (Goth. *alja-* 'other' and *land*).

Substantives may, in a case-form, develop into pre- or post-positions. Lat. *causā* 'for the sake of' is the ablative *causā* 'due to the cause'. Gr. *antí* 'against' is the locative of the noun which is still found in Hitt. *hant-* 'face'.

7.3   Changes of meaning: Reduction or expansion of features

In this section and the next we shall be examining the phenomenon of change in meaning. Meaning can be described as a combination of features, a definition which allows us to describe meaning change as the loss or acquisition of such features. Cases which cannot adequately be described in this way will be discussed in the next section (7.4).

When a word like *foot* is used in a sense other than 'human foot', as in *at the foot of the mountain*, it is possible to say that the word has lost the feature +human. Because it has one feature less, it is also more widely applicable. Lat. *pecūnia*, originally 'value in the form of cattle', simply became 'currency' of any kind. It lost one feature and its usage thus became less restricted. The word *climate* in one of its meanings has lost its restricted application to weather. 'Wall Street Climate Depressed and Chilly' was the headline in the financial section of a newspaper. G. *fertig* originally was limited in meaning to 'ready for travel' (to G *Fahrt* 'ride, journey'), but now means 'ready' in the

broadest possible sense. Fr. *équipe*, *équipage* originally was restricted in application to ships and shipping (*équipe* < *skip).

When features are added, a meaning becomes more precise and more narrow, resulting in greater restriction in usage. Eng. *deer* originally meant any 'animal', as G. *Tier* still does, whereas now it is limited in English to four-legged mammals of the Bambi-variety. Similarly, *hound*, which once meant any dog, is now limited to hunting dogs. Lat. *pōtiō* (acc. *pōtiōnem*) 'a drink' became Fr. *poison* 'poisonous (drink)'. Lat. *lapis* (acc. *lapidem*) 'stone' was restricted to 'gravestone' in the It. word *lapide*, which comes from it. The Dutch word *gang* (cf. G. *Gang*) was originally used for any path, narrow walkway, etc., but later became restricted in meaning to the covered passage in a house. The direction which the meaning will take of course depends on the original meaning of the word in question, but can still produce some surprising results, as in the case of Lat. *pōtiō*.

7.4   Changes of meaning: Other cases

Most changes, however, cannot so easily be accounted for.

In some cases the change is one of both expansion and reduction of features. When the word *house* began to be used for 'family', as in the 'house of Tudor', we can say that the material feature has been lost and a human feature has been added. Perhaps, though, it is more essential that this meaning was originally metonymical, the house coming to represent the family which resides in it. Note that, in this case, it also maintains its original, material sense. To be 'back in the saddle again', once the parlance of cowboys only, has expanded to mean being 'back in charge of something again', 'returned to a dominant position', yet the original feeling of wild liberty still inheres in the phrase no matter what its present application.

Metonymy is an interesting form of language change. We use the word *crown* for the person who wears the crown, the king. Thus: 'crown' > 'he or she who wears the crown'. Lat. *lingua*, originally 'tongue', later expanded to mean 'language', a development which is found in many languages. 'Language' was clearly seen as something 'which the tongue brings forth'. It doesn't make much sense here to speak of expansion, though, since we do not wind up with a less limited use of the word 'tongue'. Similar is the use of the word 'sun' to mean 'day', that is, the period during which the sun is shining.

Often we find a development from the abstract toward the concrete. E. *youth* at one time only meant that period of life in which one is not yet adult, but later it came to mean a 'young man.' Sometimes we find an action which moves in the direction of a concrete object, as in the aforementioned Dutch word *gang*, which meant 'going' but eventually also came to mean a passageway in which you are 'going' (cf. E. *gangway*).

There are many cases in which the change involved is very difficult to follow. The word *thank* is related to the word *to think*, which must lie at its origins, but how did the one change into the other? Roughly, perhaps, as follows: 'thought' > 'insight' > 'recognition' > 'sense of obligation' > 'thanks'.

The word *dilettante* originally had no negative connotations. To the contrary, it meant something like 'devoted amateur, someone whose interest is based on a love of the subject' and that was appreciated, and it could take place on a high level, indeed. But when it began to be seen in opposition to 'professional or expert', the value of *dilettante* decreased to a level meaning 'a hobbyist who can never reach the level of a true professional', etc. The word *amateur* displays exactly the same kind of development. It can have just such a negative meaning, though usually it does not (yet) always have it. Scholars have regarded such developments toward a negative, pejorative meaning as a separate category, but I believe that the negative connotation is only accidental in nature, a consequence, and thus not deserving of a special category of its own.

Latin had a word for 'human', for 'man', and for 'woman', respectively *homō*, *vir*, *fēmina*. In French the word for 'man' has disappeared, and *homme* means both 'human' and 'man'. We see here that in a particular field of meaning Latin had three words, while French has two, with a different 'division of labor.' We often say that a word with its meaning has a common boundary with the boundary of another word's meaning, and that change in one case must therefore lead to a shift in the whole field of meanings. Nevertheless, the study of such 'fields of meaning' has not produced anything really new.

7.5   Causes: Wörter und Sachen

In Section 7.2 we have already looked at the causes which underlie the disappearance of old words and the rise of new words. Here we shall examine the problem of change as it affects existing words.

One cause for change is easy to identify: when referents in the real word undergo change, it is quite probable that the words which describe them will undergo changes of meaning (though the word can sometimes disappear altogether as well, as we have seen). A well-known example is the word *pen*. It comes from Lat. *penna* meaning 'feather, quill'. When people began using quills as writing instruments, the meaning of the word changed to describe the instrument in question, and *pen* continued to exist long after quills of any kind went out of fashion and totally different implements took their place.

7.6   Other causes

Taboo is also a reason underlying changes of meaning, but only in the sense that a name (in its form) undergoes change or another word supplants it. The best-known example of a taboo is that the Jews do not pronounce the name of their deity, but instead use a word meaning *Lord*. This was a taboo that had far-reaching consequences, because many Christians may have found it easier to accept as their Lord one of the local gods of Palestine, who was really called Jahweh. We have already mentioned Russ. *medved'* used for 'bear' (Section 7.2), which caused the language to drop the original word.

In Greek the Erinyes or goddesses of revenge were called the *Eumenides*, 'those who are favorably disposed', which is exactly what they were not. The Black Sea, which is often dangerous, was called by the Greeks *Póntos Eúkseinos*, the 'hospitable sea', while at first its name had been *Akseinos*, 'the inhospitable'. It is possible that *Akseinos* is a bastardization of a Persian word for 'blue'. Whatever the explanation, *Akseinos* was found to be unacceptable.

Euphemism, which is closely related to taboo, is another reason for change, but here too it usually involves the complete substitution of one word for another. A recent example is 'slow learner', which was thought up to replace 'mentally handicapped', which in its own turn was used as a euphemism for 'retarded', which was once thought be kinder than 'feeble-minded', etc. Illnesses are sometimes not actually named by their proper names. This is especially the case with 'cancer', though the taboo did not result in its displacement by another word. Death is a favorite subject for euphemism. 'If something happens to me' means 'if I should die', which is a phrase many people do not like to say or hear uttered. 'To pass on', 'to pass away' or to say that 'so and so is not with us any more' or 'has gone to a better place' are all euphemisms for dying. In Homer it is *nēleès ēmar* 'the unavoidable day', which is a euphemism for death.

Sometimes a kind of saturation-effect is responsible for changes in a word's meaning. In such cases other words are used in place of the 'saturated' word, though they sometimes acquire a different meaning. The most sensitive words to this kind of change are words expressive of enthusiasm ('great', 'terrific', 'fantastic', 'way out', 'too cool', 'outer space', etc.), which are always subject to rapid changes of fashion. In other cases words lose their original meanings. Titles of address such as G. *Herr*, Fr. *dame* from Lat. *domina* are examples of words which have lost their original meanings.

A concept such as metaphor (figurative expression) tells us not only how but also why a particular change of meaning has occurred. The word *climate* mentioned above is a case in point. The 'figurative' extension of the word's literal meaning may not be the *cause* but it does tell us everything there is to say about the cause. A *leaf* of a book is a figurative extension of the word's literal meaning, and the cause of the extended sense.

The same applies both to metonymy and 'pars pro toto' ('a part representing the whole'). The phrase 'I'd like a glass, thank you' stands for the contents of the glass and not the glass itself. Here, too, we can say nothing about the underlying cause. It is an abbreviated usage, with perhaps an element of euphemism in it.

Finally, we should take note of the fact that the development from concrete notion toward abstract is a very common one. The best known example of this development is Lat. *anima* for 'soul', but originally 'breath' (cf. Skt. *áni-ti* 'he breathes').

We must allow ourselves to be satisfied with these brief remarks. As we have seen, it is frequently the case that nothing at all can be said about the causes of a change in meaning in words.

Chapter 8

Morphological and Syntactic Change

8.1 Introduction

As we have already indicated (Section 7.1), we assume that not only words, but also forms (morphology) and groups of words (syntax) have meaning. In Chapters 4, 5 and 6 we looked at changes of form which had no effect on meaning, or we neglected the subject altogether. Now it is precisely this subject which is at the center of our attention. Morphology and syntax are dealt with in one and the same chapter because morphological change often leads to syntactic change, and vice versa.

8.2 Morphological change

8.2.1 The disappearance of morphological categories

PIE had a relatively complex morphological structure. The most commonly found change is therefore the disappearance of morphological categories. In this process, similar categories often merged with each other.

PIE had eight cases, which still exist in Sanskrit. These are, in addition to the nominative, genitive, dative and accusative, the ablative (which indicates origin), the locative (indicative of place), the instrumental case (by which means something happens) and the vocative (with respect to the addressee). Greek has only five of these cases left, having lost, among others, the instrumental case. Sanskrit, for example, used the instrumental in: *devó devébhir ā́ gamat* 'may the god come with the other gods' (*devé-bhir*) (Rigveda 1.1.5) and *áhan vṛtrám índro vájreṇa* 'Indra killed Vrtra with his lightening bolt' (*vájreṇa*) (Rigveda 1.32.5). Greek used the dative here, usually with a preposition: *oíkad' iòn sùn nēusí te sēis kaì soîs hetároisi Murmidónessin ánasse* 'Go home with (*sùn*) your ships and your men and be king of the Myrmidons'. We see, then, that the dative here has taken over the function of the instrumental case, and that a preposition is used. Whenever the use of the preposition becomes fixed, a single form (in the instrumental case) has been replaced by a syntactic construction. The same sentence shows us an example of a dative (*Murmidónessin*) in the sense of 'at, in the midst of', where PIE and Sanskrit would have used the locative. The

instrumental and the locative have merged with the dative in Greek. We find this kind of development taking place quite often.

PIE had, next to the imperfect (incompleted past tense) and the perfect tense (completed present tense) an aorist. In Greek this still exists, in Latin the aorist has disappeared because it merged with the perfect. That the aorist and the perfect merged can be seen in the forms: *vīdī* 'I have seen' < **uoid-h$_2$e-i* is an old perfect, cf. Gr. *oīd-a*; *dīxī* 'I have said', however, is an old aorist, cf. Gr. *é-deik-s-a* (the *-s-* is the characteristic of the aorist).

We already saw (Section 6.2) that the old subjunctive of 'to be' Lat. *er-ō* became the future ('I shall be'), and that the old optative (1 sg. *siem*, later *sim*) became a subjunctive (and no optative remained). Disappearance and mergers or shifts of one kind or another often have consequences for the language system as a whole.

The three genders of PIE — masculine, feminine and neuter — are not always preserved. In Lithuanian the neuter gender has disappeared (as in French). German preserves all three PIE genders, in Dutch the masculine and the feminine have merged (into what one might call a *genus commune*), whereas in English the gender distinction has been lost altogether.

8.2.2   The rise of new categories

New categories can also come into being — otherwise not many would be left.

Four new cases arose in Lithuanian by the addition of a particle to an already existing form: an illative ('up to, at') = accusative + *n(a)*; an allative ('towards') = genitive +*p(i)*; an adessive ('at') = locative + *b(i)*; and an inessive ('in') = locative + *en*. That these were full-fledged cases can be seen from the fact that adjectives also received this form; for example OLith. *namuosna tavuosna* '(up to) in your house' (*-uos* acc. pl. ending; *tāvas* 'your'); *pagirtosp mergosp Mariosp* 'to the praised virgin Maria' (*-os* gen. sg.; *mergà* 'maiden'). The forms probably came into being under the influence of Finno-Ugric. Nowadays they have largely disappeared, with the exception of the inessive, which has taken the place of the old locative.

In Tocharian we find a total reorganization of the system of case-endings. In PIE each case had its own ending, with completely different forms for the singular and the plural (for example, dat. sg. *-ei*, dat. pl. *-mus*). Tocharian, however, had a nominative, an 'oblique' case or obliquus (congruent, in part, with the accusative) and a genitive case, and furthermore a number of 'endings' which were the same for both singular and plural, which were added after the obliquus (sg. and pl.). For example, Tocharian A *kāṣṣi* 'teacher':

		sg.		pl.	
nominative			*käṣṣi*		*käṣṣiñ*
obliquus			*käṣṣiṃ*		*käṣṣis*
genitive			*käṣṣiyāp*		*käṣṣiśśi*
instrumental	*-yo*		*käṣṣinyo*		*käṣṣisyo*
perlative	*-ā*		*käṣṣinā*		*käṣṣisā*
comitative	*-aṣṣäl*		*käṣṣinaśśäl*		*käṣṣisaśśäl*
allative	*-ac*		*käṣṣinac*		*käṣṣisac*
ablative	*-äṣ*		*käṣṣinäṣ*		*käṣṣisäṣ*
locative	*-aṃ*		*käṣṣinaṃ*		*käṣṣinaṃ*

The 'cases plus endings' were, then, formed in precisely the same way as the new cases of Lithuanian, but in Tocharian there are more of them, while the number of old endings has been reduced.

We already saw (Section 5.4) that Old Irish acquired a special form for the vocative plural of the *o*-stems, namely the old nominative ending in *-*ōs*, when the (original) nominative was replaced by *-*oi*. Here a new category came into being (there was no vocative plural form before this) due to the fact that one form was split into two.

The definite adjective of Balto-Slavic is an innovation of this group. It resulted from the addition of a pronoun to the (indefinite) adjective. In Slavic and in Baltic independently this grew together into one form. Compare OCS *novъ-jь* 'new', gen. *nova-jego*, dat. *novu-jemu*, etc. The pronoun has another type of inflection than does the (indefinite) adjective, viz. the pronominal declension. (In some forms change took place in the endings of the adjective.) 'The good man' is *dobrъ-jь člověkъ*. Lithuanian originally had the same system: *geràs-is žmogùs* 'the good person'. Here then, two forms have become one. The same thing occurred with respect to the development of the future tense in French: *parabolāre habeō > parlerai* 'I shall speak'.

Germanic had two inflectional systems for the adjective, the so-called strong and weak declensions, as in Balto-Slavic. The weak declension, which had a stem ending in *-n*, was used for the definite adjective. For example Goth. (Matthew 5:19) *Iþ saei …, minnista haitada in þiudangardjai himine*; *iþ* s*aei …, sah mikils haitada …* 'And (he) who …, he will be called *the* least (*minnist-a < *-ōn*; weak) in the kingdom of heaven; and (he) who …, will be called great (*mikils < *-os*; strong)'. The weak adjective therefore often takes the article: *hairdeis sa goda* 'the good herder'.

The use of *ge-* in the perfect participle passive is a development of the West Germanic languages: OS *gi-worpan*, OHG *gi-worfan*, but OE *worpen*, ON *orpenn*, Goth. *waurpans* 'thrown'; OE *gebrocen* 'broken'.

A new category sometimes comes into being through a series of coincidences. Greek formed a passive aorist with *-thē-*. PIE had no passive. Greek has special forms for the passive in the aorist and in the future only, whereas other forms can be used as either medium or passive. This form with *-thē-* must be based on forms with *-ē* which

were intransitive, but which were also used with a passive meaning: 'it was in a mixed state' > 'it was mixed', *e-míg-ē* (pass. later *e-míkhthē*). When the element *-thē-* originated by means of reanalysis, it was reserved for the passive, probably in part owing to the meaning of the forms which had *-th-*; the origin of *-th-* is not well known.

8.2.3   Change

The Gothic passive provides us with a good example of how meaning can change. The forms were derived from PIE middle forms, cf. *bairanda* (ai = [ε]) 'they are carried', Gr. *phérontai*. The PIE middle voice had intransitive ('I wash myself') and transitive forms ('I do it for myself'). The passive developed out of the first of these. What must have happened is that the two middle forms merged (as in Greek), and that the first meaning developed into a passive (as in Greek), after which the middle meaning disappeared.

8.3   Syntactic change

Because the declension system (morphology) was often reduced, as we have seen in Section 8.2, relationships came to be expressed in a different way. If this took place by means of a group of words, there was a transition from morphological change to syntactic change.

We have already seen that most languages developed **prepositions**, that is to say, constructions with a preposition where previously a single form was sufficient. In *tóks' ṓmoisin ékhōn* 'with the bow over the shoulders' (Iliad A 45), the dative (= locative) is sufficient. But in *amphì d'ár ṓmoisin báleto ksíphos arguróēlon* '(and) around his shoulders he threw (the carrying-strap of) his sword with silver buttons', *amphí* 'around', has been added.

PIE had no **articles**. The same was also true for Sanskrit and Latin, and it is still the case for Russian. Many languages developed an article later on. Such is the case with Greek, where there are no articles in Homer, but there are in the later language. The indefinite article is less frequently found. There was none in classical Greek, but modern Greek has *énas* (from classical Greek *hén-* 'one'). Of the Celtic languages, Irish and Welsh have none, but Cornish and Breton have *un* (also from 'one', **oinos*, cf. Lat. *ūnus*, E. *one*).

Subordinate clauses were probably of little importance in PIE if they were used at all. Relations which are expressed in English by means of subordinate clauses were expressed in PIE by means of participles or verbal nouns. This means that the whole syntax of (the) subordinate clauses arose independently in the later languages, after the split-up of PIE. The number of (subordinating) conjunctions which date back as far as PIE is for this reason extremely limited.

A shift of meaning leads to **periphrastic** perfect forms, that is to say, to constructions with an auxiliary, like 'to have'. We already find this development in Hittite: GIŠGIGIR *tūriịan harụeni* 'we have harnessed the battle-chariot' (GIGIR is the Sumerian word for 'battle-chariot'; GIŠ is a Sumerian determinative, 'wood'; *tūriịan* is ntr. sg. of the participle ending in -*ant*; *har-ụeni* 'we have').

We find changes of **construction** but not of meaning in the IE languages where words in the neuter plural acquire a verb in the plural. This was not the case in PIE: a neuter plural corresponded with a verb in the singular. In Homer one comes across the old as well as the new construction side by side: *kaì dè doûra sésēpe neōn kaì spárta léluntai* 'and see the beams (the woodwork) of the ships (is) rotted and the ropes are hanging slack'. Here *doûra* and *spárta* are ntr. pl.; *sésēpe* is (perf.) singular, but *léluntai* is plural.

From the earliest times there was **congruency** in number (sg. or pl.) and person as between the subject and the verb. In Breton, however, the 3 sg. of the verb is used when the subject is expressed: *me so prest* 'I am ready' (*so* is 3 sg.); *enn amzer-nevez al laboused a gan* 'in the spring the birds are singing' (*amzer* 'time, season'; *nevez* 'new'; *gan* is 3 sg. of *kanañ* 'to sing', cf. Lat. *canere*).

The oldest IE languages indicate the presence of a **word order** wherein the object was placed before the verb (OV, object-verb). Cf. Hitt. (PCL=particle, LOC.PL= locative plural):

LÚMEŠ GIŠBANŠUR-*kan* 2 NINDA*mitgaimis appanzi*
manpl woodtable-PCL   2 breadmitgaimi   take

n-as-kan   *āppa suppaịas* GIŠBANŠURHI.A-*as tianzi*
and-them-PCL back pure   woodtables-LOC.PL   put
'The table-people take the 2 mitgaimi-loaves and put them upon the pure tables again'.

Here we see 'loaves' preceding 'take'. This word order is closely linked with other word-order rules. Thus, the adjective (e.g. *suppaịas*) precedes the noun ('tables'). Most of the Indo-European languages became VO-languages later in their development, with the reverse order. For example, OIr.

Im-díched in   cú   Laigiu   huili
defended the dog Leinster all
'The dog (= the hero Cuchulainn) defended all of Leinster.'

Here the adjective (*huili*) follows the noun.

We must content ourselves with these examples of changes which occur in the Indo-European languages.

8.4 Causes

There can be different causes for the observed changes in morphology and syntax. We have seen that a morphological system can be seriously damaged due to the influence of the sound laws, for example when the last syllable largely disappears, as in the Germanic languages. This may give rise to heavy restructuring of the grammar. But it is still the question whether this offers a sufficient explanation, for there are often possibilities for (analogical) restoration of the old forms when the sound change takes place.

Analogy itself leads neither to the disappearance of categories nor to the creation of new categories, for by definition it functions to extend such categories which already exist. Still, analogy may extend the scope of a certain variant to such a degree that it ousts other variants. For example, the presence of the prefix **ga-* in Gmc. past participles originally depended on the semantics of the predicate (*ga-* indicating perfective meaning, its absence, imperfectivity). This was still the situation in Gothic, and traces remain e.g. in Dutch dialects. By the generalization of **ga-* (*ge-*, *gi-*) to all participles this semantic distinction could no longer be expressed by the verb.

Reanalysis is another important driving force behind morphological and syntactic change. A case in point is the development of prepositions out of nouns (French *chez* < *casa*), of subordinating conjunctions from temporal adverbs (G. *weil* 'because' < 'while'), and of definite and indefinite articles (from pronouns or numerals). The periphrastic perfect is another famous example of this kind. The combination of possessive 'have' together with a verbal adjective indicating a state (as in 'I have (it) bought', 'they have (him) captured') has yielded a periphrastic perfect for instance in the Romance languages (French *j'ai fait*), in West Germanic (*I have done*, *ich habe getan*), in Albanian, in Bulgarian, and in many other languages. The process by which a linguistic expression can change from one category to another (as in noun to preposition, main verb to auxiliary verb, pronoun to conjunction) is called *grammaticalization*.

Finally we must mention situations of language contact as another major cause of change. It is easy to observe that many people tend to preserve the syntax of their own language when they begin to speak another language. It has been suggested with this phenomenon in mind that the transition to the VO word order in many Indo-European languages (see the preceding section) may be due to the influence of substrate languages, though this, too, is a theory for which proof is lacking.

Chapter 9

Internal Reconstruction

9.1   Introduction

Internal reconstruction means the reconstruction of older stages of linguistic development by means of data from one particular language, and usually from one particular period of its history. The fact is that many languages show all kinds of alternations, the origins of which make us curious. Let us look at a very simple example. For Gr. *patḗr*, gen. *patrós* the analysis *pat-ḗr*, *patr-ós* 'father', would seem to be obvious. If we employ the same analysis to *anḗr*, *andrós* 'man', we then get *an-ḗr*, *an-d-r-ós*, which leaves us with a *-d-* for which we can offer no explanation. The solution is that *-nr-* became *-ndr-* phonetically. This phenomenon, that a consonant appears between two other consonants (epenthesis), is a known one; the explanation is therefore probable. Naturally, the explanation is discovered sooner the more one knows about the historical development of the language in question.

Internal reconstruction does not mean reconstruction with the help of dialect forms, for that is actually a kind of comparative linguistics. Thus, the word for 'dawn' in Attic Greek is *héōs*, but in the closely-related Ionic Greek it is *ēṓs*. Even if we knew nothing more, it is still probable that the one form has lost the *h-* and that in the other the long *ē* has been shortened (before vowel), for these are normal developments. Naturally, nothing can be said about the accent solely on the basis of these two forms. What we are doing here, then, is comparing forms from two different languages or dialects.

Neither is the use of archaisms meant. For Lat. *honor* we are told that there was once the older form, *honōs*. That would be working with older forms, whereas internal reconstruction by definition always works with forms from only one particular stage in a language's development. But in practice we are naturally happy to make use of all the data available to us.

9.2   Examples

The genitive form of Lat. *genus* is *generis*. The genitive ending is *-is*, thus *genus* shows a stem *gener-*. One can now suspect that both of these forms originally had the same final consonant, thus that both had *s*, or *r*, or something else. Because a transition from *s* to *r* is something that often happens, especially between vowels, it is probable that

gener- came out of **genes-*. That this is correct appears from comparisons, for example with Skt. *jánas*, gen. *jánas-as*. But the hypothesis that both forms once had the same final consonant could, naturally, also be incorrect. The genitive of *femur* 'shin-bone' is *femin-is*, of which one might also think that both stem-forms originally must have had the same final consonant. Furthermore, the development *r > n* or vice versa is much less frequently found than is *s > r*. Comparison with Sanskrit, for example with *yákṛ-t*, gen. *yakn-ás*, points to the existence of words whose stems ended in *-r* (we leave the *-t* out of consideration) or *-n*. These were of Indo-European origin, for we find traces of them in various languages (and moreover there is no sound development in any of these languages which could be used to offer an alternative explanation). We assume that we are dealing here with two different suffixes (*-r* and *-n*).

The accusative of Gr. *ēṓs* 'dawn' was *ēō*. That is an unusual form. The accusative in Greek usually ended in *-n* or in *-a*. Thus *eikṓn* 'image' has *eikóna* for its accusative. It would seem obvious that *ēō* developed out of *ēoa. Moreover, the word could have had a stem ending in *-s*, for *s > Ø* is a development which is often found. Thus, a (still) older form would have been *ēos-a. That this is so appears from a comparison with Sanskrit *uṣā́s*, *uṣā́s-am* (and Lat. *aurōra* < **ausōs-*; Greek lost the *s* as well as the *u* of *ausōs).

In the case of reduplication, as in Greek *dí-dō-mi* 'to give', the first consonant is repeated with an *i*. But in *títhēmi* the *t-* has no aspiration (or better: we find *t-* instead of *th-*; *th* is one phoneme). Apparently, two aspirated sounds were not tolerated in close proximity, and as a consequence the first lost its aspiration. This is called 'breath dissimilation', or Grassmann's Law. It explains forms such as *thríks* 'hair', gen. *trikhós*: in the second form the *th* lost its aspiration, in the first the *kh* lost its aspiration before *s* and the *th* was retained (see 11.4.3).

Lat. *nix* 'snow', gen. *nivis* displays two stems, *nik-* and *niv-*, and in *ninguit* 'it is snowing' we have *nigu-* (the *-n-* is a present infix, as in *vincō* 'conquer' as opposed to the perf. *vīcī*, *victus* which we will further leave out of our consideration). It can hardly be otherwise but that *gu* was the original final consonant (one phoneme, *gʷ*), which became voiceless before *s* and lost its labial character (> *k*), while it became a *v* between vowels.

9.3 Vowel alternation (Ablaut)

In this section and the following we will be discussing phenomena of a more extensive nature which have been extremely important for the history of the Indo-European languages, and which can be reconstructed with the help of internal reconstruction. (In practice, internal reconstruction and the comparative method are used simultaneously.)

The 3rd pl. pf. pass. Gr. *te-tákh-atai* 'they are posted' has an ending *-atai* which differs from the normal ending *-ntai*, e.g. in *pé-pha-ntai* 'they have been killed'. Ferdinand de Saussure, while still a gymnasium student, concluded from the fact that the strange ending occurred after a consonant, and *-ntai* after a vowel, that an *-n-* between consonants changed to *a* (the *n* was 'vocalic'; it is often notated as *n̥*). The conclusion, then, was based on a comparison within one language.

Greek often displays vowel alternations, as for example:

ei/oi/i:	*leíp-ō*	*lé-loip-a*	*é-lip-on*	to leave
	eíd-ō	*oȋd-a*	*íd-men*	to know
eu/ou/u:	*eleús-omai*	*el-ḗlouth-a*	*ḗluth-on*	to come
	reȗ-ma	(*ró-os*)	*perí-rrutos*	to stream
en/on/a:	*mén-os*	*mé-mon-a*	*mé-ma-san*	to think
er/or/ra:	*patér-a*	*eu-pátor-a*	*patrá-si*	father

Next to *ei/oi/i* and *eu/ou/u* one naturally expects *en/on/n* and *er/or/r*. We just saw that *n* between consonants changed into *a*. Now we can add to this that *r* between consonants becomes *ra* in Greek (*-si* is the dative plural ending). We also see that, at an earlier stage, all of these changes run precisely parallel, and that we are in fact dealing with one essential system, *e/o/Ø* (Ø = zero). The long vowels also belong to this system, as the following comparison makes clear:

patḗr	*eu-pátōr*	*patéra*	*eupátora*	*patrási*	father
kẽr				*kradíē*	heart
	Dor. *pṓs*		*póda*		foot

(It is not usual for all theoretically possible forms to actually occur.)

We thus get a system *e/o/Ø/ē/ō* solely on the basis of internal reconstruction in Greek. Comparison with other languages shows that this system of vowel alternation (ablaut) has been inherited from Indo-European. It is of fundamental importance for the history of the Indo-European languages.

9.4   The laryngeal theory

Greek also displays a completely different system of vowel alternation, namely:

ē/ō/e:	*tí-thē-mi*	*thō-mós*	'heap'	*the-tós*	to lay, put
ā/ō/a:	*hí-stā-mi*			*sta-tós*	to stand
	phā-mí	*phō-nā́*	'voice'	*pha-tós*	to say
ō/ō/o:	*dí-dō-mi*	*dō-ron*	'gift'	*do-tós*	to give
	põ-ma 'drink'			*po-tós*	to drink

Here the long vowels occur frequently, while in the previous system they are infrequently found. Moreover, we find no forms with Ø. And if we look to see where the different forms are found, it appears that *ē*, *ā*, *ō* in the second system are parallel with *e* (*ei, eu* etc.) of the first system, and *e*, *a*, *o* of the second system with Ø of the first:

I	*reū-ma*	*perí-rrutos*	*eu/u = e/Ø*
	eĩ-mi	*í-men*	*ei/i = e/Ø*
II	*põ-ma*	*po-tós*	*õ/o*
	phā-mí	*pha-tós*	*ā/a*

The correspondence between the two systems may, then, be set out as follows:

I	*e*	*o*	Ø	*ē*	*ō*
II	*ē*	*ō*	*e*	?	?
	ā	*ō*	*a*	?	?
	ō	*ō*	*o*	?	?

Basing himself on this situation, Ferdinand de Saussure made the following brilliant proposal. Suppose that the three series of the second system could be traced back to one system, namely, the same as the first system. That would be possible if we assumed that *ē* was *e* + something else and that *ā* was also *e* + something else (but something different than in the case of *ē*). Thus as follows:

I	*e*	*o*	Ø
	ei	*oi*	*i*
II	*eE*	*oE*	*E*
	eA	*oA*	*A*
	eO	*oO*	*O*

In this way there would be only one ablaut system, because the second would then in fact also be based on *e/o/Ø*. That this idea is correct is naturally not self-evident; it is a possibility. Comparison with other languages and countless other arguments confirm, however, the probability that the idea is correct after all.

The proto-language would have had, then, three phonemes, *E*, *A*, *O*. De Saussure called the three phonemes 'coefficients sonantiques' (sonantic elements), because he compared them with (the sonants) *i*, *u*, *r* etc., in *ei/oi/i* etc. Later on they were called laryngeals, because it was suspected that they had once been laryngeal (and/or pharyngeal) consonants. They are now mostly reconstructed as $*h_1$, $*h_2$ and $*h_3$, *h* being a cover symbol for 'consonant of unknown phonetic nature but probably of velar, pharyngeal or glottal articulation place'. Next to the ablaut series *e/o/Ø* there were formerly three series with long vowels which now appear to contain a laryngeal:

ē/ō/ə   now: $eh_1/oh_1/h_1$
ā/ō/ə $eh_2/oh_2/h_2$
ō/ō/ə $eh_3/oh_3/h_3$

The theory was launched in 1878 when de Saussure was only 21 years old! It took, however, until after the Second World War before the theory began to acquire general acceptance. Its consequences have been very far-reaching. It is certainly the most important single discovery in the whole history of Indo-European linguistics.

9.5   The place of internal reconstruction

Internal reconstruction has always been used. Only recently has it been emphasized that its principles are quite different from those of comparison, which we will be describing in the following chapter.

In comparing languages the process of internal reconstruction is always a first step, whenever it is possible to apply it. To put it differently, before comparing forms from other languages, one must first evaluate a form within the system of its own language. If this step is omitted we might draw incorrect conclusions about the external connections of a form. In practice, of course, the historical linguist goes back and forth between internal reconstruction and comparison, because actual practice is usually not so simple as the examples given here might suggest. The main problem is usually that of locating and identifying the core of the problem, in other words, framing the problem. The discovery of the laryngeal theory was, by the way, not simple at all, as we saw, and also not self-evidently correct. It took a real genius to see it. It often requires a genius to see things which afterwards seem so simple.

Reconstruction

Chapter 10

The Comparative Method

10.1   Introduction

Now that we have examined the principles of language development, it is time to pay attention to the application of those principles: if we compare languages and language forms, what procedure should we follow, and how should we go about drawing our conclusions? How does the comparative method actually work?

First of all, a warning: there is no single method which automatically guarantees correct results. In theory, there should be such a method but in practice it is usually not the case. The reason for this, I think, is that the number of possible developments which language can take is so great. It is also not the case that things are simple in the beginning, or, alternatively, that they begin to get easier the further we proceed. What we can say is that once a certain principle has been discovered, applying it provides a solution for a group of phenomena; in such cases, things do indeed become 'easier'. But soon enough we again reach a point of stagnation beyond which further progress cannot be pushed. All in all, the inquiry remains complex from beginning to end.

Oftentimes, solutions are found when the 'proper' method is not being followed. Indeed, it is often the case that we do not even know how we reached a particular solution that lies in our hands. We were looking at a problem, we applied the rules of the method as we were supposed to do, and we could not solve the problem. Later, we look again, and yet again, and suddenly the solution is there, though one is usually hard put to explain where it came from. Our minds make jumps of the strangest kinds, and it is unexpected mental leaps of this kind which often enough provide us with just the breakthrough that was needed. Often, too, a solution is found for problem A when one is busy working on problem B: one suddenly recognizes that the key to problem A has been found.

Of course, none of this alters the fact that we still need to follow a certain number of 'methodical' steps, and it is certainly necessary after a solution has been found to go over the rules so as to ensure that the conclusion we have come to is a tenable one. Now we must admit that there is hardly one method which could be referred to. There are a few rules, but how one is to work with them is something that cannot easily be laid down in black and white terms.

There are, first of all, a number of prior conditions which must be fulfilled: *a*. One must know the languages from which the material has been taken. One might say that

the researcher must be capable of employing the method of internal reconstruction (as described in Chapter 9) in order to take the first, preliminary steps. This requirement applies to all of the languages which happen to be relevant to the problem being dealt with. One must know as many languages as possible in order to know what they look like and how they work. If you wish to discover something about language, the more you know about language the better, and the best way to acquire such knowledge is to learn as many languages as possible. When applying the method of reconstruction, relevant knowledge about what is linguistically possible can play an important role; to put it another way, one will be employing considerations of a typological nature. *b*. It is also necessary to know as much as possible about the historical developments of languages. The more 'cases' one knows of, the more quickly one will recognize certain patterns of development one has seen before. This applies to sound, to analogies and to other kinds of linguistic development as well.

What kind of guidelines could, then, be set down? I think the following:

1. See what information is generated by internal reconstruction.
2. Collect all material that is relevant to the problem.
3. Try to look at the problem in the widest possible context, thus in relation to everything else that may be connected with it. An example: If you should wish to evaluate a form of the Gothic pronoun, you would have to (a) examine the complete paradigm of that pronoun; (b) you would have to examine the paradigms of all the Gothic pronouns; (c) you would have to examine the Gothic adjective, for the adjective, in part, follows the declension of the pronoun; (d) you would have to examine the Gothic noun, for the declension of the nouns and the pronouns affect each other; (e) you would have to examine a–d above in all of the other Germanic languages; (f) you would have to examine a–d above in all of the other Indo-European languages as well. It will be clear from this that the evaluation of a single form in only one particular language is no simple matter.
4. Assume that corresponding forms, that is to say, forms whose meaning (probably) and whose structures (probably) seem to be alike, all derive from one common ancestor. This is very often *not* the case, but one must assume that the forms in question have derived from one form according to the operation of the sound laws: if this assumption is not made, chaos will be the result. Only when it is clear that the assumption cannot be correct should one of the two forms be considered an innovation. It is possible, however, that *both* forms do not directly derive from one previous form, but rather have been transformed in the process of their respective developments. This possibility must be held in reserve, but it is first necessary to try and find a solution by assuming that only one of the forms may have undergone transformation. The principle at work is that one should look for the simplest solution first.
5. The question of how deviant forms should be evaluated is a difficult one to answer. When a deviant form can be seen as an innovation within a particular language (or group of languages), the solution is that the form in question is young and as such

cannot be important for the reconstruction of the original form. Whenever a deviant form resists explanation it becomes necessary to consider the possibility that the very form in question may be one that preserves the original. This is an important and difficult point. The following footnote from a handbook (Monteil 1970: 273 n. 1) provides a good illustration of this problem: 'The opposition in Sanskrit between a primary ending [in the present tense] *-tha* and a secondary ending [in the past tense] *-ta* has no corresponding form in Greek or anywhere else, and must be secondary'. Since there is, however, no way thinkable by which the difference could be explained as secondary, thus as an innovation of Sanskrit (or of Indo-Iranian), it seems to me that the opposition must in fact be an old one. I am of the opinion, then, that the very facts brought forward here should lead us to the opposite conclusion.

Another example. The attested forms point to $*$-*om* or $*$-*ōm* for the ending of the genitive plural of the Indo-European languages, but Gothic has *-ē* (which may have come out of *-ēm* but not out of the forms given above). An explanation as an innovation within Gothic was, until recently, unknown (but see Section 10.5.2). It was therefore postulated that PIE must have had $*$-*ēm* next to $*$-*ōm*. Since the Gothic ending is also unique with respect to the other Germanic languages, it seems more probable that *-ē* is not an old form. The point is that some scholars believed that the form must be an innovation, even though they did not know how it actually developed.

6. For every solution the assumed (new) sound laws must be phonetically probable, and the analogies must be plausible.

7. The reconstructed system must be probable (typological probability). If one should reconstruct a system which is found nowhere else in any of the known languages, there will always be room for doubt, to say the least. On the other hand, every language is unique, so there is always the possibility that something entirely unknown must be reconstructed.

10.2   Voiced stops in Avestan

We will begin with a relatively simple example from Indo-Iranian. In Avestan there are three voiced stops, viz. *b*, *d*, and *g*. In Sanskrit, the ancient language of India which is closely related to Avestan, these three Av. stops correspond with six different stops: three of them are also voiced stops, Skt. *b, d, g*, while the three others are 'voiced aspirate' or breathy voiced stops, Skt. *bh, dh* and *gh*. Here are some correspondences between the two languages: (Av. *γ* from $*$*g* between vowels and resonants)

> Av. *g* = Skt. *g*: Av. *gar-*, Skt. *gar-* 'to wake', Av. *gao-*, Skt. *gó-* 'cow'
> Av. *g* = Skt. *gh*: Av. *garəma-* 'warm(th)', Skt. *gharmá-* 'glow', Av. *darəγa-*, Skt. *dīrghá-* 'long'

Av. *b* = Skt. *b*: Av. *bāzu-*, Skt. *bāhú-* 'arm', Av. *baod-* 'to notice', Skt. *bodh-* 'to awake'
Av. *b* = Skt. *bh*: Av. *baya-* 'share', Skt. *bhága-* 'riches', Av. *bara-*, Skt. *bhara-* 'to carry'
Av. *d* = Skt. *d*: Av. *daēuua-* 'demon', Skt. *devá-* 'god', Av. *duš-*, Skt. *duṣ-* 'bad-'
Av. *d* = Skt. *dh*: Av. *darši-*, Skt. *dhṛṣṇú-* 'bold', Av. *daēnu-*, Skt. *dhenú-* 'female animal'

How can we decide which language preserves the older situation as regards these stops? In theory, either Sanskrit has made six stops out of three earlier ones, or Avestan has reduced an original number of six stops to three (of course, other solutions are conceivable, such as that both languages have reduced an original number of nine or more stops; but that is an unnecessary complication at this stage). If the former had happened, we would hope to find a (phonetic) conditioning under which the split from three to six stops had taken place. After all, phonemic splits normally have phonetic causes (see Section 4.7). However, such a condition cannot be found: Skt. *bh, dh* and *gh* can be found in various positions in the word (the examples above are mainly of the word-initial position because of later complications found in other positions in the word) and so can *b, d* and *g*.

Conversely, if Avestan originally had six stops which it then reduced to three, it would be quite normal not to find any condition for this reduction. For instance, *b* and *bh* may have merged into *b* by way of a mere simplification in the pronunciation of the breathy voiced stops which lost the breathy aspect (-*h*).

Thus, if we take into account only the data given above and search for the solution which requires the least additional assumptions, we will hypothesize that Sanskrit preserves the older system (six stops) which was simplified in Avestan (three stops). In this way we do not need to posit an unexplained split of *b, d, g* into two different stops, and we can understand what happened in Avestan as a trivial linguistic development (viz. as the simplification of a more complicated kind of stop system).

This solution turns out to be the correct one in particular when we start comparing the stop systems of other ancient Indo-European languages, which we will do in Section 11.3.

10.3   OCS *nebese* – Gr. *népheos*

Next we will compare two entire words in two different languages and try to reconstruct their common preform. I will at first skip rule 3 above (which requires us to see everything in context); otherwise the example will become more complicated than intended. Compare:

OCS *nebese* – Gr. *népheos*

These forms seem fairly similar, and both are the genitive singular of a word that means 'heaven' and 'cloud', respectively; both are neuter. The meanings provide no problem: 'heavens' would have developed from 'cloud'. This basis allows us to speak of corresponding forms, so that we can move ahead to a comparison on the assumption that both developed out of one and the same PIE original (rule 4). What was the original form and what happened to it?

The first part, *ne-*, presents us with no problems. But this remark (which is also an interpretation) still requires some further explanation. There are two cases here. If we knew nothing of the two languages from which these words come, there would be no problem in assuming that an original *n* in both languages simply remained an *n*; and the same would apply to the *e*. But this does not mean that such a conclusion is therefore the correct one. If we would know something of the languages in question, we would look to see if it is indeed true that in both languages *n* usually remains an *n* and *e* remains *e*. It so happens that in these languages our assumption is very probably correct.

It is more difficult to draw a conclusion about the correspondence *b – ph*. One could reason that it is more probable that one form had lost its aspiration than that the other acquired it (though the latter is not impossible). Whether the original sound was voiced or voiceless cannot be determined. It is likely that a consonant between two vowels was voiced. We could note the sound as P^h, a (probably) aspirated labial occlusive.

Internal reconstruction will take us further. Greek has nom. *néphos*, gen. *népheos*, later *néphous* /*nephōs*/. Greek usually contracted two adjacent vowels into one. It is therefore probable that in *népheos* (not so long ago) a sound was dropped between the *e* and the *o*. It also seems obvious that the stem in the genitive ended in the same consonant as in the nominative (in both languages the neuter gender in the nominative case has no ending), thus, that the older form was **nephes-os* (see Chapter 9). We often see *s* (via *h*) becoming zero, so that the assumed development is (phonetically) probable. The **-s-* is confirmed by OCS *nebes-e.*

The correspondence *e – o* presents a problem, for we have found *e – e* in the first two syllables. It is certainly possible that a vowel might develop differently in different contexts, for example in the final syllable of a word (which would here mean *e > o* in Greek). But internal reconstruction shows no such thing in Greek. Change within OCS is also a possibility, but we happen to know (from other facts) that this has not been the case. We can see this, for example, by looking at the nominative in OCS: *nebo*, gen. *nebese*. A comparison of *nebo* with Gr. *néphos* confirms that the *o* in OCS was retained (in final syllable). The *e* and the *o*, then, cannot be traced back to one form. We can proceed no further here.

The comparison of *nebo* with *néphos* does make it probable that in OCS a final *-s* disappeared, and that this also probably happened in the genitive. We arrive, then, at **neP^hes-es/-os.*

Now we can take other languages into consideration. Skt. *nábhas-as* confirms the reconstruction, if we assume that *e* and *o* became *a* here. Unfortunately, we get no information about *-es* : *-os*. Skt. has a *bh* (one phoneme), which makes the reconstruction of *b^h* probable. We may add that the accentuation of Sanskrit happens to coincide with that of Greek. We now have *$nébhes-es/-os$*.

Hitt. *nepis-as* shows a *p*. It appears (from other cognate forms) that Hittite *p* can correspond with OCS *b* and with Gr. *b*, *ph*. Probably, two original phonemes have become one (compare Section 10.2). Hittite *e* reflects accented *$é$* whereas Hitt. *i* continues unaccented *e*. Hitt. *-as* has an *a* which could derive from *o*. This confirms, then, the *o* of Greek, but it still offers no explanation for OCS *e*. This is another problem which remained unsolved until recently.

We have presented this material in a piecemeal fashion, and there is no particular reason why we had to begin with Old Church Slavonic and Greek. According to the rules laid out above, we need to compare all the relevant material simultaneously, so:

OCS	*nebo*	Gr.	*néphos*	Skt.	*nábhas*	Hitt.	*nepis,*	etc.
	nebese		*népheos*		*nábhasas*		*nepisas*	
	etc.		etc.		etc.		etc.	

See Section 13.2.6c for a more detailed reconstruction of this paradigm.

10.4   The passive aorist of Indo-Iranian

In Sanskrit and Avestan, an interesting verb form is found which does not occur in any other branch of Indo-European. It is usually called the *passive aorist*. It consists of a 3 sg. verb form with passive or intransitive meaning, which in Sanskrit takes the augment:

> Skt. *ákāri* 'was made' (*kar-* 'to make'), *ájani* 'was born' (*jan-* 'to be born'), *ádarśi* 'was seen' (*darś-* 'to see')
> Avestan *vācī* 'was spoken' (*vak-* 'to speak'), *srāuuī* 'was heard' (*srauu-* 'to hear')

Internal reconstruction tells us the following. The passive aorist shows the vowel *ā* in the root when the root had the structure *CaC*, but *a* with roots of the structure *CaRC* (in *á-darś-i*). Some roots of the type *CaC* are exceptional in that they show short *a* (e.g. Skt. *ájani*), but we know from other sources that these were originally roots of the type *CaRC*, viz. *$janH$-*. This is enough to provide us with a mechanical PIE reconstruction of the passive aorist, since the vacillation between *a* (before *CC*) and *ā* (before *CV*) in Indo-Iranian is known from other phenomena too. It has long been established that *a/ā* must in such cases reflect PIE short *o* (the lengthening

to *ā* is called Brugmann's Law, see Section 11.6.1). Thus, we can reconstruct a PIE antecedent *CoCi (and *CoRCi) of the passive aorist, e.g. *ákāri* < **(h₁é-)kʷor-i*. The presence of the augment may but does not have to date back to Proto-Indo-Iranian.

Such a verb form *CoCi, however, is not found anywhere else in Indo-European. The root vowel *o is less frequently found in PIE verb forms than *e, and the suffix **-i* is not a known verbal ending. In theory, Indo-Iranian **-i* can also reflect PIE **-H*, that is, a word-final pharyngeal or glottal consonant. Such consonants do occur as verbal endings in PIE, e.g. in the paradigm of the middle voice. But the specific form *CoC-H is not known from anywhere.

The solution can be found by comparing the other Indo-European languages. We must search for the expected reflex of PIE *CoCi in those languages. It soon appears that there was a category of *i*-stem nouns with the very structure **CoC-i-* which is continued in several branches:

Celtic: OIr. *guin* 'wounding' < *gʷʰoni, to the root **gʷʰen-*;
Greek: *trópis* 'keel' (to *trépō* 'to turn');
Germanic: Goth. *balgs* 'leather bag', OIc. *belgr* 'skin; bellows' < PGm. **balgi-* 'bellow' (to **belg-* 'to swell');
And probably also in Indo-Iranian itself: Skt. *ghāsí-* 'food' (to *ghas-* 'to devour').

As for their meaning these are action nouns, which refer to the object or the result of the action: 'to break' > 'which has been broken, potsherd', 'to swell' > 'swelling'. In certain contexts it is not far from the meanings 'breach' or 'swelling' to a passive interpretation. For instance, from the root **kʷer-* 'to make, construct' a noun *kʷor-i 'construction' was derived. If used predicatively in 'This house is a construction', a re-interpretation as 'This house has been constructed' is understandable. The addition of the augment in Sanskrit clearly shows the shift to the status of a verb form.

Hence, by means of internal reconstruction and the comparative method, it can hypothesized that a PIE (neuter) *CoCi came to be reinterpreted as a verbal form with passive semantics in Indo-Iranian.

10.5   The middle participle

The participle of the middle (a category of verb forms which indicate that a subject is indirectly involved in the action, that is, has an interest in the action) displays the following forms:

	thematic		athematic
Skt.	*-a-māna-*		*-āna-*
Prakrit		*-mina-*	
Av.	*-a-mna-*		*-āna*
Gr.	*-o-menos*		*-menos*
Toch. A		*-māṃ*	
B		*-mane*	
Lat.	(*-u-mnus*		*-mina*)

In Latin we find the suffix (lexicalized) in two nouns only: *alumnus* 'apprentice' < 'being fed, raised' and *fēmina* 'woman' < '(she) who suckles (for herself)'.

Until recently it was not possible to reconstruct a single protoform for these forms. The suffix was reconstructed as **-meno-*, **-mno-* (which does not explain Skt. *-māna-*; it was thought that *ā* came from *-āna-*) along with **-ono-* (> Skt. *-āna-*). And nevertheless, the solution is quite simple, even though it took two hundred years to discover it.

The problem can be solved solely on the basis of the Indo-Iranian forms. Those in the left-hand column above are the so-called thematic forms: they are preceded by a thematic vowel, here **-o-*. The athematic forms do not have such a vowel, and are (usually) preceded by a consonant. It is now easy to think that what we are dealing with here is actually one form which has undergone a different development after a vowel than after a consonant.

It is not possible to trace the four forms back to one single form (we leave the later *-mina-* out of our considerations for the time being). If we set one aside as irregular, Skt. *-māna-* presents itself as a possibility: on the one hand it cannot be traced back, together with Av. *-mna-*, to one single form, and on the other hand it could have its *ā* from *-āna-* (as has long been surmised). If we compare Av. *-mna-* with *-āna-* we must look for a form with *m-* that gives us an *a*. Now we know that a vocalic *m* (*m̥*) becomes an *a*. The *m*, in the athemathic forms, occurred after the consonant and could, then, have been vocalic. We are looking, therefore, for a consonant that lengthened *a* (*-m̥Xna-* > *-aXna-* > *-āna-*), but which disappeared in Av. *-mna-* (*-a-mXna-* > *-a-mna-*). Such consonants were the laryngeals (see 9.4). A laryngeal became zero between consonants in Avestan, but in Sanskrit it became *i*. Sanskrit then replaced the *i* with the *ā* of *-āna-*. After this had been seen, it was realized that the form with *i* did indeed occur in Indic, namely in Middle Indic. This form must therefore derive from some other Old Indic dialect than the one which is known to us from the texts. The dialect form, from Prakrit, had previously been completely unclear.

If we assume the operation of the 'e-coloring' laryngeal (*h₁), Gr. *-menos* would be the regular thematic form. Toch. *ā* (Toch. B *a* < PToch. *ā*) can also derive from a

laryngeal. In fact, it was the Tocharian form which put someone on the right track. Lat. *-m(i)nus* goes back to *-*manos* < *-*mh₁nos*. The form was, then, *-*mh₁nos*. If we should ask ourselves why this was not seen sooner, we can answer — quite apart from the fact that the train of reasoning employed is not the easiest — that this was due to the fact that *h_1 > Gr. *e* does not often occur and was long disputed, so that the Greek form was always thought of as pointing to PIE *e. It is often the case that a solution is blocked by something that seems very evident, but in reality is quite other than what it seems to be. At such moments a new insight is needed to break through the impasse.

Part II

Comparative Indo-European Linguistics

Phonology

Chapter 11

The Sounds and the Accent

This chapter presents a complete overview of the phonological reconstruction of PIE. Text and tables provide a large amount of information on the reflexes of PIE sounds in the major daughter languages. It is easy to get lost in this wealth of data. In order to find their way, readers may start by focusing on only a few of the relevant languages. Sanskrit and Greek are the easiest languages to start with since they are the most transparent, though they do not always retain the most archaic situation.

In the last section (11.10) a survey will be given of the developments which took place between PIE on the one hand and English on the other.

11.1   The PIE phonemic system

The phonemic system that we now reconstruct for PIE is the following:

	Traditional reconstruction			Modern reinterpretation (see 11.3.6)		
CONSONANTS	occlusives/stops					
	labials	p	b	b^h	$(= p$:	p'	$p)$
	dentals	t	d	d^h	$(= t$:	t'	$t)$
	palatals	$\acute{k}$	$\acute{g}$	$\acute{g}^{\,h}$	$(= \acute{k}$:	$\acute{k}'$	$\acute{k})$
	velars?	k	g	g^h	$(= k$:	k'	$k)$
	labiovelars	k^w	g^w	g^{wh}	$(= k^w$:	$k^{w'}$	$k^w)$
	fricatives	s					
	laryngeals	h_1	h_2	h_3	$(= ʔ$	$ʕ$	$ʕ^w)$
	sonants						
	liquids	r	l				
	nasals	m	n				
	semivowels	i	u				
VOWELS		e	o				
		$\bar{e}$	$\bar{o}$				

Unlike most other introductions into Indo-European, we reconstruct no PIE phoneme *a (see Section 11.6.2 for justification), nor *ā, *ī or *ū (see 11.8). The PIE diphthongs (*ei, *oi; *eu, *ou) are actually combinations of two phonemes, e + i, etc. *pʼ etc. indicate glottalized consonants (see Section 11.3.6).

The sonants can have consonantal and vocalic allophones, e.g. r/r̥, i̯/i. Thus r̥ is a vocalic r, i̯ is a consonantal i, etc. Yet r̥ was merely an allophone of r, i̯ an allophone of i, etc. Therefore the diacritic signs ˳ and ‿ are superfluous for the phonemic analysis of PIE. In order to obtain a good understanding of the structure of PIE, i and u should be thought of as consonants.

As cover terms for groups of sounds we use *C* for consonants, *T* for stops, *R* for sonants, *N* for nasals, *V* for vowels. *H* refers arbitrarily to any particular laryngeal, or to an unknown laryngeal.

11.2   Preliminary remarks on ablaut

Of essential importance for PIE is the *ablaut* or vowel alternation. This means that *e*, *o*, Ø (zero), *ē* and *ō* can be found to alternate in the same position or 'slot' in a word. The element Ø (zero) means: nothing, no vowel. For each morpheme in each different function (such as different case forms or verb forms), it was grammatically fixed which ablaut vowel occurred. Not all the five ablaut possibilities occur with every morpheme. In particular the vowels *ē* and *ō* are rare. An example of a suffix which shows all five ablaut forms is:

-ter-/-tor-/-tr-/-tēr-/-tōr-

From Gr. *patḗr* 'father', *eupátōr* 'of good descent' we find:

	acc.	acc.		gen.	nom.	nom.
Gr.	*pa-tér-a*	*eu-pá-tor-a*		*pa-tr-ós*	*pa-tḗr*	*eu-pá-tōr*
				loc. pl.		
			PIE	*-tr̥-su*		
			Skt.	*pi-tṛ́-ṣu*		
			Gr.	*pa-trá-si*		

([r̥] became *ra* in Greek).

In the later languages the vowels undergo all kinds of changes, which often obscure the original distribution of ablaut variants. For PIE, however, it always comes down to these five possibilities:

e / o / Ø / ē / ō.

We will meet ablaut variants of PIE morphemes on nearly every page of the following subsections on phonology. The origin and function of ablaut will be discussed in

more detail in the chapters on morphology: Chapter 12 (introduction) and 13 to 18 (PIE word classes).

11.3   The stops

11.3.1   Labials and dentals

PIE	Skt.	Av.	OCS	Lith.	Arm.	Alb.	Toch.	Hitt.	Gr.	Lat.	OIr.	Goth.
*p	p	p	p	p	h-, w[1]	p	p	p, pp[5]	p	p	Ø	f, b[10]
*b	b	b	b	b	p	b	p	p	b	b	b	p
*b^h	bh	b	b	b	b-, w[2]	b	p	p	ph	f-, b[8]	b	b
*t	t	t	t	t	t'	t	t, c[4]	t, tt, z[6]	t	t	t	$þ$, d[10]
*d	d	d	d	d	t	d, dh[3]	ts, $ś$[4]	t, s[7]	d	d	d	t
*d^h	dh	d	d	d	d	d, dh[3]	t, c[4]	t	th	f-, d, b[9]	d	d

1. h (or Ø) in anlaut, w after a vowel
2. b in anlaut, w between vowels
3. dh between vowels
4. c, $ś$ before e, $ē$, i, $ī$ ($d >$ Ø before consonant, $t\underset{\circ}{i}$, $d^h\underset{\circ}{i} > ts$)
5. p- word-initially, -pp- between vowels
6. t- word-initially, tt between vowels; *$t\underset{\circ}{i} > z$
7. *$d\underset{\circ}{i} > s$
8. f in anlaut
9. f in anlaut, b after u, r, before r, l
10. f, $þ$ in anlaut and directly after the PIE stress

For the sound shifts of Armenian and German see Section 11.3.8. For the interpretation of traditional *b, *d as glottalized consonants see Section 11.3.6. The stops traditionally reconstructed as voiced aspirates *b^h, *d^h yield breathy voiced stops in Sanskrit, aspirates in Greek and Italic, and plain voiced stops elsewhere (except in Tocharian). It is possible that in Hittite pp renders a voiceless and p a voiced sound. Examples:

PIE *ped-/pod- 'foot': Skt. pad-, Arm. otn, Gr. pod-, Lat. $pēs$, ped-is, Goth. $fotus$, E. $foot$.

PIE *neb^hos 'cloud': Skt. $nábhas$, Av. $nabah$-, OCS $nebo$, Lith. $debesìs$, Hitt. $nepis$, Gr. $néphos$, Lat. $nebula$, OHG $nebal$.

PIE *$ters$-/trs- 'to dry out, to thirst': Skt. $tŕ\underset{\circ}{s}yati$, Arm. $t'ařamim$, Alb. ter, Gr. $térso$-mai, Lat. $torreō$, Goth. ga-$þairsan$ ($ai = [ɛ]$) < *$ters$-, $þaursus$ ($au = [ɔ] <$ *u) < *trs-; cf. E. $thirst$.

PIE *h_1uid^heu-, -uh_2- 'robbed, unmarried; widow': Skt. *vidhávā*, OCS *vьdova*, OPr. *widdewū*, Gr. *ḗitheos* 'unmarried young man' (with *ē*- from metrical lengthening of *e*-), Lat. *vidua*, OIr. *fedb*, MW *gweddw*, Goth. *widuwo*, E. *widow*.

Exercise 1

Reconstruct the PIE obstruent from which the bold-face consonant is derived:

a. Goth. *tuz*-, Skt. *duṣ*-, Gr. *dus*- 'bad'
b. Lat. *ferre*, Goth. *bairan* 'carry', OIr. -*beir* 'bears'
c. Arm. *hur*, Gr. *pūr*, OHG *fiur* 'fire'
d. Arm. *stipem* 'to force', Gr. *steíbō* 'to trample'
e. Goth. *mitan* 'to measure', Gr. *médomai* 'to plan', OIr. *med* 'scales'
f. Lith. *bãsas*, OCS *bosъ*, Arm. *bok* 'barefoot'
g. Toch. B *ścirye*, Hitt. *hastēr*-, Lat. *stēlla*, NHG *Stern* 'star'
h. Hitt. *sīu̯attas* 'day' (gen.sg.), Skt. *dyút*- 'splendour'
i. OLat. *ioubēre* 'to order', Lith. *judéti* 'to move', Skt. *yudh*- 'to fight'

11.3.2   Palatals, velars and labiovelars

The first three rows in the table show a sibilant (*s*-sound) reflex in some languages (Indo-Iranian, Balto-Slavic, Armenian, also indirectly in Albanian) but a velar in another group of languages. We call the languages with a sibilant (or its reflex, like Alb. *th*) the **satem** languages from the Avestan word *satəm* 'hundred'. The languages where we find a velar are called **centum** languages. Because these stops apparently were easily sibilated (without being influenced by adjacent sounds), it is assumed that they were once palato-velars: *k*-like sounds pronounced with the tongue raised more toward the center of the palate.

The correspondences in the last of the three groups in the table display a velar with a labial articulation (with rounded lips, as in Lat. *qu*, Goth. *hw* = [x^w]) in some of the centum languages. These sounds have sometimes developed into labials (*p*, *b*, etc. — as well as into dentals in Greek). In the satem languages we find the normal velars (*k*, *g*), which could become palatalized under the influence of following vowels. The labial articulation must have been original, for which reason PIE *k^w, *g^w, *g^{wh} have been reconstructed. These consonants are called labiovelars.

A third group of forms displays a velar in both the satem and the centum languages. Since this is a separate correspondence, one would need to postulate the existence of a separate, third series of phonemes. This is indeed what used to be done in IE linguistics. These sounds are often referred to as 'pure' (that is, non-palatal and unlabialized) velars: *k, *g, *g^h.

PIE	Skt.	Av.	OCS	Lith.	Arm.	Alb.	Toch.	Hitt.	Gr.	Lat.	OIr.	Goth.
*ḱ	ś	s	s	š	s	th, k[5]	k, ś[7]	k, kk[8]	k	c	c	h, g[13]
*ǵ	j	z	z	ž	c	dh, g[5]	k, ś[7]	k	g	g	g	k
*ǵʰ	h	z	z	ž	j, z[3]	d-, dh	k, ś[7]	k	kh	h, g[10]	g	g
*k												
*g		as below							as above			
*gʰ												
*kʷ	k, c[1]	k, c[1]	k, č, c[2]	k	k'	k, s, q[6]	k, ś[7]	ku, kku[8]	p, t, k[9]	qu, c[11]	c[12]	hw
*gʷ	g, j[1]	g, j[1]	g, ž, dz[2]	g	k	g, z, gj[6]	k, ś[7]	ku	b, d, g[9]	gu, g, v[11]	b	q
*gʷʰ	gh, h[1]	g, j[1]	g, ž, dz[2]	g	g, j[4]	g, z, gj[6]	k, ś[7]	ku	ph, th, kh[9]	gu, g, v, f-[11]	g	g, gw, w[14]

1. *c* [tš], *j* [dž], *h*, before PIE *e*, *ē*, *i*, *i̯*.
2. *č*, *ž*, before PIE *e*, *ē*, *i*, *i̯*; *c* [ts], (*d*)*z* before *ě* < **oi* (and after *ь*, *i*, *ę* < *i*, *iH*, *iN*).
3. *j* = [dz]; *z* between vowels.
4. *ǰ* before PIE *e*, *ē*, *i*, *i̯*.
5. *k*, *g* before resonant.
6. *s*, *z* before front vowels; *q*, *gj* secondarily before front vowels.
7. *ś* before PIE *e*, *ē*, *i*.
8. *k*-, *ku*- word-initially, -*kk*-, -*kku*- between vowels.
9. *k*, *g*, *kh* before and after *u*, before *i̯*; *t*, *d*, *th* before *e* and *i* (Aeol. only before *i*); *p*, *b*, *ph* elsewhere.
10. *h* in anlaut (word-initial) and between vowels, elsewhere *g*.
11. *c*, *g*, before *u*, *o* or consonant; *gu* after *n*; *f* in anlaut.
12. in Ogam still *q* = [*kʷ*]; in British *p*.
13. *h* in anlaut and directly after the PIE accent.
14. not completely clear: *gw* after *n*; *g* before *u*, *o*, *C*?

PIE **(d)ḱmtóm* 'hundred': Skt. *śatám*, Av. *satəm*, OCS *sъto*, Lith. *šim̃tas*, Gr. *hekatón* (*he*- from **d*-), Lat. *centum*, Goth. *hund*.

PIE **ǵerh₂*- 'to be old': Skt. *járant*-, Av. *zauruuan*- 'old age' (the first -*u*- is secondary), OCS *zъrěti* 'to ripen', Gr. *gérōn* 'old man'.

PIE **ueǵʰ*- 'to carry, to ride': Skt. *váhati*, Av. *vazaiti*, OCS *vezǫ*, Lith. *vežù*, Gr. *ókhos* 'wagon', Lat. *vehō*, Goth. *ga-wigan* 'to move'.

PIE **kreuh₂*-, **kruh₂*- 'flesh, blood': Skt. *kravíṣ*, Av. *xrūra*- 'bloody', OCS *krъvь*, Lith. *kraũjas*, Gr. *kréas*, Lat. *cruor*, OE *hrēaw* 'raw'.

PIE **leuk*- 'light': Skt. *róka*-, Lith. *laũkas*, Gr. *leukós*, Lat. *lūx*, OE *lēoht*.

PIE **kʷoineh₂*- 'price': Av. *kaēnā* 'punishment', OCS *cěna*, Lith. *kainà*, Gr. *poinḗ* 'punishment' (from which Lat. *poena* and thence E. *pain*).

PIE *$g^{wh}en$-, $g^{wh}n$- 'slay, kill': Skt. *ghn-ánti* 'they kill', OCS *ženǫ* 'to pursue, hunt down', Lith. *genù* 'id.', Gr. *theínō*, Lat. *dē-fendō*.

Clusters of two dental stops

When two dental stops occurred one after the other (which could happen at a morpheme boundary), a sibilant was inserted between them in PIE. Thus, *-*tt*-, *-*dt*- yielded *-*tst*- and *-$d^{(h)}d^{(h)}$- yielded *-$d^{(h)}zd^{(h)}$-. The cluster is retained as such in Hittite; in other languages it is simplified to -*tt*- (Indo-Aryan), -*st*- (Iranian, Greek, Balto-Slavic) or -*ss*- (Italo-Celtic, Germanic).

PIE *$h_1éd$-*t(o)* 'he ate' > Hitt. *ezzasta* /edsta/, *h_1ed-*ti*- > Lith. *ésti* 'to eat'
PIE *$uoid$-*th$_2$e* 'you know' > Skt. *véttha*, Gr. *oĩstha*
PIE *uid-*to*- 'known' > Av. *vista*- 'found', Goth. *wissa* 'knew', OIr. -*fess*

Exercise 2

Reconstruct the PIE obstruent from which the bold-face consonant is derived:

a.   Gr. *érebos*, Goth. *riqis*, Skt. *rájas*- 'darkness'
b.   Lat. *fugere*, Gr. *pheúgō* 'to flee', Skt. *pari-bhuját* 'encloses'
c.   Toch. B *yakwe*, Goth. *aihwa*-, Skt. *áśva*- 'horse'
d.   Lat. *angi-portus* 'dead-end side road', Goth. *aggwus* (*gg* = [ŋg]) 'narrow', Skt. *aṃhú*-
e.   Skt. *páśu*, Lat. *pecu* 'cattle'
f.   Skt. *gáti*- 'moving', Goth. *qumþs* 'arrival'
g.   Skt. *dih*- 'to smear', Lat. *fingo* 'to knead', Goth. *digands* 'kneading'.
h.   Skt. *cára*-, Gr. *pélomai* 'to roam'

11.3.3   The three velar series

The reconstruction of three velar series is one of the most debated issues in PIE phonology. For a number of reasons scholars came to believe that there could not have been any such third velar series. The first reason is that none of the known languages has three series. Some believe that all of the three series are represented in Albanian, but this is disputed by others. The Albanian material is limited, and the language in general presents many problems when it comes to historical interpretation. Suffice it to say that the presence of the three series in Albanian still remains to be proved.

The second, and more important reason to doubt the existence of a third series of phonemes is that these 'pure' velars are only found in certain positions, namely where one or both of the other series are not found. There seems to be a complementary distribution with (one or both of) the other series. This would mean that the sounds in question were not independent phonemes, but allophones of the other two series. Much has been written on this subject, and as yet there is no single theory which has

met with general acceptance. One of the subject's earliest treatments, that of Meillet dating from 1894, still remains the best.

It has been noticed that the plain velars (*K*) are often found after PIE **s*, and moreover that there are no indications for the existence of either **sḱ* or **skʷ*. For example: Lith. *skìrti* 'to divide', OHG *sceran* 'to cut, shave'; cf. Gr. *keírō*. This probably means that **ḱ* and **kʷ* after **s* lost their distinctive features and merged into **k*. A further peculiarity which is of importance here is that PIE had many words which either began or did not begin with *s-*, the so-called *s*-mobile (cf. Gr. *(s)kedánnūmi* 'to scatter'). In the case of such an alternation the *s*-less variants sometimes display a reflex of the original palato-velar (cf. Skt. *śúpti-* 'shoulder', MLG *schuft* 'withers' < **(s)ḱupt-*). Usually, however, these forms have *k*, for example Russ. *kora*, Lith. *karnà* 'bark', which are connected with the above-mentioned Lith. *skìrti*. Apparently, the indistinct form which was found after *s* was often generalized. It is now possible to assume that some forms with *K* had an *s*-mobile, also in cases where the *s-* cannot be demonstrated. Of course, proof cannot be forthcoming in such cases.

K is also frequently found after *u*: **leuk-*, see above; **iugom* 'yoke' (Skt. *yugám*, OCS *igo*, Gr. *zugón*, Lat. *iugum*, Goth. *juk*); PIE **h₂eug-* 'to increase, to multiply'. This renders it likely that both **ḱ* and **kʷ* became **k* after **u*.

Thirdly, we often find the *k*-sounds immediately before *r*, for example Skt. *kravíṣ*, see above.

We also find the normal velars before other resonants, but only in Balto-Slavic and Albanian. Here we also find alternations, for example OCS *slovo* 'word' < **ḱleu-os* (Gr. *kléos*, Skt. *śrávas*) as against Lith. *klausýti* 'to hear' < **klou-*. The existing alternations between BSl. *s* and *k* from a single root point to the fact that a palatal in certain positions lost its palatal character (became depalatalized), while in other positions this was not the case. The presence of palatal and depalatalized variants within one and the same word was mainly caused by the Indo-European ablaut: when a root displayed the structure *Cen-* and *Cn-*, depalatalization took place in the second but not in the first variant. Balto-Slavic probably had depalatalization before *m* and *n*, but before *l* and *u̯* only when there was no front vowel following (hence *klausýti* < **klou-*, but *slovo* < **ḱleu-*).

It is to be expected that such alternations could lead to the generalization of one of the original variants. Thus, OCS *srъdьce* 'heart' < **ḱrd-* would have gotten its *s* (we would expect *k* before *r*) from the nominative **ḱērd* (OPr. *seyr*, Arm. *sirt*, Gr. *kēr*). It is obvious, supposing this to be true, that proof is often impossible to provide due to later paradigm leveling. The rules in question are moreover very sensitive ones: it seems that vocalic **r*, **l*, **n* had a depalatalizing effect (cf. *srъdьce* above), but that **m̥* did not (OCS *sъto*, Lith. *šim̃tas* < **(d)ḱmtom*).

Depalatalization is also thought to have occurred before laryngeals (at least before **h₂*) already in PIE, cf. Skt. *khidáti*, Lat. *caedō* < **kh₂(e)id-*.

If these rules are correct and originally covered all cases, the normal velars are actually variants, allophones of both the two other series, and not independent phonemes of their own.

Not all problems have been solved, though. Before *r* Sanskrit, for example, has *śrī-*, Av. *srī* 'beauty' (which has been connected with Gr. *kreíōn* 'ruler') and *śmāśru-* 'beard' (Lith. *smākras*), with inexplicable -*śr-*. There is also Skt. *ruśant-* 'clear, radiant' with *ś < *ḱ* after *u*, for which no explanation seems possible. Lith. *šlaunìs* 'shinbone' (Skt. *śróṇi-*) from **ḱlou-* (to which OHG *hlaun* also points) contradicts the Balto-Slavic rule of depalatalization.

The roots **h₁ger-* 'to awaken' and **kes-* 'to comb', which are often used as counter-arguments, are thought to have gotten their *K* from the zero-grade forms **h₁gr-* and **ks-*, where depalatalization would be regular. No explanation seems possible for the root **kei-*, enlarged as **kieu-* 'to set into motion or to be in motion' (Skt. *cyávate*, Av. *šiiauuaitē < *cy-*), unless we invoke the help of the *s*-mobile, of which no trace can be found.

One may ask whether it is likely that a system with so many rules (depalatalization after *s*, *u*; before *r*, laryngeal) would not quickly lead to phonemicization of the pure velars, especially in the case of the second rule (before *r*, etc.), because of paradigmatic alternation. And if the allophony remained intact, it is hardly credible that the depalatalized sound would be generalized in the many verbal roots ending in **-g*, **-gʰ* such as **(s)teg-* 'to cover', **steigʰ-* 'to step'.

To conclude, it is possible or perhaps even probable that the normal velars came into being in the manner just described. Perhaps there are more factors which played a role in this process than has been realized up till now. It seems likely that the third series was phonologized already in the proto-language. Its later merger with one of the two other series is not a problem in itself. The only reason for doubt is the fact that *nowhere* has a third series actually been preserved.

11.3.4   Centum and satem languages

It was formerly held that the division into centum and satem languages should be seen as a split within Indo-European into a western and an eastern group. After the discovery of Hittite, and especially of Tocharian, a centum language in the farthest east, the whole idea of a west-east division collapsed.

An essential question is whether the satem languages have developments in common other than the tendency to assibilate the palatals (the centum languages have nothing further in common). The only thing that can be named is the special development of **s* after *i*, *u*, *r*, and *k* (Skt. *ṣ*, etc., see Section 11.5). The fact that these languages, which bordered each other, all have an exceptional development of **s* in exactly the

same circumstances, cannot be coincidental. It must have been a purely phonetic development, because the different reflexes of *s only become phonologized much later.

What the centum and the satem languages, respectively, have in common must be described more precisely. The PIE distinction $\acute{k} : k^w$ is doubly marked, since an opposition $k : k^w$ or $\acute{k} : k$ would provide sufficient characterization. Hence it is not surprising that one of the two series lost its distinctive feature. The system of $k : k^w$ came into being in the centum languages. In the satem languages $\acute{k}$ became further palatalized or assibilated (for example, to c); since the palatal series thus became clearly marked, the labiovelar could easily lose its labial element. The labiovelar was preserved until the individual languages, as appears, among other things, from the fact that $r̥$ became *ur* after a labiovelar (otherwise > *ir*) in Balto-Slavic.

11.3.5 The voiceless aspirates

It was formerly assumed that PIE also had voiceless aspirates (tenues aspiratae) (p^h, t^h, $\acute{k}^h$, etc.). This was especially based on the fact that Sanskrit has a row of voiceless aspirate phonemes *ph*, etc. in addition to *p b bh*, etc. Sometimes a Greek word with *ph* seemed to be cognate with a Skt. word with *ph*, as did some Armenian words with *p'*, *t'* (although PIE *t also gave *t'*), *x*, and Slavic words (only) with *x*, although these correspondences were irregular.

Skt.	Av.	Arm.	Slav.	Lith.	Gr.
ph	*f*	*p'*	(*p*)	(*p*)	(*p*), *ph*
th	*ϑ*	(*t'*)	(*t*)	(*t*)	(*t*), *th*
kh	*x*	*x*	*x*	(*k*)	(*k*), *kh*

Yet these correspondences were only found in a few words. Also, the number of cases with (supposed) *t^h was much greater than all of the others taken together. After the discovery of the laryngeals, it appeared that the Sanskrit forms with *th*, etc., for the most part reflect a voiceless consonant + laryngeal. For example:

Skt. *tíṣṭhati* 'to set' < *ti-sth_2-e-ti, where the laryngeal is shown by the root *$st\bar{a}$- = *$steh_2$-
Skt. *pr̥thú-* 'broad' (Gr. *platús*) < *$plth_2u$-, as appears from fem. *pr̥thivī́* (with -*i*- < *h_2) and the Greek place-name *Plataiaí* (fem. pl.) from *$platau̯ia$ < *$plth_2$-u-ih_2.

Note that Greek did not develop aspiration from *th_2.

Perhaps k + laryngeal gave *x* in Slavic:
Russ. *soxá* '(wooden) plow', Lith. *šakà*, Skt. *śā́khā* 'branch', Goth. *hoha* 'plow' < *$\acute{k}o/\bar{o}k$-H-?

In many cases the alleged tenuis aspirata follows *s*. A number of these cases are probably explained by an *s*-mobile, whereby voiced aspirates such as *$*b^h$* became voiceless (Siebs' law):

> Skt. *skhálati* 'to stumble', Arm. *sxalem* 'to wander away', Gr. *sphállō* as opposed to Lat. *fallō* < *$*(s)g^{wh}$*-.

A number of words with a voiceless aspirate have an expressive character:

> Skt. *kákhati* 'to laugh', Gr. *kakházō*, Arm. *xaxankʿ*, OCS *xoxotъ*.

The number of cases which remains after the preceding ones have been explained away provides too small a basis for supporting the reconstruction of a series of PIE phonemes.

11.3.6   The glottalized consonants

When it became clear that PIE did not have voiceless aspirates, what remained from the system $p\ p^h\ b\ b^h$ was the series $p\ b\ b^h$. As against the latter system it was argued that it is hardly found in any known language. One finds systems with p^h instead of b^h, or with b^h and p^h together. The reason is that $p\ b\ p^h$ displays fewer distinctive features: p and b differ as – and + voice, p and p^h as – and + aspiration. In the traditional reconstructed system of PIE the b^h is characterized by aspiration as well as by voice. For this reason — and for other reasons as well, not all of which appear to be correct — it was proposed in the 1970s by Gamkrelidze and Ivanov as well as by Hopper, that b was actually a glottalized consonant in PIE, *p'* (that is, *p* pronounced with a glottal stop, such as one hears in E. *all*, *open* before *a*-, *o*-). Such sounds are not infrequently found in the world's languages. One finds them, for example, in the Caucasian languages. On this assumption, the whole system has been reformulated in different ways by different scholars. It is simplest to assume the existence of the system *p: p' p*. Probably the first stop was 'fortis' (it had a longer duration) whereas the last two were 'lenis'; the second stop was characterized by glottalization. Note that in this interpretation, voice is no longer a distinctive feature of PIE. In order to avoid misunderstandings, however, we will continue writing $p\ b\ b^h$ in PIE reconstructions.

There are now a number of different but concrete indications that this theory is correct. Important is that the glottalic feature probably *preceded* the consonant: it was pre-glottalized, *'p*, etc. Understood in this way, Lachmann's law for Latin can be explained (see also Section 5.6). This law states that a PIE voiced (non-aspirated) stop *b d g gʷ* before a consonant lengthened a preceding vowel, for example: *ag-ō* : *āc-tus* (with *$*ǵ$*), but *veh-ō* : *věc-tus* (with *$*ǵ^h$*). The solution is that the glottal stop (ʔ) of the *g* = *'k* lengthens the preceding vowel: *aʔg-tos* > *āctus*. The glottal stop, then, has the same lengthening effect as a laryngeal, cf. *$eh_2C > āC$*.

Another very important aspect is that the theory also explains why in Balto-Slavic a preceding vowel is lengthened by a voiced (non-aspirated) stop (Winter's law): Skt. *ád-mi*, Lat. *ed-ō* 'to eat' have short *a* and *e*, whereas Lith. *ė́sti* (< **e'd-ti*) has a long vowel *ė*. The explanation for this lengthening is identical to that of Lachmann's law. To this we must add that this lengthened vowel always has an acute accent — this point was stressed by Kortlandt. And we now know that the acute accent of Balto-Slavic is elsewhere caused by a laryngeal. Here, too, glottalization has the same effect as a laryngeal. (Wherever a sonant was found in between, we do not find lengthening, but we do find an acute accent: Lith. *mélžiu* 'to milk', Gr. *amélgō*, PIE **h₂melǵ-*.) It is now possible to make out whether a BSl. *g* goes back to an aspirated or to a non-aspirated sound.

The theory is thus provable in a concrete sense, and it removes a typological objection against the older reconstruction of the PIE stops.

11.3.7 Grassmann's and Bartholomae's Laws

Grassmann's Law states that an aspirated sound loses its aspiration when it is followed by another aspirated sound: two aspirated sounds in one form, then, could not be found together. In Sanskrit, for example, *dh – dh* became *d – dh*:

> *da-dhā́-ti* 'to set', reduplicated present
> pres. *bódh-a-ti* 'to be awake, observe' from **bʰeudʰ-*, cf. Gothic *faur-biudan* 'to forbid'.

When the second aspirate had lost its aspiration before final *s* or *t*, the first aspirate was retained:

> *dáh-a-ti* 'burn', from **dhagh-*, but 3 sg. s-aor. *á-dhāk* < **-dhāk-s-t*

In Greek the same dissimilation occurred, but only after the aspirates had become voiceless. The resulting de-aspirated sound is therefore voiceless, e.g. *dʰ-dʰ* > *tʰ- tʰ* > *t – th*:

> *tí-thē-mi* 'to put' from **dʰi-dʰeh₁-*
> *peúth-o-mai* 'to hear, to be informed', cf. Skt. *bódhati* above.

In Greek *h-* < *s-* is also lost:

> *ékh-ō* 'to have' from **hekh-* < **segʰ-*, but fut. *hék-s-ō*

In Greek, too, the aspirate remains when the second aspirate loses its aspiration, hence:

> gen. sg. *trikh-ós* 'hair', but nom. *thríks*

Note that the Indo-Iranian and Greek rules operated in the two languages independently.

Bartholomae's Law states that a group of an aspirate + voiceless stop became a voiced (non-aspirated) + voiced aspirated stop in Indo-Iranian, e.g.:

> Skt. *druh-* 'to deceive', verbal adjective *drugdhá-* < *$drug^h$-tó-*
> OAv. *aogə-dā* 'he said' from *aug^h-ta* > *$augd^{(h)}a$* (Iranian has lost the aspiration, but voiced *-gd-* can only be explained in this way). In Young Avestan *-ta* was restored, which gave *aoxta* < *$aukta$.
> OAv. 2 sg. *-aoɣ-žā* shows the same process before *s*: *aug^h-sa* > *$aug\check{z}^h a$* > *$aug\check{z}a$*.

It has been suggested that the process dates from PIE. Mostly the effects would have been removed by analogy, as in the case of YAv. *aoxta*. But the evidence in favour of a PIE date is not very convincing. Worth considering, however, is the explanation of suffix variants like *-tro-*/*-d^hro-* etc. (e.g. OIr. *críathar*, Lat. *crībrum* 'sieve' from *$krei$-tro-* and *$krei$-d^hro-*, respectively): *-d^h-* would have arisen from *-t-* after an aspirate (note that there is no variant *-dro-*).

It is remarkable that Bartholomae's Law shows progressive assimilation of voice: elsewhere we mostly find regressive assimilation. This conclusion can be avoided if we assume that the process essentially consisted of the realization of the aspiration at the end of a cluster ($T^hT > TT^h$), as is phonetically understandable.

Exercise 3
Reconstruct the PIE obstruents from which the bold-face consonants are derived:

a.   Skt. *yod**dh**ár-* 'fighter'; compare Skt. ***dh**ātár-* 'creator' to *dhā-* 'make, create'
b.   Skt. *b̥h-ánt-* 'high', Hitt. ***p**ark-u-*, Arm. ***b**arj-r*
c.   Gr. *toī**kh**os* 'wall', Arm. *d**ēz*** 'pile', Goth. *dai**gs*** 'dough'
d.   Av. *ba**zd**a-*, Skt. *ba**ddh**á-* 'bound'; cf. Skt. *badh-* 'to bind'
e.   Skt. *dó**gdh**i* 'he milks' (< *-ti), Goth. *dau**g*** 'to be good, fit'

11.3.8   The Germanic and the High German sound shifts

Grimm's Law
In Germanic all PIE stops are "shifted" according to the following scheme:

PIE	>			PGm.				Armenian			
p	*t*	*ḱ*	*kʷ*	*f*	*þ*	*χ*	*χʷ*	*h*	*tʻ*	*s*	*kʻ*
b	*d*	*ǵ*	*gʷ*	*p*	*t*	*k*	*kʷ*	*p*	*t*	*c*	*k*
bʰ	*dʰ*	*ǵʰ*	*gʷʰ*	*b*	*d*	*g*	*gʷ*?	*b*	*d*	*j*	*g*

The voiceless stops have become spirants, the voiced stops have become voiceless, and the aspirated sounds have lost their aspiration. The stops *p *t *k remain unchanged

after *s* and *f*, *þ*, *χ*. This complex of shifts is called Grimm's Law after its first description by Jacob Grimm (in 1822).

Note that a similar type of shift is found in Armenian, where *p became *h* or zero (in anlaut) via **p'*. The first row of stops was aspirated (*t'*), the second row glottalized (*t*), the third row voiced.

Verner's Law

Many Germanic words have reflexes of PIE *p, *t, *ḱ, *kʷ which are voiced stops or spirants (*b/ƀ*, *d/đ*, *g/g*, *gʷ/gʷ*) instead of the voiceless spirants (*f*, *þ*, *χ*, *χʷ*) which we would expect from Grimm's Law. Similarly many Gm. words have *z (which became *r* in all languages but Gothic) for PIE *s. Thus we find Goth. *broþar* 'brother' < *bʰreh₂tēr, but *fadar* (*d = đ*) < *ph₂tēr. The Danish scholar, Karl Verner, discovered the solution for this difference when he compared the accentuation of Skt. *bhrā́tā* and *pitā́:* when the preceding vowel had the PIE accent, Germanic preserved the voiceless obstruent. It also did so if the obstruent was in word-initial position. Conversely, if a different syllable was stressed, the voiceless spirants yield voiced reflexes.

Another trace of the accent rule is provided by the preterite of strong verbs. In PIE the root of the perfect had the accent in the singular (Skt. *véda*), whereas the ending was accented in the plural (Skt. *vidmá*). This difference can be found back in the Germanic preterit, for example OHG sg. *kōs* : pl. *kurum*, OE *cēas* : pl. *curon* < Gm. *kaus : *kuzume < PIE sg. *ǵóus-e : pl. *ǵus-mé. English later generalized the *-s-* in *chose*. Original *r* < *z remains only in *was* : *were*.

Here are some more examples of the operation of Verner's Law:

> *pórḱos 'pig': Lat. *porcus*, Lith. *par̃šas*, OHG *far(a)h*, OE *fearh*
> **poḱró-* 'fitting, fair': Goth. *fagrs*, OS OHG *fagar*, OE *fægr*, MoE *fair*
> *snusós 'daughter-in-law': Skt. *snuṣā́*, Gr. *nuós*, Lat. *nurus*, OIc. *snor*, OHG *snur(a)*, OE *snoru*.
> **uérte/o-* 'to turn': Skt. *vártate*, Goth. *wairþan*, OFr. *wertha*, OHG *werden* 'to become'
> **uortéie-* 'to make turn': Goth. *fra-wardjan* 'to destroy' (*fra-wairþan* 'to perish')

Exercise 4

Reconstruct the PIE obstruents found in the stem of the following cognate Gothic word pairs. Also indicate for each form which syllable was originally stressed:

a.   ***filh****an* 'to hide', ***fulg****ins* 'hidden'
b.   ***aih*** 'I possess', ***aig****um* 'we possess'
c.   ***sand****jan* 'to send', ***sinþs*** 'road'
d.   *af-**lif***nan* 'to remain', *bi-**laib***jan* 'to leave'
e.   ***wiz****on* 'to wallow', ***wis****an* 'to gorge'
f.   *ana-**mind***eis* 'suspicions', *ga-**minþi*** 'recollection'

Exercise 5

Reconstruct the PIE obstruents from which the bold-face consonants are derived:

a.   Goth. *tun**þ**us*, Skt. *d**á**nt-*, Gr. *o**d**ónt-* 'tooth'
b.   Gr. *mé**th**u*, English *mea**d***
c.   Arm. *o**t**n*, English *foo**t***
d.   Av. *ma**zg**a-*, Dutch *mer**g*** 'marrow'
e.   Arm. *ta**s**n*, Gr. *dé**k**a* 'ten'
f.   Goth. *q**ino*, OCS *ž**ena* 'woman'

Now additionally indicate which syllable bore the accent in PIE: the root or the suffix.

g.   Lat. *c**entum* 'hundred', Goth. *h**unda* 'hundreds'
h.   OS *b**ar*, English *b**are* 'naked', Lith. *b**āsas* 'barefoot'
i.   Goth. *si**b**un*, Av. *ha**p**ta*, Lat. *se**pt**em* 'seven'

Interpretation

By means of Verner's Law, the newly voiced obstruents merged with the reflexes of PIE *bʰ, *dʰ, *gʰ. It is disputed whether we must reconstruct PGm. voiced stops (*b) or fricatives (**b̄*) as their phonetic realization. Some languages point to original stops (Scandinavian, English, High German), others often have fricatives (Low German, Dutch), whereas Gothic shows a complementary distribution of both. Some of the handbooks posit PGm. fricatives which returned to being stops in many dialects. Thus, a word like PIE 'father' would have developed *t > *þ (Grimm) > *đ (Verner) > *d* (Goth. *fadar*, OE *fæder*; > *t* in G. *Vater*). Yet the evidence for a fricative pronunciation is in general more recent than for voiced stops. It is methodologically more sound to assume PGm. voiced stops *b etc. as the oldest variants. This also renders their merger with *bʰ > *b more straightforward. As a result we must rephrase Verner's Law as:

PIE *p, *t, **k⁽ʷ⁾*, *s   > PGm. *b, *d, **g⁽ʷ⁾*, *z before the accent

This change can no longer be dated after Grimm's Law (since *p would have become *f, etc.), but must have preceded it, as proposed by Theo Vennemann in 1984.

Kluge's Law

PIE stops of all three types (*t, *d, *d^h) are geminated by assimilation to a following *n if the accent followed, but not if the accent was on the preceding syllable. The geminate always shows up as voiceless in Germanic. After a long vowel or a diphthong, the geminate was shortened at a later stage, as in the first of the following three examples (*tt > t):

PIE *t   Goth. *hweits*, E. *white*   < PGm. *hwīta- < *hwītta- < *ḱweit-nó- (Skt. *śvetá-*, *śvítna-* 'white')

PIE *d   MHG *stutzen* 'to bump' < PGm. *stuttōn- < *(s)tud-néh₂- (Lat. *tundō*, Skt. *tudáti* 'to thrust')

PIE *d^h OE *botm*, MoE *bottom* < PGm. *buttma-. Leveled from a paradigm nom. *budmēn, gen. *buttaz < nom. *bʰudʰ-mḗn, *bʰudʰ-(m)n-ós (Skt. *budhná-*, Gr. *puthmḗn* 'bottom'; in the gen. *dʰmn was simplified to *dʰn before Kluge's Law)

This explanation for the geminate stops of Germanic was first given by Friedrich Kluge in 1884. Its regularity has often been doubted (some have called this gemination 'expressive', meaning 'not governed by sound-law') but it is now clear that Kluge was basically right. The subsequent reduction to single stops after long vowels and diphthongs explains why we sometimes find PIE *p, *t, *k reflected as p, t, k which did not undergo Grimm's Law, as in E. *white* < *-tt- < PIE *-t-n-.

Exercise 6

Reconstruct the PIE obstruents from which the bold-face consonants are derived, and determine whether (in Germanic) the root or the suffix bore the accent:

a.   Olc. *sve**f**n*, Lat. *somnus* (< *swe**p**nos) 'sleep'
b.   OE *li**cc**ian*, Du. *li**kk**en* 'to li**ck**', Gr. *li**kh**neúō*, Lat. *lin**g**ō* (< *li**g**-n-)
c.   OE *clāte* 'clot-bur' (a plant) (< *klait-), Lat. *glūten* 'glue' (< *gloit-n-)
d.   Goth. *a**þ**n(s)* 'year' (< *a**þ**na-), Lat. *annus* (< *atno-)
e.   Goth. *diups*, E. *deep* (< *deupa-), CS *dъno* 'bottom' (< *-bʰno-), OIr. *domain* 'deep' (< *-bʰni-)

Relative chronology

The reinterpretation of Verner's Law as *t > *d and the identical result which *t and *d^h yield by Kluge's gemination both imply that the traditional order of 1. Grimm, 2. Verner, must be changed to: 1. Verner, 2. Kluge, 3. Grimm. The main objection that

has been raised against this assumption is that the voiced stops resulting from Verner (*p > *b, etc.) would have merged with plain PIE *b, *d, etc., which is clearly not the case (compare E. *father* < *t against *water* < *d). Yet there is evidence which suggests that the 'plain' voiced stops were phonetically something different. It has already been proposed on various independent grounds that PIE *b, *d etc. were (pre)glottalized in PIE (see Section 11.3.6). An additional indication for original glottalization within Germanic is the preglottalization, preaspiration and gemination which PIE *b, *d, *g display in many Germanic languages and dialects. Traditional *bʰ, *dʰ etc. can be reinterpreted as simple voiced stops or lenis stops, see 11.3.6. above.

Here is a short overview of our new interpretation of the Proto-Germanic changes:

1. Pre-Germanic: *t, *'d, *d
2. Verner's Law: *t > *t and *d   (no change in the system)
3. Kluge's Law: *tn, *'dn, *dn > *tt (system: *t, *tt, *'d, *d)
4. Grimm's Law: *t *'d *d > *þ *'t *t (system: *þ, *tt, *'t, *t)
    (but *d remained in Gothic; a voicing distinction was also restored in many later Gm. dialects, e.g. in Dutch, probably under the influence of neighbouring languages)

More geminates such as *þþ and *'tt arose through later developments, especially in West Germanic.

Note that the same alternative PIE system (*t, *'d, *d instead of traditional *t, *d, *dʰ) also renders the Armenian sound shift (> *tʰ, *'t, *d) less spectacular.

The High German Sound Shift

Between the fourth and the eighth centuries another shift took place in the High German dialects:

PGm.	OHG	OHG between vowels	PGm.	OHG	PGm.	OHG
*p >	pf	ff	*b >	p		
*t >	z [ts]	zz	*d >	t	*þ >	d
*k >	kch	hh,ch	*g >	k		

Du. *werpen* 'to throw', OHG *werpfan*
OS *opan* 'open', OHG *offan*
Goth. *taihun* 'ten', OHG *zehan* (PGm. *teχun < PIE *déḱm)
Goth. *itan* 'to eat', OHG *ezzan* (PGm. *etanan < PIE *h₁ed-)
Goth. *dauhtar* 'daughter', OHG *tohter* (PGm. *duχter- < PIE *dʰugh₂ter-)
Goth. *broþar*, OHG *bruoder* 'brother'

The results of all these shifts differ widely depending on the dialect. Affrication is found most consistently in the southernmost areas (Switzerland, Tyrol) including *k* > *kch*. Modern standard German combines forms from different dialects. Note that intervocalic *zz* has become *ss* in NHG (*essen* 'eat'), and syllable-final *pf* and *z* have also been simplified (NHG *werfen* 'throw', OHG *iz*, NHG *es* 'it').

The scheme as given above is the traditional formulation of the HG sound shift. If one adopts the reinterpretation of the sound shifts as given in the preceding paragraph, the HG changes can be rephrased as **'t* > *z/zz* (that is, preglottalized stops became affricates) and *t > *t* (no change). The change of *þ > *d* is not really part of the High German sound shift; it is also found in Low German and Dutch.

Exercise 7

Describe the development of the bold-faced PIE obstruents between PIE and NHG or English. If needed you may compare Chapter 11.10.

a. **lē**d**onom*   > NHG *lassen*, E. *let*
b. ***t**o**d*   > NHG *das*, E. **that**
c. **lip-éh₁-*   > NHG *le**b**en*, E. *li**v**e*
d. **ǵenh₁**t**ís*   > NHG **K**ind (Swiss dial. **Kch**ind)
e. **dnǵʰu-*   > NHG *Zunge*, E. *tongue*
f. **ḱh₂**s**-én-*   > E. *hare*

Exercise 8

Reconstruct the PIE stops to which the bold-faced consonants go back :

a. NHG *hel**f**en*, E. *hel**p***
b. NHG ***Z**ahl* 'number', E. ***t**ale*
c. NHG ***St**orch*, E. *s**t**ork*
d. NHG *s**t**ossen*, Goth. *s**t**autan* 'to thrust'
e. OHG *zī**h**an* 'to accuse'

11.3.9 Skt. *kṣ* — Gr. *kt* etc.

Some correspondences between consonant clusters in the IE languages do not seem explicable in terms of the combinations of the known consonants, e.g. Skt. *kṣ* — Gr. *kt*. PIE *ks would give Gr. *ks*, and PIE *ḱt would normally yield Skt. *ṣṭ*. The correspondences are:

Skt.	Av.	Gr.	PIE
kṣ	*xš*	*kt*	*-k-*
kṣ	*š*	*kt*	*-ḱ-*
kṣ	*z*	*khth*	*-ǵʰ-*
kṣ	*(d)j /_i*	*phth*	*-gʷʰ-*

(PIE *-k-* here means 'a consonant cluster with PIE *k*')

This problem has proven very exciting, because it involves a number of very old words:

> Skt. *tákṣan-* 'carpenter', Av. *tašan-*, Gr. *téktōn* (Lat. *texō* 'to weave', OHG *dehsala* 'cover')
>
> Skt. *kṣam-* 'earth', Av. *zam-*, OCS *zemlja*, Lith. *žḗmė*, Alb. *dhe*, Hitt. *tēkan*, Gr. *khthṓn*, Lat. *humus*, OIr. *dú*; cf. Lat. *homō* 'human being', Goth. *guma* (E. *bride-groom* has its second part changed after *groom*, cf. Du. *bruidegom*).
>
> Skt. *ṛ́kṣa-* 'bear', Av. *arəša-*, Hitt. *hartagga-*, Gr. *árktos*, Lat. *ursus*, Arm. *arǰ* (< *arj* + *-io-*)
>
> Skt. *kṣiṇóti* 'to destroy, to decay', Gr. *phthī́nō*, cf. Skt. *śrávas ákṣitam*, Gr. *kléos áph-thiton* 'imperishable fame'

In order to explain these correspondences scholars have frequently assumed clusters which included a velar stop plus a dental fricative phoneme *þ*, which would have occurred only in these clusters. Yet it is improbable that a phoneme would only be found after velar stops.

   When Hittite was discovered, the word for 'earth' turned out to be *tēkan*, gen. *taknas*; this points in the direction of *dʰeǵʰ-/*dʰǵʰ-*. The original order, dental-velar, is also confirmed by Toch. A *tkaṃ* (Toch. B. *keṃ*). For 'bear' Hitt. *hartagga-* (a wild animal) points toward *h₂rtḱo-*. For Skt. *kṣi-* OAv. *dǝjīṯ.arǝta- /djitʔarta-/* 'destroying Arta' points toward *dʰgʷʰi-*. The consonant cluster was apparently simplified in a number of different ways. Thus, the Sanskrit genitive for 'earth' is *jmás*, Greek has *khamaí* 'on the earth'. Not all problematic correspondences have been solved yet.

Exercise 9

Reconstruct the PIE (cluster of) obstruents from which the bold-face consonants are derived:

a.   Skt. ***kṣ**éti*, OAv. ***š**aēitī* 'inhabits', Gr. ***kt**ízō* 'to found'

b.   Lat. ***pect**en* 'comb', Gr. ***kt**eís*, gen.sg. ***kt**enós*; compare Lit. ***p**e**š**ù* 'to pull out (hair)', Gr. ***p**ékō* 'to comb'

c.   Gr. ***phth**ánō* 'to be beforehand', Skt. ***dagh**yās* 'you may reach'

11.4   PIE *s

Skt	Av.	OCS	Lith.	Arm.	Alb.	Toch.	Hitt.	Gr.	Lat.	OIr.	Goth.
s^1	s, h^2	s^3	s^4	$s, h, \emptyset^5$	$sh, gj\text{-}^6$	s	s^7	$s, h, \emptyset^8$	s, r^9	s^{10}	s^{11}

1. *ṣ* after *i*, *u*, *r*, *k*.
2. *š* after *i*, *u*, *r*, *k*; *s* before stops.
3. *x* after *i*, *u*, *r*, *k* before vowels.
4. *š* after *i*, *u*, *r*, *k* (often *s* analogically restored).
5. *s* before stops; zero between vowels.
6. *sh* before consonant or unstressed vowel, *gj-* before stressed vowel.
7. *is-* in anlaut before a stop and *$\mathring{}h_2$.
8. *s* before and after a stop, and in auslaut; elsewhere *h* preserved in Mycenaean, in the other dialects only in anlaut (but not in Ionic and Aeolic); in many positions it was lost with compensatory lengthening of the preceding vowel.
9. *r* between vowels; many other rules.
10. *h* in British Celtic.
11. in anlaut and after the PIE stress; elsewhere *z* (Verner's law; see 11.3.8), which became *r* in the other Germanic languages.

> PIE **sed-* 'to sit': Skt. *sad-*, Av. *had-*, OCS *sěděti*, Lith. *sėdéti*, Gr. *hédos*, Lat. *sedeō*, Goth. *sitan*, E. *to sit*
>
> PIE **ues-* 'to clothe oneself': Skt. *váste*, Av. *vaste*, Arm. (*z-*)*gest* 'piece of clothing', Alb. *vesh*, Toch. A *wsāl*, Toch. B *wastsi* 'piece of clothing', Hitt. *wess-* 'to dress', Gr. *heîma* < **ues-mn*, Lat. *vestis* (E. *vest* is a loanword)
>
> PIE **bʰoso-* 'bare(footed)': OCS *bosъ*, Lith. *bāsas*, Arm. *bok* (<**bʰoso-go-*), OHG *bar*, OE *bær*
>
> PIE **-su* loc. pl. ending: Skt. *áśvā-su*, but *agní-ṣu*, *sūnú-ṣu*, *vák-ṣu*, *pitṛ̣-ṣu*; OCS *trь-xъ*, *synъ-xъ* (anal. *-a-xъ*); Alb. abl.pl. *-sh*.
>
> PIE **st(é)h₃-mn-* 'jaw': Hitt. *istāman-* 'ear', Gr. *stóma* 'mouth', W. *safn* 'underjaw' (< **stamn-*)

Rules 1–4 above are referred to as the **ruki-rule**. In 11.3.4 it was pointed out that this development (i.e., *s* > **š* after *i*, *u*, *r*, *k*) is common to the satem languages. It was originally only a phonetic change, which was phonologized later in the separate languages.

11.5   The sonants

The sonants have consonantal and vocalic allophones, which are often notated as *r*, *l*, *m*, *n*, *i̯*, *u̯* (consonantal) and *r̥*, *l̥*, *m̥*, *n̥*, *i*, *u* (vocalic), respectively.

11.5.1   *r, l, m, n, i, u* as consonants; Sievers' Law

r, l, m, n > *r, l, m, n*
  but *l* > IIr. *r*

r, l, m, n remain unchanged in all languages, but *l* becomes *r* in Indo-Iranian (in central Indian dialects *l* remained, whereas in eastern dialects *r* became *l*). In Albanian, intervocalic *n* has become *r* in the Tosk dialects but not in Gheg: T. *emër*, G. *emën* 'name'.

The development of *i̯* and *u̯* was as follows:

PIE	Skt.	Av.	OCS	Lith.	Arm.	Alb.	Toch.	Hitt.	Gr.	Lat.	OIr.	Goth.
i̯	*y*	*y*	*j*	*j*	Ø	*gj-*, Ø[2]	*y*	*y*[3]	*z, h*, Ø[4]	*i*, Ø[6]	Ø	*j*
u̯	*v*	*v*	*v*	*v*	*g, v*[1]	*v*	*w*	*w*	*w, h*, Ø[5]	*v*	*f, v*, Ø[7]	*w*

1. mostly *g* but *v* when word-final after apocope.
2. *gj-* in anlaut, Ø intervocalic.
3. zero in anlaut before *-e-.
4. *z* and *h* in anlaut before vowels (see text); zero between vowels; special developments. Myc. *j* or Ø.
5. *h* and zero in anlaut, *w* in dialects, Myc. *w*.
6. Ø between vowels.
7. *f-* in anlaut, Ø intervocalic; British *gw-*, *-w-*.

PIE *leig̑ʰ*- 'to lick': Skt. *réhmi*, OCS *lizati*, Lith. *liežiù*, Arm. *liz(an)em*, Gr. *leíkhō*, Lat. *lingō*, OIr. *ligim*, Goth. (*bi-*)*laigon*, OS *likkon* (< *ligʰ-n-*)
PIE *iekʷr* 'liver': Skt. *yákr̥-t*, Av. *yakarə*, Lith. *jēknos*, Gr. *hēpar*, Lat. *iecur*
PIE *ue/oik̑-*, *uik̑-* 'place of habitation': Skt. *víś-*, Av. *vīs*, OCS *vьsь*, Lith. *viēš-pats* 'lord of the house', Gr. *(w)oîkos*, Lat. *vīcus*

For Greek *z-* : *h-* see Section 11.8.2.

Sievers' Law
After a long vowel + consonant, or after a short vowel + two consonants, *y* is realized as vocalic *iy* in Sanskrit. For instance, the dat. pl. ending Skt. *-bhyas* in such cases must be read as *-bhias*. In Germanic, a very similar distribution of *j* and *ij* according to the weight of the preceding syllable occurs: Goth. *harjis* 'army' < *korio-* but

hairdeis 'herdsman' (with /ī/ < *-ija-) < *$kerd^hio$-. There are clear indications that a Sievers-governed distribution of *j was still productive after some earlier PGm. sound changes had already taken place: Runic *holtijaz* < *$hultjaz$ (heavy stem) < *$k̥ld$-io- (light stem). The similarity of Sanskrit and Gmc. might point to a PIE date for this distributional rule, but we find no confirmation in the other branches. In Greek, for instance, consonantal *$i̯$ is reflected in old, unproductive forms (e.g. *mésos* 'middle' < *med^hios, *óneiros* 'dream' < *$h_3nerios$), as against -*io*- in more recent formations.

A number of the exceptions, e.g. *-io*- after a short vowel + single consonant, can be explained by the suffix *-ih_2o- (probably an extension of the suffix *-ih_2- 'belonging to', see 13.2.6b and 13.2.9 on the Latin gen. -*ī*).

A very similar rule of PIE syllabification was proposed to operate in anlaut, that is, after an initial consonant, and only in monosyllables; this is referred to as **Lindeman's rule**. Thus, in the *Rigveda*, *Dyáus* must often be read *Diyáus*. Jochem Schindler has shown that this is in fact the same phenomenon as Sievers' Law, being conditioned by a preceding word which ended in a heavy syllable.

The evidence which has been put forward for the operation of Lindeman's Law outside Vedic can be explained differently. For instance, Gr. *kúōn* 'dog', rather than reflecting a Lindeman form *$ku(u̯)ōn$, is due to influence of the zero grade *ku*- in e.g. gen. *ku-n-$ós$; note that *$ku̯ōn$ would have given Gr. *(p)pōn* besides the gen. *kunós*. There is thus no compelling reason to assume a PIE date for the development found in Vedic.

11.5.2   *r, l, m, n, i, u* as vowels

i and *u* are preserved in this form everywhere, but

i	>	OCS	*ь*,	Toch.	*ä*
u	>		*ъ*,		*ä*

(*ь* and *ъ* as *i*, *u* in E. *pit*, *cut*)

The vocalic form of the other sonants developed as follows:

PIE	Skt.	Av.	OCS[3]	Lith.[4]	Arm.	Alb.	Toch.	Hitt.	Gr.	Lat.	OIr.	Goth.
r̥	*r̥*[1]	*ərə*[1]	*rь, rъ*	*ir̃, ur̃*	*ar*	*ri*	*är*[5]	*ar*	*ra*[6]	*or*	*ri*	*aur*[8]
l̥	*r̥*[1]	*ərə*[1]	*lь, lъ*	*il̃, ul̃*	*al*		*äl*[5]	*al*	*la*[6]	*ol*	*li*	*ul*
m̥	*a*[2]	*a*[2]	*ę*	*im̃, um̃*	*am*	*a*	*äm*[5]	*am*	*a*[2]	*em*	*em*[7]	*um*
n̥	*a*[2]	*a*[2]	*ę*	*iñ, uñ*	*an*	*a*	*än*[5]	*an*	*a*[2]	*en*	*en*[7]	*un*

1. -*r̥* > -*ar*; stressed *$r̥p$, *$r̥k$ > YAv. *əhrp*, *əhrk*, *$r̥t$ > YAv. *əš*.
2. *am*, *an* before sonant.

3. BSl. had *ir*, *ur* etc. (*ur* after labiovelar). This became Slav. *ьr*, *ъr*, etc.; *ьm*, *ьn* > *ę* (at the end of the word > -*ь*). In OCS *ьr* and *ъr* merged in *ŗ*, which is written as *rь* or *rъ*.

4. Lith. *ìr̃* as against *ìr* < *ŗH*.

5. *ar/er* etc. in anlaut.

6. *ro*, *lo* in Aeolic and Mycenaean; *ar*, *al* before sonant (and by analogy).

7. from PCl. *am*, *an*.

8. *aur* = [ɔr] < PGm. **ur*.

PIE **ḱrd-* 'heart': Skt. gen. *hŗdás* (*h-* anal.), Av. *zərəδaiia-* (*z-* anal.), OCS *srъdьce*, Lith. *širdìs*, Hitt. gen. *kardiyas*, Gr. *kradíē* (*kard-* anal.), Lat. *cor*, *cordis*, OIr. *cride* (Goth. *hairto* from the nom. **ḱērd*)

PIE **gʷmti-* 'going, coming': Skt. *gáti-*, Gr. *básis*, Lat. *con-ventiō*, Goth. *ga-qumþs*, OHG *cumft*

PIE **ṇ-* 'un-, not-' : Skt. *á-jñāta-* 'unknown', Arm. *ancanawtʿ*, Gr. *ágnōstos*, Lat. *ignōtus* (< **en-gnō-*), OIr. *ingnad*, Goth. *unkunþs*, E. *un-*(*known*)

As a rule of thumb for the vocalization of resonants we can say that **R* usually becomes **Ŗ* in between PIE obstruents or between an obstruent and a word boundary, that is, in the environments **TRT*, **#RT-* and **TR#* (*T* = a PIE stop or **s*, # = word boundary). When several resonants occur one after the other, the vocalization depends on the phonotactics and the morphological constraints of the individual languages. For the combination *ŗH* (before consonant or vowel) see Section 11.8.5.

Exercise 10

Reconstruct the PIE phonemes to which the bold-face sequences go back (one solution per question):

a.   Lith. *vi̇̃lkas*, OCS *vlъkъ*, Av. *vəhrka-*'wolf'

b.   Goth. *munþs* 'mouth', Lat. *mentum* 'chin', Welsh *mant* 'jaw'

c.   OCS *snъxa*, OE *snoru* 'daughter-in-law'

d.   Gr. *ónoma*, Skt. *nā́ma*, OCS *imę*, Lat. *nōmen* 'name'

e.   Skt. *óṣāmi*, Lat. *ūrō* 'I burn'

f.   OIr. *óac*, Skt. *yuvaśá-* 'youth', Lat. *iuvencus* 'bullock'

g.   Av. *yāsta-*, Gr. *zōstós* 'girded'

h.   Breton *hen*, Lith. *sēnas*, Arm. *hin* 'old'

i.   Arm. *gorc*, Gr. *érgon* 'work'

j.   Lat. *poscō* (< **pork-skō*), OHG *forsca* 'I ask' (< Gm. **furh-ska-*), Lith. *pir̃šti* 'to engage'

k.   Skt. *ū́dhar*, Gr. *oũthar* 'udder'

l.   Skt. *matíḥ* 'thought', Lat. *mens*, gen. *mentis* 'mind', OCS *pa-mętь* 'recollection'

11.6 The vowels

11.6.1 The short vowels (*e, *o)

PIE had only two vowels: *e* and *o*.

PIE	Skt.	Av.	OCS	Lith.	Arm.	Alb.	Toch.	Hitt.	Gr.	Lat.	OIr.	Goth.
e	a	a	e	e	e	e, je, ja[3]	ä[4]	e, i, a[5]	e	e	e	i[7]
o	a[1]	a[1]	o	a	o, a, u[2]	a	A a, B e	ā, a[6]	o	o	o	a

1. in open syllable *ā* (Brugmann's law).
2. *a* in open non-final syllable (except before *w or Co), *u* before a nasal, *o* elsewhere.
3. *e* after *Cr*, *Cl* and before *NC*; *ja* by *a*-mutation.
4. unaccented A Ø, accented B *a*.
5. *e* when stressed, *i* in posttonic closed syllable, *a* in posttonic open syllable.
6. *ā* when stressed, *a* when unstressed.
7. *e* in the other Germanic languages (*i* by *i*-mutation).

> PIE *med^hu* 'honey drink, mead': Skt. *mádhu*, OCS *medъ*, Lith. *medùs*, Gr. *méthu*,
> OIr. *mid* (*i* < *e* because of *-u), OE *medu*
>
> PIE *k^woteros* 'who of both': Skt. *katará-* (short first *a* analogical), OCS *kotoryjь*,
> Lith. *katràs*, Gr. *póteros*, Goth. *hwaþar* (*a* < *e* before *r*).

It has been established that short *o at the end of a syllable became *ā* in Indo-Iranian: **Brugmann's law**. This insight has proven to be of great importance in PIE reconstruction, see the next section.

> PIE *ǵonu* 'knee': Skt. *jā́nu*, Av. *zānu*, Arm. *cunr*, Toch. *kanweṃ/kenīne*, Gr. *gónu*
> (Hitt. Lat. *genu* with PIE *e*)

11.6.2 No PIE *a

The indications for the existence of a PIE phoneme *a have been scarce from the beginning. Since the discovery of the laryngeals, most instances of *a can be explained from the combination *h_2e.

For instance, in anlaut an *a-* which interchanges with *o-* or zero can be easily explained as deriving from *h_2e-. We are therefore dealing with the normal ablaut sequence *e/o/Ø*:

> *a/o* in Gr. *ákros* 'highest', *ókris* 'tip, point' from *h_2e-/*h_2o-
> *a/Ø* in Lat. *agō*, *gerō* from *h_2eǵ-, *h_2ǵ-es-
> *ai/i* in Gr. *aithós* 'sparkling', *itharós* 'clear' from *$h_2$eid^h-/*$h_2$id^h-

A frequent ending for which *-a* was previously reconstructed was the 1 sg. perfect, Skt. *-a*, Gr. *-a*. Lycian *-χα* (and Hitt. *-hun* < *-ha* + *-un*) indicates that *-a* goes back to *-h₂e*. This explains, moreover, the difference between:

Skt. 1 sg. pf. *ja-gám-a* < *g^we-g^wom-h_2e*

and

Skt. 3 sg. pf. *ja-gā́m-a* < *g^we-g^wom-e*

In the last case the *o* was in open syllable and became *ā*; in the first case it was in a closed syllable and remained short. This discovery, that a laryngeal — which would later disappear — makes a syllable a closed one, explains different exceptions to Brugmann's law, which was only generally accepted because of this discovery.

The three other endings for which **a* has been assumed were 1, 2 and 3 sg. middle, for example Gr. *-mai*, *-sai*, *-tai*. When Mycenaean *euketo* /*eukhetoi*/, 'he declares', was discovered, with *-toi* instead of *-tai*, it was realized that the secondary endings (of the past tense) 2 and 3 sg. were *-so*, *-to*, and that the primary ending was (often) formed by means of the addition of *-i* (such as active *-s*, *-t* : *-si*, *-ti*), so that *-toi* (and thus *-soi*) were probably the older forms. (By the way, *-soi*, *-toi* probably do not date back to PIE.) Gr. *-ai* came from the 1 sg. Cypriot still had 1 sg. *-mai*, 3 sg. *-toi* (the 2 sg. is unknown). So now only the 1 sg. ending has to be explained.

1 sg. Gr. *-mai* corresponds with Skt. *-e* < *-ai*. The system,
primary   Gr. *-mai*   Skt. *-e* < *-ai*
secondary   *-mān*   *-i*,

can be explained as follows: Skt. *-i* probably derives from *-h_2*, which was the actual ending; Skt. *-ai* will be the thematic form with *-o-* + this *-i*. Gr. *-mai*, *-mān* must be based on *-maH-i*, *-maH-m*, of which *-maH* is the regular development from *-m̥h_2* (see 11.9.5). This means that Greek has added *-m* before the ending *-h_2* (cf. active *-m*[*i*], *-s*[*i*], *t*[*i*]).

When the *a* from a laryngeal is factored out, only expressive words and loanwords containing **a* remain. There are often no exact correspondence between the expressive words (also emotional and pejorative words) of different languages (Skt. *kákhati* 'to laugh', Gr. *bárbaros*) and the same goes for nursery words (Goth. *atta* 'father'). Many alleged loanwords with **a* were probably not borrowed into PIE, but entered the daughter languages at a later stage (Gr. *kápros* 'goat', Lat. *faba* 'bean').

In the end, there are no grounds for assuming a PIE phoneme **a*. It has been claimed that PIE must still have had a phoneme **a* since a language with the phonemes **e*, **o* but without a phoneme **a* would be unlikely; such a system is said to leave a gap in the phonetic distribution of the vowel sounds. However, the reconstructions **e* and **o* are only notational conventions; it is likely that these were phonetically

more centralized vowels (e.g. [æ] and [ʌ]), so that the PIE phonetic space was filled in a typologically plausible way.

11.6.3 The long vowels (*$\bar{e}$, *$\bar{o}$)

The long vowels had a completely different status from the short ones. The 'real' PIE long vowels *$\bar{e}$ and *$\bar{o}$ are found much more rarely than *e and *o, and they seem originally to have arisen from phonetic lengthening of *e and *o in monosyllables and before word-final resonants (see Section 12.3). Many other apparent cases of $\bar{e}$ and $\bar{o}$ turn out to reflect sequences of short vowels plus a laryngeal, such as $\bar{e}$ from *eh_1 and $\bar{o}$ from *eh_3 or *oH. Apparent long $\bar{a}$ was in reality *eh_2, and long $\bar{\imath}$ and $\bar{u}$ always go back to PIE *iH, *uH.

PIE	Skt.	Av.	OCS	Lith.	Arm.	Alb.	Toch.	Hitt.	Gr.	Lat.	OIr.	Goth.
$\bar{e}$	$\bar{a}$	$\bar{a}$	$\check{e}$	$\dot{e}$[1]	i	o	–[2]	$\bar{e}, e$[3]	$\bar{e}$	$\bar{e}$	$\acute{\imath}$[1]	e[1]
$\bar{o}$	$\bar{a}$	$\bar{a}$	a	uo	u	e	–[2]	$\bar{a}, a$[3]	$\bar{o}$	$\bar{o}$	$\acute{a}, \acute{u}$[4]	o[1]

1. Lith. $\dot{e}$, OIr. $\acute{\imath}$, Goth. e, o are long vowels.
2. disputed; perhaps word-internal *$\bar{e}$ > A a / B e, *$\bar{o}$ > $\bar{a}/\bar{a}$; final *$\bar{e}$ > -$\bar{a}$, *-$\bar{o}$ > -u
3. $\bar{e}$ and $\bar{a}$ when stressed, e and a when unstressed.
4. $\acute{u}$ in final syllables.

   PIE *$\hat{k}\bar{e}rd$ 'heart': Skt. $h\acute{a}rdi$ (with anal. h-), Arm. $sirt$, Gr. $k\bar{e}r$
   PIE *$m\acute{e}h_2t\bar{e}r$ 'mother': Skt. $m\bar{a}t\acute{a}$, Lith. $m\acute{o}t\dot{e}$, Arm. $mayr$, Alb. $mot\ddot{e}r$ ('sister'), Toch. $m\bar{a}car$ / $m\bar{a}cer$, Gr. $m\acute{e}t\bar{e}r$, Lat. $m\bar{a}ter$ ($\bar{e}$ shortened before -C), OIr. $m\acute{a}thir$, OHG $muoter$, E. $mother$
   PIE *$n\acute{e}p\bar{o}t(s)$ 'grandson': Skt. $n\acute{a}p\bar{a}t$, Lith. $nepuotis$, Alb. $mbes\ddot{e}$ 'niece' < *$nep\bar{o}ti\bar{a}$, Lat. $nep\bar{o}s$, $nep\bar{o}tis$, W. nei (with -i < -$\ddot{u}$ < -$\bar{o}$ in final syllables); OE $nefa$ 'grandson, nephew', with shortening in final syllable.

11.7 The diphthongs

11.7.1 The short diphthongs

By 'diphthong' we mean a sequence of a vowel (e, o) plus i or u within one syllable. The diphthongs in PIE were simply combinations of two phonemes, for example, e + i. We will deal with them here because they sometimes show developments in which they behave as a single unit. There were no diphthongs with a- (because there was no phoneme a in PIE), but after PIE such diphthongs came into being under the influence of h_2 when juxtaposed with e: h_2ei, eh_2i > ai.

PIE	Skt.	Av	OP	OCS	Lith.	Arm.	Toch.	Hitt.	Gr.	Lat.	OIr.	Goth.
ei	*e*	*aē, ōi*[1]	*ai*	*i*	*ei, ie*[2]	*ē*	*i*	*e*	*ei*	*ī*	*ía*[5]	*ei*[7]
oi	*e*	*aē, ōi*[1]	*ai*	*ě*	*ai, ie*[2]	*ē*	*e/ai*[3]	*e, ai*[4]	*oi*	*ū*	*oe*	*ai*
h₂ei	*e*	*aē, ōi*[1]	*ai*	*ě*	*ai, ie*[2]	*ay*	*e/ai*[3]	*e, ai*[4]	*ai*	*ae*	*ae*	*ai*
eu	*o*	*ao, əu*[1]	*au*	*ju*	*iau*	*oy*	*u*	*u*	*eu*	*ū*	*úa*[6]	*iu*
ou	*o*	*ao, əu*[1]	*au*	*u*	*au*	*oy*	*o/au*[3]	*u, au*[4]	*ou*	*ū*	*úa*[6]	*au*
h₂eu	*o*	*ao, əu*[1]	*au*	*u*	*au*	*aw*	*o/au*[3]	*u, au*[4]	*au*	*au*	*úa*[6]	*au*

1. *aē* in open syllables, *əu* before *š* and in OAv.
2. *ie* under the stress (through *ē).
3. A *e, o*, B *ai, au*.
4. *ai, au* before dentals.
5. *é* before palatal consonants.
6. *ó* before velars and unstressed.
7. *ei* = [*ī*].

> PIE *h₁ei-ti 'he goes': Skt. *éti*, Av. *aēiti*, OP *aitiy*, OLith. *eiti*, Gr. *eīsi*, Lat. *īt*
> PIE *snoigʷʰos 'snow': Skt. *sneháyati* 'to cover with snow', OCS *sněgъ*, Lith. *sniẽgas*, OPr. *snaygis*, Goth. *snaiws*, E. *snow*
> PIE **deuk-* 'to carry': Lat. *dūcō*, Goth. *tiuhan*, OHG *ziohan*, OE *tēon*
> PIE *h₂eus 'ear': NP *hōš*, OCS *uxo*, Lith. *ausìs*, Lat. *auris*, OIr. *áu, ó*, Goth. *auso*, OHG *ōra*, E. *ear*

11.7.2 The long diphthongs

Long diphthongs were very rare. They consisted of combinations of long *ē* or *ō* with *i* or *u* in one syllable (thus, before consonants or at the end of a word). PIE *ē, ō* themselves were only infrequently found, viz. 1. in monosyllables 2. at the end of a word before *r, l, n, i, u*. Long diphthongs can therefore be found in (originally) monosyllabic forms, such as in the *s*-aorist, and at the end of a word, i.e., in endings. A third category of long diphthongs has often been reconstructed for contracted sequences of two short vowels plus *i* or *u*, for example, in dat. sg. **-ōi* < **-o-ei* (see Section 13.2.9). But such sequences were probably still disyllabic in PIE (**-oh₁ei* or **-oˈei*), and we will disregard them here. Since PIE *eh₂i gave short *ai*, a long diphthong *āi* could only arise from *h₂ēi and from **-eh₂ei* (via **-aai-*).

Many developments are unclear, because there are so few reliable examples and because analogical developments possibly occurred in the endings. In inlaut, long diphthongs have often become short diphthongs in the individual languages (sometimes differing from the old short diphthongs, which were monophthongized) before tautosyllabic consonants (**Osthoff's law**). In auslaut the sonant sometimes disappears

(*-i* more often than *-u*), which is why auslaut sequences are separately given in the table below.

PIE	Skt.	Av.	OCS	Lith.	Toch.	Hitt.	Gr.	Lat.	Goth.[3]
ēi	*ai*	*āi*	*i*				*ei*	*ī*?	
ōi	*ai*	*āi*	*y*[2]	*ai*		*ai*	*oi*	*ī*	
ēu	*au*	*āu*			A *o*, B *eu*		*eu*	*ū*?	
ōu						*au*	*ou*		
-ēi	*-ā*	*-ā*[1]	*-i*				*-ēi*		*-ai*
-ōi	*-ā*	*-ā*[1]					*-ō*		
-ēu	*-au*	*-āu*	*-u*	*-iau*				*-ū*?	*-au*
-ōu							*-ō*		

1. OAv. *-ā*, YAv. *-a*
2. only before *s*.
3. short diphthongs in auslaut become *-a*.

PIE *Diēus 'the god of light, Zeus': Skt. *Dyáus*, Gr. *Zéus*, Hitt. *sīus* (<*ši-i-ú-uš*>)
PIE *dēiḱst 'he showed' (*s*-aor.): Av. *dāiš*, Gr. *deíkse*; **-lēikʷst* > Skt. *-raik*; *kʷēitst > OCS *čisъ*
PIE **-ōis* (*-oh₁eis*?) instr. pl.: Skt. *vṛ́kais*, Av. *vəhrkāiš*, OCS *vlъky*, Lith. *vilkaĩs*, Gr. *lúkois* (*theoĩs*), Lat. *lupīs*
PIE **-ēi* loc. sg.: Skt. *agnā́*, Goth. *anstai*
PIE **-ōi* nom. sg.: Skt. *sákhā*, YAv. *haxa*; Gr. *peithṓ*
PIE **-ēu* loc. sg.: Skt. *áktau*, OCS *synu*, Lat. *noctū*, Goth. *sūnau*

It appears that word-final long diphthongs lost the final glide in Indo-Iranian (**-ēi*, **-ōi*) and in Greek (**-ōi*, **-ōu*). This may be contrasted with its retention in the ending **-oh₁ei*, which yields IIr. *-āi* and Gr. *-ōi*.

A different case is presented by some roots ending in vowel plus laryngeal. If such roots took the suffix **-i*, the result often was a long diphthong in the daughter languages. Thus Lat. *fēmina* 'woman' is derived from the root **dʰeh₁-* 'to suck'. With an additional *-i* a short diphthong was the result, **dʰeh₁i-* > **dʰei-*, e.g. Skt. *dhenú-* 'cow'. Before the laryngeal theory was established the suffixal nature of *i was not clearly recognized, and roots as these were sometimes reconstructed with a long diphthong, **dʰēi-*.

Exercise 11

Reconstruct the PIE phonemes from which the bold-face sounds are derived:

a.   Goth. *qim*an, Toch. B *šäm-*, Av. *jam-* 'to come'
b.   Lat. *host*is, Goth. *gast*s 'guest, stranger'
c.   OIr. *ech*, Lat. *equus*, Skt. *áśva-* 'horse'
d.   Welsh *nos*, Lith. *naktis*, Skt. *nák* 'night'
e.   OIr. *fed*im, OCS *vest*i, Av. *vad-* 'to lead'
f.   Gr. *húdōr* 'water', Hitt. *ú-i-ta-a-ar* /wi*dār*/ (pl.) 'waters'
g.   Goth. *raups* (< *raudaz*), OIr. *rúad*, Lat. *rūbidus* 'red'
h.   Lat. *mūn*us 'task', Goth. *gamains* 'common', OCS *měn*a 'exchange'
i.   Skt. *uṣā́sam*, Gr. *ēóa* (< *ēwoha* < *ausosa*) 'dawn' (acc.sg.)
j.   Lat. *rēx*, OIr. *rí*, Skt. *rā́j-* 'king'
k.   Hitt. *zahhai[s]* 'fight', Gr. *peithṓ* 'power of persuasion', Skt. *sakhā́* 'associate'
l.   Lat. *socius*, Av. *haxi-*, Skt. *sakhi-* 'companion'

Exercise 12

Explain the following bold-faced vowel correspondences in view of the basic principles of PIE ablaut (Section 12.2):

a.   Goth. *liug*an   versus   OCS *lьg*ati 'to lie'
b.   Goth. *uf-þanjan* 'to expand'   Lat. *tenēre* 'to hold'
c.   OCS *sněgъ* 'snow'   Lat. *nix*, gen. *nivis*
d.   Lat. *pons* 'bridge', Av. *pantå* 'road'   Skt. *pathás* 'road' (gen.), OPr. *pintis*

11.8   The laryngeals

The discovery of the three phonemes now called laryngeals (*h_1, *h_2, *h_3) was told in Section 9.4. They functioned as consonants in the PIE phonemic system, but just like the sonants (§ 11.5), the laryngeals often yield vowels when occurring next to PIE stops. In such cases they are sometimes (though rarely) notated as *$\mathring{h}_1$, etc., or previously as *$ə_1$, etc.

The laryngeal theory has had many consequences for PIE reconstruction. We have already seen that it enables us to discard *a as a PIE phoneme (11.6.2) as well as the voiceless aspirates (11.3.5). The discovery of the laryngeals has also been of tremendous importance for PIE morphology. Roots which initially seemed to end in a long vowel now turned out to end in a short vowel + laryngeal (*$d^h\bar{e}-$ = *d^heh_1-) and roots which appeared to begin with a vowel had a laryngeal: *$a\acute{g}-$ = *$h_2e\acute{g}-$, *$ed-$ = *h_1ed-. Hence all Indo-European roots had the structure *CeC* (*e* = *e*/*o*/Ø) (see Chapter 12).

The phonetic reality of the 'laryngeals' is uncertain. It is possible that $*h_1$ was a glottal stop (ʔ), $*h_2$ a pharyngeal (ʕ, known from Arabic) and $*h_3$ a labialized pharyngeal (ʕʷ). One of the reasons to assume a glottal stop for the first laryngeal is that it does not colour an adjacent $*e$. The labialization of the third laryngeal seems plausible because it gives (or colours e to) o in many languages.

Here is an overview of the main laryngeal developments, which will be elucidated in the following subsections:

PIE	Skt.	Av.	OCS	Lith.	Arm.	Alb.	Toch.	Hitt.	Gr.	Lat.	OIr.	Goth.
CHC	i^4	$i, Ø^5$	Ø	Ø	$a, Ø^7$	a	$ā$	Ø	$e/a/o$	a	a	$a, Ø^{15}$
HC-	Ø	Ø	Ø	Ø	$e/a/o$	Ø	Ø	$a, h, Ø$	$e/a/o$	Ø	Ø	Ø
h_1e^1	a	a	e	e	e	e	$ä$	e	e	e	e	i
h_2e	a	a	o	a	ha-, a^8	a	$ā$	$(h)a^{11}$	a	a	a	a
h_3e	a	a	o	a	ho-, $o/a/u^9$	a	A a, B e	$(h)ā^{11}$	o	o	o	a
Ho	a	a	o	a	a-, $o/a/u^9$	a	A a, B e	$ā, a$	o	o	o	a
eh_1^2	$ā$	$ā$	$ě$	$ė$	i	o	$–^{10}$	e, i	$ē$	$ē$	$í$	e
eh_2	$ā$	$ā$	a	o	a	o	$–^{10}$	$a(h)^{12}$	$ā^{13}$	$ā$	$á$	o
eh_3^3	$ā$	$ā$	a	uo	u	e	$–^{10}$	a	$ō$	$ō$	$á, ú^{14}$	o
iHC	$ī$	$ī$	i	y^6	i	i	$yā$	i	$ī$	$ī$	$í$	ei^6
uHC	$ū$	$ū$	y	$ū$	u	$y, -i$	$wā$	u	$ū$	$ū$	$ú$	$ū$

1. development as with $*e$.
2. development as with $*ē$.
3. development as with $*ō$.
4. seldom Ø.
5. i in the final syllable, Ø in inlaut, i in initial syllable before CC.
6. $y, ei = [ī]$
7. a in initial syllable and before a consonant cluster; otherwise zero.
8. ha- in anlaut, a elsewhere.
9. ho- and a- in anlaut, as $*o$ elsewhere.
10. disputed; perhaps
    $eh_1 >$ A a/ B e; final $*ē > -ā$
    $eh_2 > a/o$
    $eh_3 > ā/ā$; final $*-ō > -ū$
11. $ha, hā$ in initial position.
12. $h < *h_2$
13. Ion.-Att. $ē$, except after e, i, r.
14. $ú$ in final syllables
15. Ø in inlaut.

11.8.1   Laryngeal between consonants

In Greek we see $*h_1 > e$, $*h_2 > a$, $*h_3 > o$ (but Ø before and after $i̯$?), in Indo-Iranian all laryngeals become i or Ø, whereas the other languages have a or Ø.

> PIE $*ph_2tḗr$ 'father': Skt. *pitā́*, Av. *(p)tā* (dat. *piϑrē*), Arm. *hayr < *haþir*, Toch. *pācar/pācer*, Gr. *patḗr*, Lat. *pater*, OIr. *athir*, Goth. *fadar*
> PIE $*ish_1ros$ 'holy': Skt. *iṣirá-*, Gr. *hierós < *iherós*
> PIE $*dh_3tos$ 'given': Gr. *dotós*, Lat. *datus*
> PIE $*dʰugh_2tēr$ 'daughter': Skt. *duhitā́*, Av. *dugədā*, OCS *dъšti*, Lith. *duktḗ*, Arm. *dustr*, Toch. *ckācar/tkācer*, Gr. *thugátēr*, Goth. *dauhtar*

11.8.2   Laryngeal before consonant at the beginning of the word

In Greek and Armenian (and, probably, also in Phrygian) the laryngeal became *e*, *a*, *o*, but in most of the other languages it disappeared with little trace. In Hittite, $*h_2$- seems to give *h*- before consonants, whereas $*h_1$- and $*h_3$- in principle yield Ø, unless they are restored, in which case they yield *a*-.

> PIE $*h_1rudʰrós$, $*h_1roudʰos$ 'red': Skt. *rudhirá-*, OCS *rudъ*, Lith. *raũdas*, Toch. *rtärye/rätre*, Gr. *eruthrós*, Lat. *ruber*, OIr. *rúad*, Goth. *rauþs*, E. *red*
> PIE $*h_1me$ 'me': Skt. *mā*, OCS *mę*, OPr. *mien*, Arm. *im < *em-*, Alb. *më*, Hitt. *am-muk*, Gr. *emé*, Lat. *mē*, Goth. *mik*, E. *me*
> PIE $*h_2ues-$ 'to sojourn, remain': Skt. *vásati*, Arm. *gov* (Armenian has no vowel before $*u̯$-), Hitt. *huiszi*, Gr. aor. *áesa < *au̯es-*, MW *gwest* (*gw- < *u̯-*) 'place to rest', Goth. *wisan*, cf. E. *was*
> PIE $*h_3n(e)id-$ 'to taunt': Skt. *níndati* (with *n*-infix), Arm. *anicanem* (*a- < *o-*), Lith. *níedėti*, Gr. *óneidos*, Goth. *ganaitjan*

In Greek there are no cases known of $*Hi̯- > Vi̯-$. It has been argued that $*Hi̯-$ gave Gr. *h*- whereas plain $*i̯-$ yielded *z*-: Gr. *husmínē* 'battle' $< *Hiudʰ-$ (to Skt. *amitrāyúdh-* 'fighting the enemy' $< *amitra-Hyudh-$) vs. *zugón* 'yoke' $< *iugom$. It is very difficult to be certain about the presence or absence of word-initial laryngeals before PIE $*i$, however, so that the Greek distribution is not absolutely certain.

    If the initial laryngeal was followed by two or more consonants we sometimes find special developments, such as in the cluster $*HRC-$ (11.8.6).

11.8.3   Laryngeal before vowel

An adjacent $*e$ was colored by $*h_2$ to *a*, and by $*h_3$ to *o*. When the laryngeal disappeared the *a*, respectively the *o*, were phonologized. In this way a phoneme *a* came into existence (after PIE), which in many languages merged with $*o$ at a later stage. In Hittite $*h_1$

disappeared, and *h_2 remained in anlaut as *h-*, as did probably also *h_3 (both perhaps only before *e*, not before *o*). The Armenian *h-* can perhaps be explained in this way too.

> PIE *h_1es- 'to be': Skt. *ásmi*, OCS *jesmъ*, OLith. *esmì*, Arm. *em*, Alb. *jam*, Hitt. *esmi*, Gr. *eimí*, OIr. *am* (*a-* in unstressed form), Goth. *im* 'I am', Lat. *est* 'is', E. *am*, *is*
> PIE *h_2enti 'against': Skt. *ánti*, Hitt. *hanti*, Gr. *antí*, Lat. *ante*
> PIE *h_3eui- 'sheep': Skt. *ávi-*, OCS *ovь-ca*, Lith. *avìs*, Arm. *hoviw* 'sheep-herder' < *h_3eui-peh_2-, Luw. *hawi-*, Gr. *óis*, Lat. *ovis*, W. *ewig* < *$owī$-$kā$, Goth. *awistr*, OHG *ewist* 'sheepfold' < *awi-$st(r)o$-, OHG *ouwi* < PGm. *$aujō$, E. *ewe*
> PIE *h_2oiu 'a long time': Skt. *áyu* (*o* in open syllables > *ā*), Gr. *ou* 'not' (from *ne … *h_2oiu); cf. Lat. *aevum* < *h_2eiuom

In inlaut after a consonant in Indo-Iranian both voiceless and voiced obstruents became aspirated; in Hittite it seems that a geminate developed.

> PIE *$plth_2u$- 'broad': Skt. *pṛthú-*, Av. *pərəθu-*; Gr. *platús*, OIr. *lethan* < *$litano$- < *$plth_2$-no- (*-th-* < *t* is an OIr. lenition)
> PIE *-th_1e ending 2pl.: Skt. *-tha*, Av. *-θa*, Hitt. *-tteni*, Gr. *-te*
> PIE *$meǵ$-h_2- 'large, great': Skt. gen. *mahás* < *mag^h-; Hitt. *mekki-*; Arm. *mec*, Gr. *mégas*, Goth. *mikils*, OE *micel* < *$meǵ$-; Alb. *madh* < *$mǵ$-.

In Indo-Iranian it appears from the metre that the laryngeal sometimes must have still been present in this position, because the preceding syllable is measured long. For example, *avase* 'in order to help' has a long first syllable, which points toward *$auHasai$.

Between vowels (VHV) both the preceding and the following *e* were colored:

> PIE *-eh_2-es nom. pl. *ā*-(= eh_2)stems: Lith. *-os*, Goth. *-os* (both *ō* < *$ā$)

In Indo-Iranian such forms are often still disyllabic in the oldest poetry: Skt. *bhā́s* 'light' = /*bhaas*/ < *b^heh_2-os.

The sequence -eh_2i- became -*ai*-:

> PIE *deh_2i-uer- 'husband's brother': Skt. *devár-*, OCS *děverъ*, Lith. *dieverìs* (acc. *díeverį̃*), Arm. *taygr*, Gr. *dāḗr* (< *$daiu̯ēr$).

11.8.4 Laryngeal after vowel before consonant

The vowel was lengthened at the disappearance of the laryngeal, and *e* was possibly colored. In Hittite h_2 remains as *h* before *s*.

> PIE *seh_1- 'to sow': OCS *sějǫ*, Lith. *séju*, Lat. *sēmen*, OIr. *síl*, Goth. *mana-seþs* 'world, humankind < human seed', E. *seed*
> PIE *peh_2- 'to protect': Skt. *pā́ti*, Hitt. *pahs-zi*, Lat. *pāstor*
> PIE *poh_2iu 'herd' (from the same root *peh_2-): Skt. *pāyú-* 'protector', Gr. *poū*

PIE *deh₃-* 'to give': Skt. *dádāmi*, *dā́nam* 'gift', OCS *dati*, *darъ*, Lith. *dúoti*, Gr. *dídōmi*, *dōron*, Lat. *dōnum*

PIE **piHuon-* 'fat': Skt. *pī́van-*, Gr. *pī́on-*

PIE **dʰuHmo-* 'smoke': Skt. *dhūmá-*, Lat. *fūmus*, Lith. *dū́mai* (pl.), OCS *dymъ* 'smoke', Gr. *thūmós* 'spirit'

Exercise 13

Reconstruct the PIE phonemes from which the bold-face sounds are derived. If you need to reconstruct laryngeals and you find that several combinations are theoretically possible, always opt for the most economical solution.

a. Lat. ***cat**us* 'pointed', OIr. ***cath*** 'wise', Skt. ***śitá-*** 'sharp'
b. Gr. ***anér**a*, Skt. ***nár**am* 'man' (acc.sg.)
c. Gr. ***ereb**os*, Goth. ***riq**is*, Arm. ***erek*** 'darkness'
d. Skt. ***raghú-*** 'light, fast', E. ***lung***, Gr. ***elakhús*** 'little'
e. Gr. ***ost**éon*, Hitt. ***hast**āi*, Av. ***asti*** 'bone(s)'
f. Lat. ***tag**āx* 'touchy', Gr. ***tetag**ṓn* 'having caught', OE ***þacc**ian* 'to touch lightly'
g. Lat. ***ax**is*, Lith. ***ašis***, OCS ***osъ***, NHG ***Achse*** 'axis'
h. Gr. ***kápt**ō*, Lat. ***capi**ō*, Goth. ***haf**ja* 'I heave'
i. Lat. ***spū**ma* (< **spoi*ma), Skt. ***phéna-***, OE ***fām*** (< PGm. **fai*ma) 'foam'
j. Gr. ***kaulós*** 'bar', Lith. ***káulas*** 'bone', Lat. ***caulis*** 'stalk', OIr. ***cúal*** 'bundle'
k. Hitt. ***arki-*** 'testicle', Arm. ***orji-k'*** 'testicle', Gr. ***órkhis*** 'testicle', Lith. ***aržùs*** 'lustful'
l. Lith. ***výras***, Skt. ***vīrá-*** 'man, hero'

Exercise 14

Reconstruct the PIE origin of the long vowel in the following Latin words. Take into account the cognate words given and the PIE ablaut:

a. Lat. *sēmen* 'seed' (*satus* 'sown')
b. Lat. *pāx* 'peace' (*pacīscor* 'to agree')
c. Lat. *pōtāre* 'to drink' (Gr. *pósis* 'a drink')

11.8.5   Laryngeal after sonant

The group sonant + laryngeal (*RH*; *R = r, l, m, n*) after a consonant shows some exceptional developments. We must distinguish between preconsonantal and prevocalic position.

CrHC, ClHC, CmHC, CnHC

PIE	Skt.	Av.	OCS	SCr.	Lith.	Arm.	Toch.	Gr.	Lat.	OIr.	Goth.
rH	*ī/ūr*[1]	*arə*	*rъ/ъ*	*r̃*	*ì/ùr*[2]	*ara*	*rā*	*rē/ā/ō*	*rā*	*rá*	*aur*[3]
lH	*ī/ūr*[1]	*arə*	*lъ/ъ*	*ũ*	*ì/ùl*	*ala*	*lā*	*lē/ā/ō*	*lā*	*lá*	*ul*
mH	*ā*	*ā*	*ę*	*ȅ*	*ì/ùm*	*ama*	*mā*	*mē/ā/ō*	*mā*	*má*	*um*
nH	*ā*	*ā*	*ę*	*ȅ*	*ì/ùn*	*ana*	*nā*	*nē/ā/ō*	*nā*	*ná*	*un*

CrHV, ClHV, CmHV, CnHV

PIE	Skt.	Av.	OCS	SCr.	Lith.	Arm.	Toch.	Gr.	Lat.	OIr.	Goth.
rH	*i/ur*	*ar*	*ъ/ъr*		*i/ur*	*ar*	*är/ar*	*ar*	*ar*	*ar*	*aur*[3]
lH	*i/ur*	*ar*	*ъ/ъl*		*i/ul*	*al*	*äl/al*	*al*	*al*	*al*	*ul*
mH	*am*	*am*	*ъ/ъm*		*i/um*	*am*	*äm/am*	*am*	*em*	*am*	*um*
nH	*an*	*an*	*ъ/ъn*		*i/un*	*an*	*än/an*	*an*	*en*	*an*	*un*

1. *ūr* in the neighborhood of labials.
2. *ur in* the neighborhood of labiovelars.
3. *aur* = [ɔr] < **ur*.

RH before consonant

In Tocharian the laryngeal was vocalized into *ā* (which is not a long vowel). In Germanic we find the same development as without the laryngeal (*r̥* > *ur*). Balto-Slavic also has the same development, but with an acute accent (instead of a circumflex; SCr. *r̃* as opposed to *r̃* < *r̥*; in the OCS texts the accent is not given; Lith. *ìr* as opposed to *ir̃* < *r̥*). Skt. *ā* comes via *aH* from *m̥H*. In Italo-Celtic we find *r̥H* > *raH* > *rā*, in Greek the laryngeal determined the vowel: *r̥h₁* > *reh₁* > *rē*, etc.

> PIE **plh₁no-* 'full': Skt. *pūrṇá-*, OCS *plъnъ*, SCr. *pȕn*, Lith. *pìlnas*, OIr. *lán*, Goth. *fulls* < PGm. **fulnaz*, E. *full*
> PIE **ǵnh₁tó-* 'born': Skt. *jātá-*, Av. *zāta-*, Gr. *kasí-gnētos* 'brother' < 'born together with', Gaul. *Cintu-gnātus* 'first born', Goth. *airþa-kunds* 'born of the earth'
> PIE **tlh₂tó-* 'carried': Gr. *tlātós*, *tlētós*, Lat. *lātus*, W. *tlawd* 'arm' (*aw* < *ā*)
> PIE **ḱmh₂tó-* 'which has cost labor': Skt. *śāntá-* (with anal. *-n-*), Gr. *polú-kmētos* 'which has cost much labor'
> PIE **strh₃-nó-*, *-tó-* 'laid down': Skt. *stīrṇá-*, Gr. *strōtós*, Lat. *strātus*

The laryngeal of *RHC-* in anlaut was vocalized in many languages, while the sonant was consonantal (it would, therefore, be misleading to write *R̥HC*):

> PIE **mh₂ḱrós* 'large, great': Hitt. *maklant-*, Gr. *makrós*, Lat. *macer*, OHG *magar*

The sequence *-ih₂* in auslaut usually yielded *-ī*, but in Germanic *-ya* after short vowel + single consonant (*wrakja*, but *bandi* < **-ī*), PToch. **-yā* (B *lāntsa* 'queen'), Gr. *-ia/-i̯a*:

PIE *$potnih_2$ 'mistress': Skt. *patnī́*, Gr. *pótnia*
PIE *(b^her)-ont-ih_2 '(bear)ing' fem.: Skt. *bhárantī*, OCS *nes-ǫšti* (anal. for *-ǭti),
Lith. *neš-antì*, Gr. *phér-ousa* < *-ont-i̯a, Goth. *frijondi*

RH before Vowel

In this case there is always a vowel before the sonant. An *e* that comes after the sonant
is colored by h_2.

PIE *$ḱmh_2$-e/o- 'to be tired': Gr. aor. *é-kam-on*, *kámatos* 'tiredness' < *$ḱmh_2$-etos
PIE *tlh_2-e/o- 'carry': Gr. pl. *tálanta* 'talent', Goth. *þulan* 'put up with, suffer', OE
þolian
PIE *g^wrh_2u- 'heavy': Skt. *gurú-*, Gr. *barús*, Goth. *kaurus* (Goth. *aur* < *ur)
PIE *tnh_2-(e)u- 'long, thin': Skt. *tanú-*, OCS *tьnъkъ*, Gr. *tanaós*, Myc. *tanawos*, Lat.
tenuis, OIr. *tanae* < *tanawio-, OIc. *þunnr*, E. *thin*

11.8.6 Laryngeal before sonant

There is not enough reliable evidence for all languages.

HRC- in anlaut. Greek vocalized the laryngeal: *e/a/oRC-* (it is therefore incorrect
to write *HṚC-*). In Sanskrit we find *HNC > HaC > aC*. Latin probably had *e/a/oNC*,
but always *a-* with *-rC-*, *-lC-*.

PIE *$h_1nu̯n̥$ 'nine' in compounds: Gr. *enu̯a > *ená-/einá-etes* 'nine years long'
PIE *h_2mb^hi 'around, surrounding': Skt. *abhí*, Alb. *mbi*, Gr. *amphí*, Lat. *amb-(īre)*,
Gaul. *ambi-*, OIr. *imb-* < *amb-, OHG *umbi*, G. *um*
PIE *h_3ng^{wh}- 'nail': Lat. *unguis* (*u-* < *o-*), OIr. *ingen* < *an-; cf. *h_3nog^{wh}-: OCS *noga*
'leg, foot', Lith. *nãgas*, Gr. *ónuks*, OHG *nagal*, E. *nail*

Hi/uC- in anlaut. Here we find initial *i-*, *u-* in all languages, even in Greek: *íthi* 'go!' <
*h_1i-d^hi, *itharós* 'clear' < *h_2id^h-. But before *u, Greek seems to show vocalization: *audḗ*
'voice' < *h_2udH-h_2- (full grade would be *h_2uedH- > *awed-, cf. *aēdṓn* 'nightingale' <
*$h_2uēdH$-). Certain proof for *au-* is hard to find, however, since a full grade (*h_2eu-)* is
often conceivable. In Hittite, *h_2i-, *h_2u- give *hi-*, *hu-*.

eHNC produced *ēNC* in Greek, but in Indo-Iranian *a(H)aC* with *a < N̥*:

PIE *meh_1ns 'month': Skt. *mā́s*, Av. *må* = /maah/, Gr. Lesb. gen. *mēnnos* < *mēns-
os*; cf. Lith. *ménuo*, Goth. *menoþs*, E. *month*

Since the loss of *H and the syllabification (or not) of *n were clearly post-PIE chang-
es, a notation as *$meh_1n̥s$ is incorrect and would only lead to confusion.

Exercise 15

Reconstruct the PIE phonemes from which the bold-face sounds are derived. If you need to reconstruct laryngeals and you find that several combinations are theoretically possible, opt for the most economical solution.

a.   Lat. *grātus* 'pleasant', Skt. *gūrtáḥ* 'famed'

b.   Skt. *ánti*, Lat. *ante* 'before', Hitt. *hant-* 'front'

c.   Lat. *ventus*, Skt. *vắtas*, Av. *vāta-* (metrically /*vaata-*/), Goth. *winds* [NB: Osthoff's Law] 'wind'

d.   Lat. *crābrō* 'hornet' < ****krāsrōn*, Lith. *širšuõ* (for ***šìršuo*), Dutch *horzel*.

e.   Skt. *bhrắtar-*, OIr. *bráthir*, Lat. *frāter* 'brother'

f.   Gr. *brakhús*, Av. *mərəzu-* 'short' [for Gr. *br-* cf. Chapter 4.7, last lines]

g.   OIr. *samail* (< ***samalis*), Lat. *similis* (< ***semalis*) 'similar'

Exercise 16

Reconstruct the PIE form of each of the given bold-faced forms. Per row each column contains a (single) different ablaut variant of the same root:

a.   Skt. *nắbhi-* 'hub; navel', OE *nabula*   Gr. *omphálos* 'navel' [< ***onphálos*]

b.   Goth. *letan* 'to let'   Goth. *lats* 'slow', Lat. *lassus* 'tired'

c.   Goth. *tamjan* 'to tame', Skt. *damáyati*   Gr. *á-dmē-tos* 'untamed' [<***ádmātos*]

11.9   Accentuation

11.9.1   Introduction

In languages with stress accent a single syllable takes the main stress, although there can also be secondary stresses; the accent is **culminative**. The accent consists of a higher tone, greater intensity (volume) and a lengthening of the vowel in different combinations. It is for this reason that one speaks of a dynamic or expiratory accent. Such accents often influence the vowels of adjacent syllables. English is a language which has this kind of accent. Within the languages with a stress accent, a distinction is made between those with a free and those with a fixed accent. In the latter case, there are fixed rules which determine which syllable receives the accent (e.g., the first or the last). If the accent is free, one needs to know which syllable is accented on a word-by-word basis. This, for example, is the case with Russian.

A different kind of accent-system is found in tone languages. Defining what a tone language is, is not easy, and the variety of phenomena within them is very great. Suffice it to say that accent in these languages principally consists of differences in

the tone levels. In the case of languages with a stress accent there is only one stress/accent, but in tone languages there are always several tones used, for example a high tone and a low. Alongside level tones there can be rising, falling and rising-falling tones, etc. Unlike in stress-accent languages we find that in tone languages more than one syllable receives distinctive characterization. It is possible that each syllable takes a certain tone. The pitch is often influenced by the adjacent consonants. Many African and East Asian languages are tone languages, but tone languages are actually found all over the world.

There are, however, many languages which cannot be placed in either of these two categories, and this is something which we shall also encounter. Thus, there are languages which highlight only one syllable, but do so by means of a higher tone or by means of a certain tonal contour. Ancient Greek, for example, had a rising (acute) and a rising-falling (circumflex) accent, for example *phorás* acc. pl. as against *phorās* gen. sg. This is referred to as a musical accent (pitch accent).

11.9.2   The Indo-European languages

Insofar as Indo-Iranian is concerned: the accent in Sanskrit will be dealt with in the following section (11.9.3). The Avestan accent is unknown, except for a few indirect indications. The Old Persian accent is also unknown.

The Balto-Slavic accent will be dealt with in Section 11.9.4.

In Armenian the accent was fixed on the penultimate syllable, after which the last syllable disappeared.

Albanian accented the last syllable of the verbal stems, and the last syllable of prepositions; nouns are often stressed on the penultimate syllable.

The Hittite accent is not well-known. Recent research confirms, however, that certain phenomena like vowel length were caused by the accent, from which it is possible to determine which syllables were stressed.

The Tocharian accent is only partially known. We know that in Tocharian A an unaccented *ä* in open syllables disappeared, that in Tocharian A and B an unaccented *ä* became *a*, and that in Tocharian B an accented *ä* became *a*. In Tocharian B disyllabic words had initial accent, while longer words accented the second syllable counting from the beginning of the word.

The accent in Greek will be dealt with in 11.9.3.

Latin accented the second syllable counting from the end if this was a long syllable (*amīcus*, *argéntum*), and otherwise the third syllable counting from the end (*púerī*). The syncope and the weakening of the vowel in the second syllable (*facilis* : *difficilis*) indicate, however, the presence of an initial accent at some earlier period.

Irish had an initial accent (accent on the first syllable), the British languages had an accent that fell on the penultimate syllable, after which the last syllable disappeared and the accent moved backward toward the (then) penultimate syllable.

The Germanic languages all had an initial accent. Traces of an older stage of development will be discussed in the following section.

11.9.3   Sanskrit, Greek and Germanic

Sanskrit accented one syllable per word. The accent consisted, according to Indian grammarians, of a high tone. It was a free accent, that is to say, it could fall on any syllable. The accent was called *udātta*, while unaccented syllables were called *anudātta*; *svarita* was the word used to describe the pitch drop that took place after the *udātta*. The so-called 'independent svarita' came into existence because of the disappearance of the syllable with the *udātta*, but the metre of the Rigveda indicates that this syllable was still there when the Rigveda was composed, for example *nadyàs < nadíyas*.

Greek had an acute (rising) accent and a circumflex (rising-falling) accent; the circumflex could only come on a long vowel or on a diphthong. The accent was a pitch accent, according to grammarians. The place of the accent was limited by the so-called 'limitation law': the accent could only fall on the last three syllables; the third syllable counting from the end (antepenultimate) could only be accented if the last syllable was a short one; the accent would then be an acute one (*ánthrōpos* but *anthrṓpou*). If the final syllable was a long one, then the accent would either fall on the final syllable (ultimate) or on the next-to-the-last (penultimate) syllable. If the final syllable was a long one and the penultimate syllable took the accent, the accent could be an acute one only (*dṓrou*, but *dõron*). In Ionic-Attic there was, moreover, the rule that if the penultimate syllable was long and took the accent while the final syllable was short, the accent would always be a circumflex (Att. *gunaîka*, but Dor. *gunaíka*). Aeolic drew the accent as far back as the 'limitation law' would allow (*oúranos* : Att. *ouranós*; *ámme* : Att. *hēmeîs < *hēmé-es*); the so-called Aeolic 'barytonesis'.

The Greek accent for a large part corresponds with that of Sanskrit, but limitation to the last three syllables is a Greek innovation. Both accents consisted of a raising of the tone. While the accent systems of the other languages (except that of Balto-Slavic) seem to suggest a total break with Proto-Indo-European, Sanskrit and, to a lesser extent, Greek, seem to suggest a continuity with the PIE practice. Proto-Indo-European had, then, a free accent which consisted of raising the tone. This picture is confirmed by a phenomenon in Germanic and by the accent system of Balto-Slavic.

For Germanic, **Verner's law** says that a voiceless stop or **s* became voiced unless the PIE accent directly preceded them (Section 11.3.8): Goth. *fadar < *ph₂tḗr*, but *broþar < *bʰréh₂tēr*. The accent system which this presupposes, agrees with that of Sanskrit and of Greek (Skt. *pitā́*, *bhrā́tā*; Gr. *patḗr*, *phrā́tēr*).

The old idea that the development of the long final syllables of Germanic was determined by the difference between an acute and a circumflex intonation is no longer tenable. Instead, the different Germanic reflexes in auslaut can be explained from the presence or absence of a final obstruent or a nasal.

11.9.4   Balto-Slavic

In the last decades the history of the Balto-Slavic accent-system has in principle been clarified. It now seems that Baltic and Slavic go back to the same system which can be reconstructed by means of Sanskrit and Greek (and with the help of Verner's law).

The accent-system of Old Church Slavonic is unknown. That is very unfortunate, for we are now limited to data from a much later period. There are very few old manuscripts of the Slavic languages which indicate their accent system (Old Russian, Middle Bulgarian), so that we must rely for the most part on material that is provided to us by the modern languages. Of these, the Serbo-Croatian dialects and Slovenian are important. The Slavic languages show a great deal of diversity in matters of accent, so that the linguist must always begin by reconstructing the Proto-Slavic system. In order to do this properly, it goes without saying that knowledge of the Slavic languages is necessary, as well as knowledge of their accent systems and their histories. For this reason, the problem is a very complicated one. Baltic is simpler. Here, Lithuanian is the most important language, but its dialects must be consulted as well. In Latvian the accent was retracted to the first syllable, but even so it still provides us with information (see below).

The fact that it is now clear that the so-called acute accent ('Stosston', 'intonation rude') developed through a following laryngeal (also if a sonant intervened), or through a voiced unaspirated consonant (i.e., a glottalized consonant; Winter-Kortlandt's law) is important; see Section 11.3.6. Here follow some examples from Lithuanian. In Lithuanian the acute accent is indicated with ´, but on sequences which were originally vocalic sonants it is indicated as *ìr*, *ùr*, etc.)

The Latvian forms are given below between parentheses. In Latvian, according to the newest insights, the situation is as follows (ˆ broken tone, ˜ sustained tone):

	unstressed	old stress	retracted stress (metatony)
acute syllable	ˆ	˜	ˋ
non-acute syllable	ˋ	ˋ	˜
in non-initial syllable we find ˜ instead of ˋ.			

Note that "retracted stress" (metatony) refers to East Baltic retractions, not to the later, specifically Latvian, general retraction of the stress to the first syllable. (The standard view is that the broken tone (ˆ) is due to retracted stress.)

sḗti (sḗt) 'to sow' < *seh$_1$-
*ḗsti (êst) 'to eat' < *h$_1$ed-
vémti (veↄ̃t) 'to vomit' < *uemh$_1$-
mélžiu 'I milk' < *h$_2$melǵ-
ìrti (iↄ̃t) 'to row' < *h$_1$r̥h$_1$-
šìrd-į acc. sg. (siↄ̂ds) 'heart' < *ḱr̥d-

A non-acute vowel, then, reflects an old long vowel (ē, ō) or a diphthong which was not followed by a laryngeal:

duktḗ 'daughter' < *d^{h}ugh$_2$tēr
peñktas (pìekts) 'fifth' < *penk^{w}tos
šiↄ̃tas (sìmts) 'hundred' < *ḱm̥tóm

The unaccented syllables in Baltic also had an acute or non-acute intonation. This explains **De Saussure's law**: a non-acute accent shifts toward the following syllable if that one is acute, for example *rañkā (cf. gen. rañkos) > *rankā́ (> rankà with a shortening of the acute vowel in the final syllable: **Leskien's law**). The ending was originally -eh$_2$ and thus acute. A laryngeal between vowels disappeared before acute intonation developed as such, e.g. gen. sg. galvõs < *-eh$_2$es.

In Russian the difference between the acute and the non-acute group of vowel + sonant sometimes still continues to exist (depending on the accent-paradigm) in the so-called 'polnoglasie' forms. This is the name given to the development eR > eRe before consonant: er, or, el and ol become, respectively, ere, oro, ele/olo and olo. The place of the stress depends on the earlier intonation: éRe etc. results from the non-acute forms, but eRé from the acute ones. For example:

PIE *g^{h}ord^{h}os: Lith. gařdas, Russ. górod 'city' (OCS gradъ)
PIE *ḱolh$_2$mos: Latv. saↃ̃ms, Russ. solóma 'reed'

As we have already seen (Section 11.8.5), the same opposition survives in Serbo-Croatian in the accentuation r̃ (acute) as opposed to, for example, r, etc.

A common development of Balto-Slavic was **Hirt's law**: the accent is retracted toward the preceding syllable if the vowel of that syllable is directly followed by a laryngeal. For example:

PIE *d^{h}uHmós 'smoke': Skt. dhūmá-, Gr. thūmós, Lith. dū́mai, Latv. dūmi
PIE *plHnós 'full': Skt. pūrṇá-, Lith. pìlnas, Latv. piↃ̃ns

This retraction of the accent took place, then, before the Latvian developments summarized above.

For an evaluation of the Balto-Slavic accent it is necessary to take the accent paradigm (AP) into account. In Lithuanian all nouns belong to one of two AP's (1 and 3). Each had a variant which is explained by De Saussure's law (2 and 4). The (monosyllabic) root was non-acute in the cases of 2 and 4; in the cases of 1 and 3 the root was thus an acute one. AP 1 always had the accent on the root, while in 3 the accent was mobile. Compare (the forms in parentheses are identical to those of 1 and 3, respectively):

	1	2	3	4
nom. sg.	*líepa*	*rankà*	*galvà*	(*žiemà*)
gen. sg.	*líepos*	(*rañkos*)	*galvõs*	(*žiemõs*)
nom. pl.	*líepos*	(*rañkos*)	*gálvos*	(*žiẽmos*)
acc. pl.	*líepas*	*rankàs*	*gálvas*	*žiemàs*

Proto-Slavic had three AP's (*a*, *b*, *c*). AP *a* had a fixed accent, usually an acute accent on the first syllable. AP *b* came out of AP *a*. (This type has a non-acute root.) AP *c* has a mobile accent; it falls on the first syllable (which is always circumflex) or on the last syllable. In Slavic AP *c* the acute intonation of the root was replaced by the non-acute: **Meillet's law**.

The Balto-Slavic types correspond as follows:

BSl. A: fixed accent   Lith. 1 (2) — Slav. *a* (*b.*) (< PIE barytone nouns)
BSl. B: mobile accent   Lith. 3 (4) — Slav. *c*   (< PIE oxytone nouns)

Types A and B go back to accent types which in Sanskrit and Greek had initial (barytone) and final accent (oxytone), respectively:

A	B	A	B	B
Skt. *svásā*	*pitā́*	Gr. *dṓtōr*	*patḗr*	*poimḗn*
svásāram	*pitáram*	*dṓtora*	*patéra*	*poiména*
svásre	*pitré*	*dṓtoros*	*patrós*	*poiménos*

The mobile paradigm of Balto-Slavic developed due to a number of different shifts that took place. (This type had a more complex PIE paradigm to begin with: cf. the two variants Gr. *patḗr*, *poimḗn*.)

As stated, the individual languages of the Slavic group underwent countless developments, but also during the Proto-Slavic period a number of phonetic as well as morphological developments took place. Because of this, it is very hard to evaluate the situation properly.

11.9.5 PIE a tone language?

Much still remains unexplained, despite all that we have seen so far. It is generally agreed that in a certain phase most of the nouns had a mobile accent which caused a zero-grade when the syllable was unaccented; compare, for example, the ablaut in nom. *$g^wém$-ti-s*, gen. *g^wm-téi-s*. By means of leveling, this may give rise to words which always had full-grade or zero-grade in the root, and always an initial or final accent. It is, however, impossible to indicate under what specific conditions one or the other development took place: why does Sanskrit have *júṣṭi-*, but *śruṣṭí-*? It is also not the case that the initial accent goes together with a full-grade of the root; we find Skt. *gáti-* < *g^wmti-*, and *tantí-*, while we would expect to see **gatí-* and **tánti-*.

Moreover, the accent system of both Sanskrit and Greek is neither a stress-accent nor that of a tone language, but something in between. The question can therefore be asked as to whether these systems took their development from a tone language. A number of different indicators all point in this direction.

In Vedic many unaccented syllables and words can follow each other, which is a phenomenon more understandable within the context of a tone language. That some particles are accented and others are not (*íd*, *hí*: *cid*, *vā*) is understandable if they had a high and low tone respectively, but it is otherwise difficult to understand.

The Russian scholar, Dybo, has ascertained that the Balto-Slavic accent of derived nouns can be explained if one assumes that roots and suffixes either had a high tone or a low tone, and if it is also assumed that the first high tone received the stress.

A completely different consideration is based on some limitations in the structure of the Indo-European root: a voiceless and a (voiced) aspirated stop cannot co-occur in the same root; thus *$teub^h$-* and *b^heut-* are excluded. This is understandable if the voiceless consonant caused a high tone and the aspirated consonant caused a low tone. (That consonants influence the tone is normal.) The combination is, thus, impossible.

Recent research has demonstrated that the root-structure determined the accentuation. If there was a stop in the root, then a voiceless one (adjacent to a vowel) had another effect than a voiced (glottalized) or an aspirated one. Probably the voiceless sound caused a high tone, and both of the other sounds caused a low tone.

There are several indications that Proto-Indo-European was a tone language at some time in its development. The accent systems of both Sanskrit and Greek already give reason enough to surmise that this may have been the case. There are, however, a great number of problems, among which is the question of how this may relate to the development of the ablaut (see Section 12.3).

Repetition exercises

Exercise 17

Reconstruct the PIE preforms of the bold-faced forms. Posit a single preform for each entry:

a. Skt. **táp**-*ati* 'warms', Lat. **tep**-*ēre* 'to be warm', OCS **tep**-*lostъ* 'warmth'
b. Skt. **śákr̥**-*t*, Gr. **kópr**-*os* 'excrement'
c. Skt. **jámbh-a**- 'tooth', Gr. **gómph-os** 'pin', OCS **zǫb-ъ** 'tooth'
d. Lith. **áug**-*ti*, Goth. **auk**-*an* 'to grow', Lat. **auc**-*tor* 'seller'
e. Skt. **bāhús**, Gr. **pēkhus**, Aeol., Dor. **pãkhus**, Olc. **bōgr** 'arm'
f. Av. **bar**-*āmi,* Gr. **phér**-*ō*, Lat. **fer**-*ō*, OIr. **bir**-*u* 'I carry'
g. Skt. **gā́m** (acc.sg.), Gr. (Dor.) **bõn** (acc.sg.), Umbrian **bum** (acc.sg.) 'cow'
h. Gr. **pérd**-*ō*, OHG **ferz**-*an*, Russ. **perd**-*ét* 'to fart'
i. Goth. **sok**-*jan* 'to seek', Gr. **hēg**-*éomai* 'to lead the way', Lat. **sāg**-*us* 'prophetic'
j. Skt. **bándh-u**- 'relative', Gr. **penth-erós** 'father-in-law', E. **bind**
k. Hitt. **kuen**-*zi*, Skt. **hán**-*ti* 'kills', Lat. *of-***fen**-*d-ō* 'to strike against'
l. Skt. **drógh-a**- 'deceitful', OP **draug-a**- 'deceit', Olc. **draug-r** 'ghost'
m. Skt. **áśva-**, Lat. **equu-s** 'horse', Goth. **aihwa**-*tundi* 'thornbush' (lit. 'horse-tooth')
n. Lat. **host**-*is* 'stranger, enemy', Goth. **gast-s**, OCS **gost-ъ** 'guest'
o. Skt. **kṣití-**, Av. **šiti-**, Gr. **ktísi-s** 'settlement'
p. Lat. **torp**-*eō* 'to be numb', Lith. **tir̃p**-*ti* 'to coagulate', Goth. **þaurf-ts** 'necessary'

Exercise 18

Reconstruct the root and give the ablaut grades of the root for each single form:

a. Gr. **dérk**-*omai* (pres.), *dé-***dork**-*a* (pf.), *é-***drak**-*on* (aor.), Skt. *da-***dárś**-*a* (pf.) 'to look'
b. Goth. **beit**-*an* 'to bite', OE **bit-a** 'a bit', Goth. **bait-rs** 'bitter', Skt. **bhed-á**- 'breaker'
c. Skt. **budh**-*ánta* (3pl. med. aor. subj.), *bu-***bódh-a** (pf.) 'to perceive', Goth. *faur-***biud-an** 'to forbid', OE *ge-***bod** 'order', Gr. **peúth**-*omai* 'to learn, hear', Lith. **bud**-*rùs* 'watchful'
d. Skt. **drám**-*ati* 'runs', Gr. *é-***dram**-*on* (aor.) 'ran', **dróm-os** 'walk'
e. Gr. **orég**-*ō* 'to stretch', Av. **rāz**-*aiia*- 'to make right', Skt. **r̥j**-*ú*-, Av. **ərəz**-*u*-, G. **rech**-*t* 'right'
f. Av. **vā**-ⁱ*ti*, Gr. **áē**-*si* 'to blow (of the wind)', Hitt. **huu̯-ant**- 'wind'
g. Skt. **śávī**-*ra*- (< *-*ira*-), Av. **sū**-*ra*- 'strong', Gr. *á-***kū**-*ros* 'without authority'
h. Gr. **tére**-*ssen* 'pierced', **trē**-*tós* 'pierced' (ptc.), **tor**-*eús* 'borer'
i. Lat. **ungu**-*is*, OHG **nag-al** 'nail', OCS **nog-a** 'foot'

Exercise 19

Reconstruct the PIE preform for:

a.   Skt. *matá-*, Gr. (*autó-*)*matos*, Lat. (*com-*)*mentus*, Lit. *miñtas* 'thought'
b.   Av. *hapta*, Arm. *ewt'n*, Gr. *heptá*, Lat. *septem*, OIr. *secht n-* 'seven'
c.   Skt. *mr̥ti-*, Av. *mərəti-*, Lat. *mors*, *-tis*, Lit. *mirtìs*, OCS (*sъ-*)*mrъtь* 'death'
d.   Skt. *áyas-*, Lat. *aes*, Goth. *aiz* 'metal'
e.   Skt. *árbha-* 'small', Lat. *orbus* 'orphaned', Arm. *orb* 'orphan'; cf. Gr. *orph*-*anós* 'orphan'
f.   Lit. *šlaunìs* 'hip', Lat. *clūnis*, Skt. *śróṇi-* 'buttocks'

Exercise 20

Find the Greek outcome of the following PIE forms by applying the sound laws you know. Note: PIE *i disappears between vowels, and final *$-m$ > $-n$.

a.   *$pleh_1 d^h uh_1 s$*
b.   *$g^{wh} od^h eioH$*
c.   *$d^h eug^h oH$*
d.   *$k^w elsom$*
e.   *$h_1 elnb^h os$*
f.   *$h_2 meig^w oH$*

Exercise 21

Find the Sanskrit outcome of the following PIE forms by applying the sound laws you know.

a.   *$menos$*
b.   *$k^w ek^w lo-$*
c.   *$b^h oreie$*
d.   *$d^h uHmosio$*
e.   *$nk̑rh_2 to-$*
f.   *$b^h ud^h to-$*
g.   *$lilig̑^h usiH-$*

Exercise 22

Find the Gothic outcome of the following PIE forms by applying the sound laws you know. Note: the endings *-os* and *-is* become -s, the ending *-om* is dropped entirely.

a.   *gʷṃtis*
b.   *pelu*
c.   *léikʷonom*
d.   *goltós*

Exercise 23

Provide the correct outcome of the PIE forms as requested:

a.   PIE *nébʰos* >   Greek …
                          Avestan …
b.   PIE *ǵustis* >   Sanskrit …
                          Gothic …
c.   PIE *prh₃mos* >   Latin …
                          Lithuanian …
d.   PIE *troud-* >   Latin …
                          Gothic …
                          OCS …

11.10 From Proto-Indo-European to English

In this section, a concise survey is presented of the major developments of Proto-Indo-European to Present-Day English. In view of the complexity of some changes the survey has necessarily been simplified.

11.10.1 The consonants

The most important changes have taken place in the period preceding Old English. A blank between Proto-Germanic and English indicates that no change took place. For the phonetic symbols see the section on phonetics at the end of this book.

PIE	PGmc.	WGmc.	OE	ME	ModE
p	*f, b*[1]		*f,* [*v*][2]	*f, v*	*f, v*
t	*þ, d*[1]		*þ,* [*ð*][2]*, d*		*th* [θ/ð]
k	*χ, g*[1]		*h,* Ø		*h,* Ø
k^w	*χ^w, g^w1*		*χw,* Ø	*h,*[4] *w,* Ø	*h, w, wh* [ʍ][5]
b	*p*				*þ*
d	*t*				*t*
g	*k*		*k, č*[3]		*k, ch* [č]
g^w	*k^w*				*kw, k*
b^h	*b*		*b,* [*v*][2]	*b, v*	*b, v*
d^h	*d*		*d,* [*ð*][2]	*d*	*d*
g^h	*g*		*g, γ*[2]*, y*[3]		*g, y*
g^wh	*g^w*	*g, w*			*g, w*
s	*s*[1]		*s,* [*z*][2]		*s,* [*z*]
	z[1]	*r*			*r*
H	*a,* Ø (see vowels)				
r, l, m, n					*r, l, m, n*
i, u					*y, w*

1. *p, t, k* remain unshifted after *s*; *b, d, g, g^w, z* except initially and after PIE stress (Verner's Law); for details see Section 11.3.8.
2. *b, d, g* initially and after nasal, *v, ð, γ* elsewhere; in Old English the allophones *v, ð* and *z* were not expressed in writing.
3. *č, y* before front vowels (*y* as in E *yoke*)
4. *h* before rounded vowel
5. voiceless labial-velar fricative, as in Scottish English

Some examples and additions (unless otherwise mentioned reconstructed forms are Proto-Indo-European)

PIE **p*   > *f, v*: *foot* < **pōd-*; *father* < **ph₂tḗr*; *over* < **uper*; *seven* (cf. Goth. *sibun*, Lat. *septem*)

PIE **t*   > *þ, ð*: *three* < **treies*; *brother* < **bʰréh₂tēr* (Skt. *bhrắtar-*)

PIE **k*   > *χ* > *h-* before vowel: *horn* < **kṛn-* (Lat. *cornū*)

lost before *r, l, n*, between vowels, and finally: *ring* < OE *hring* < PGmc **χrengaz*; *lean* < OE *hlēonan* (cf. Lat. *(in)clīnāre*); *slay* < OE *slēan* < PGmc **slaχan-*; *high* < OE *hēah* < PGmc **χauχa-*

χs > *ks*: *ox* < OE *oxa* < PGmc **oχsan-* < **uksḗn* (Skt. *ukṣắ*)

χt > *t*: *eight* < OE *eahta* < **oḱtōu* (Skt. *aṣṭáu*)

χj > χχ > f: *laugh* < OE *hlæhhan* < PGmc *χlaχjan-*

PIE *kʷ*   > χw > w, [ʍ]: *what* < OE *hwæt* < PGmc *χwat* < *kʷod*; lost between vowels: *Ewood* (place-name "water-wood") < OE *ēa-* < *aχwa* (cf. Lat. *aqua*); *see* < OE *sēon* < PGmc *seχʷanan* (cf. Goth. *saihwan*, Lat. *sequor*); lost before *t*: *night* < OE *neaht* < PGmc *naχt-* < *nokʷt-*; bilabial element lost before rounded back vowel: *who* < OE *hwā* < PGmc *χwaz* < *kʷos*

PIE *b*   > p: *apple* < OE *æppel* < PGmc *apla-* < *h₂ebl-* (cf. Russ. *jábloko*)

PIE *d*   > t: *two* < *dṷoi-*; *foot* < *pōd-*

PIE *g*   > k: *yoke* < *(H)iugom* (cf. Lat. *iugum*); *chin* < OE *ċinn* < WGmc *kinn-* < PGmc *kenw-* < *ǵenw* (cf. Gr. *génus* 'lower jaw')

PIE *gʷ*   > kʷ: *queen* < *gʷēn-* (cf. Goth. *qens*); cf. OE *cwōmon* 'came (pl.)' < *gʷēm-*
> k- before (Gmc) rounded vowel: *come* < Gmc *kʷum-* < *gʷṃ*
> k: *sink* (cf. Goth. *sigqan*)

PIE *bʰ*   > b: *brother* < *bʰréh₂tēr*; *bind* < *bʰendʰ-* (Skt. *bandh-*)
> v: *give* < *gʰebʰ-* (cf. Goth. *giban*)

PIE *dʰ*   > d: *daughter* < *dʰugh₂tēr*; *door* < OE *duru* < *dʰur-* (cf. Gr. *thúrā*)

PIE *gʰ*   > g: *girdle* < OE *gyrdel* < PGmc *gurd-ilō* < *gʰrdʰ-*
> ng [ŋg] > ŋ: *tongue* < *dṇgʰṷ*; Gmc g (from *gʰ*) was palatalized if preceded or followed by a front-vowel: *way* < OE *weġ* < *wégʰ-*; *may* < OE *mæġ* < *magʰ-*; *yard* < OE *ġeard* < *gʰerdʰ-* (cf. Goth. *(bi)gaírd*)

PIE *gʷh*   > gʷ > g: *sing* < *sengʷh-* (cf. Gr. *omphḗ* 'voice' < *songʷh-eh₂-*)
> w: *snow* < *snoigʷhos*

PIE *s*   > s: *sing* (see previous item)
> z: *choose* < *ǵeus-*
> z > r: *were* < OE *wǣron* < PGmc *wēzum* from PIE root *h₂ues-*; *frore* (dial.) 'frozen' < *frus-*
sk > sh: *show* < PGmc *skauwōjan-* (cf. Gr. *thuo-skóos* 'priest' < 'observing the sacrifice'); *shire* < *skeir-* (cf. OHG *sciaro*); *fish* < *piskis* occasionaly sk > ks: *(be)twixt* < *dṷisk-* (cf. G *zwischen*)

PIE *r, l*   remained unchanged

PIE *m, n*   disappeared before voiceless fricatives: *wish* < OE *wȳscan* < PGmc *wunsk-* < *uṇHsk-* (cf. G *Wunsch*); *five* < *penkʷe* (cf. Goth. *fimf*)

PIE *i*   = y: *yoke* < *(H)iugom*

PIE *u*   = w: *work* < *ṷerǵ-*

11.10.2 The vowels

Blanks appear when no changes occurred between Proto-Germanic and Modern English.

PIE	PGmc	WGmc	OE	ME	ModE
h₂	Ø				
	a		*o+N*	*a/o+N*	[*æN, ōN*]
			a, æ	*a*	[*æ, aɪ, ē*]
h₂e, o	*a*	as above			
e	*e*[1]				*e*
i	*i*[2]				*i*
u	*u*		*u, o*		ʌ
			y[3]		*i*
	o[4]				*o*
ō	*ō*		*ō, ē*[5]	*ō, ē*	*ū, ī*
eh₂	*ō*		*ō, ē*[5]	*ō, ē*	*ū, ī*
ē	*ē*	*ǣ*	*ǣ, ō*[6]	*ē, ō*	*ī, ū*
iH	*ī*				[*aɪ*]
uH	*ū*				[*au*]
ei	*ī*				*aɪ*
	ē₂[7]				
oi	*ai*		*ā*	*ǭ*	*ō*
			ǣ[8]	*ę̄*	*ē* (17th c.), *ī*
eu	*eo,* (*iu*[8])		*ēo*	*ē*	*ī*
ou	*au*		*ēa*	*ē*	*ī*
R̥[9]	*uR* (see PGmc *u*)				(*oR*)

1. *i* by *i*-mutation   4.   *o* by *a*-mutation   7. by *a*-mutation

2. *e* by *a*-mutation   5.   *ē* by *i*-mutation   8. (followed) by *i*-mutation

3. *y* by *i*-mutation (OE *y* = *ü*)   6.   *ō* before nasals   9. R = *r, l, m, n*

Lengthening and shortening

In Early Middle English (1100–1300) (a) short vowels tended to be lengthened in open syllables and before *ld*, *nd*, *mb*, while (b) long vowels were often shortened in polysyllabic words or before certain consonant clusters, for example:

lengthening:

> *a > ā* (OE *noma* — ME *nāme*); *i, e > ē* (OE *wicu* — ME *wēke* 'week', OE *etan* — ME *ēte* 'eat'; *o > ǭ* (OE *nosu* — ME *nǭse*).

> OE *cild* — ME *cīld*; OE *gold* — ME *gǭld*; OE *hund* — ME *hūnd*; OE *blind* — ME *blīnd*; OE *comb* — ME *cǭmb*

shortening:

cf. *holy* vs. *hŏliday*; *child* vs. *chĭldren*; *keep* vs. *kĕpt*; *dream* vs. *drĕămt*

The Great Vowel Shift

In the course of the fifteenth century, the long vowels underwent a dramatic change, a process known as the Great Vowel Shift. The GVS caused the high vowels *ī* and *ū* to become diphthongs, and raised all the other long vowels in the vowel system. It is especially this change that has caused the disparity between the spelling of English and its pronunciation.

Great Vowel Shift and After

ME	Chaucer		Shakespeare	Now
ī	[fi:f]	*five*	[fəiv]	[faɪv]
ē	[me:d]	*meed*	[mi:d]	[mi:d]
ɛ̄	[klɛ:n]	*clean*	[kle:n]	[kli:n]
ā	[na:m]	*name*	[nɛ:m]	[ne:m]
ǭ	[gɔ:t]	*goat*	[go:t]	[go:t]
ọ̄	[ro:t]	*root*	[ru:t]	[ru:t]
ū	[du:n]	*down*	[dəun]	[davn]

Some examples and additions:

PIE *$*h_2$ > Ø: *daughter* < OE *dohtor* < *$*d^hugh_2t\acute{e}r$
　　　　> *ā*: *father* < OE *fæder* < *$*ph_2t\acute{e}r$
PIE *$*h_2e$ > *ē*: *acre* < OE *æcer* < Gmc *$*akraz$ < *$*h_2e\acute{g}ros$ (cf. Lat. *ager*)
PIE *$*o$　> *ō*: *comb* < OE *comb/camb* < PGmc *$*kambaz$ < *$*gomb^hos$ (cf. Gr. *gómphos*)
　　　　> [aɪ]: *night* < OE *niht* < *$*nok^wt$- (OE generalized the *i*-mutated vowel, beside 'normal' *neaht*; so too *might*, cf. G *Macht*)
　　　　> *ē*: *eight* < OE *eahta* < PGmc *$*a\chi t\bar{o}$ < *$*o\acute{k}t\bar{o}u$
PIE *$*e$　> e: *melt* < OE *meltan* < PGmc *$*maltjan$ < *$*mold$-
　　　　> *ī*: *eat* < ME *ēte(n)* (lengthening) < OE *etan* (cf. Lat. *edō*)
PIE *$*i$　> [ɪ]: *fish* < *$*pisk$-
　　　　> e: (*a*-mutation): *nest* < *$*nisdo$-
　　　　> *ī*: *beetle* < OE *bitula* < *$*b^hid^h$-
　　　　> [aɪ] in monosyllables: *my* < Gmc *$*miz$; *by* < OE *bi* < *$*b^hi$
PIE *$*u$　> [ʌ]: *son* < OE *sunu*
　　　　> [ɪ]: *fill* < OE *fyllan* (*i*-mutation) < PGmc *$*fulljan$ < *$*plH$-
　　　　> *ō* (lengthening in open syllable): *over* < *$*uper$ (OHG *ubir*, Skt. *upári*)
PIE *$*R̥$　> uR > /ʌR/: *un-* < *$*n̥$-; *us* < OE *ūs* < PGmc *$*uns$ < *$*n̥s$
PIE *$*ọ̄$　> *ū*: *foot* < OE *fōt* < *$*pōd$-

              > *ī*: *feet* (pl.) < PGmc **fōtiz*

PIE **eh₂*   > *ī*: *beech* < OE *bēċe* (*i*-mutation) < PGmc **bōkiōn* (cf. Lat. *fāgus*)

              > /ʌ/ (shortening): *brother* < OE *brōþor* < **bʰréh₂tēr*

PIE **ē*   > *ī*: *seed* < OE *sǣd* < **seh₁*- (cf. Lat. *sēmen*)

              > /ʌ/: *month* (shortening) < OE *mōnaþ* < **meh₁n*-

PIE **iH*   > /aɪ/: *swine* < OE *swīn* < **suH-iHno*- (cf. Lat. *suīnus*)

PIE **uH*   > /aʊ/: *mouse* < OE *mūs* < **muHs*

PIE **ei*   > /aɪ/: *bite* < OE *bītan* < **bʰeidʰ*-

PIE **oi*   > *ō*: *home* < OE *hām* < PGmc **haimaz* < **koim*- (cf. Gr. *koimáō* 'go to sleep')

              > *ī*: *reach* < OE *rǣċan* < PGmc **raikjan*

              occasionally *ū*: *two* < OE *twā* < **du̯oi*

PIE **eu*   > *ī*: *freeze* < OE *frēosan* < **preus*-; *steer* < OE *stīeran* (*i*-mutation) < Gmc **stiurjan*

              > *ū*: *choose* < ME *chōsen* (with incidental shift of accent) < OE *ċēosan* < **ǵeus*- (Skt. *jóṣati*, Gr. *geúomai*); similarly *lose* < OE *lēosan* < **leus*-

PIE **ou*   > *ī*: *ear* < OE *ēare* < PGmc **aurōn*- < **ous* (exceptional developments of PIE **ou* in *death*, *great*, *high*, *red*)

Morphology

Chapter 12

Introduction

12.1　The structure of the morphemes

A word in PIE consists of a root, often a suffix, and usually an ending. For comparison: E. *singers* has a root *sing-*, a suffix *-er-*, and an ending, *-s.*

12.1.1　The root

Each PIE root begins and ends with one or two consonants: (*C*)*CeC*(*C*); for example, **ped-* 'foot', **steigʰ-* 'to walk' (the *i* should be seen as a consonant). An *s-* or a laryngeal may precede the initial consonant: **streu-* 'sprinkle'. The vowel *-e-* in these notations represents the ablaut series *e/o/Ø/ē/ō.*

Apparent roots in VC- had HVC- (**h₁ed-* 'to eat'), those ending in a long vowel had **-eH* (**stā-* = **steh₂-*). The presence of **H-* before initial *VC-* cannot be proved for all cases, especially for **h₁-*, but it can for some. On the basis of a comparison with languages that have an obligatory prevocalic glottal stop, we reconstruct **HVC-* for PIE.

PIE probably did not have **r-* in anlaut. Apparent cases had **Hr-*.

Roots which ended in laryngeals after a consonant are sometimes called disyllabic roots, because, for example, **ḱerh₂-* 'to mix' became *kera-* in Greek. In PIE, however, they were always monosyllabic. It was Émile Benveniste who first saw that the laryngeal theory implies that all roots have the same structure.

Many roots are known in a short form and in a longer one, for example **ǵʰeu-* 'to pour (as into a mold)', (Gr. *khéō*) next to **ǵʰeud-* (Goth. *giutan*, OE *gēotan*, Lat. *fu-n-d-ō*). The *-d-* is called a 'root enlargment'. Originally, such an additional element would have had a specific meaning, but its meaning can no longer be recovered.

The consonants usually display a decreasing sonority, forward as well as backward, counting from the vowel. Thus **prek-* is a possible root form, but ***peḱr* is not possible since *r* is more sonorous than **ḱ*. A seeming exception are the roots in *-i* (more rarely in *-u*), for example **peh₃i-* 'to drink'; but here, *-i-* did not originally form part of the root but was a suffix, **peh₃-i-* (see 11.7.2).

There are a few restrictions which apply to the kind of consonants which can be combined in one root. Two voiced consonants (for example, ***deg-*) are not tolerated, just as unvoiced + aspirated are impossible (neither ***tegʰ-* nor ***dʰek-*; see 11.10.6). An exception applies to roots in initial *s-*, such as **steigʰ-*.

12.1.2   The suffixes

Nominal suffixes usually have the structure *eC* or *CeC*, which is to say that a consonant follows the vowel, and one can precede it. The vowel displays ablaut: *e/o/Ø/ē/ō*, for example: *-en-/-on-/-n-/-ēn-/-ōn-*; *-ter-/-tor-*, etc. PIE *-no-*, *-mno-*, *-tero-* etc. are also referred to as suffixes, but it would be better to speak of the suffixes *-n-*, *-mn-*, *-ter-* (with *o*-inflection).

   More complicated forms are fairly rare. Usually they have no vowel: *-iHn-*, *-mh$_1$n-*, *-tuh$_2$t-*. These forms have originated from two or more suffixes (*-i-Hn-*, *-m-h$_1$n-*, *-tu-h$_2$-t-*).

   Suffixes with two consonants following the vowel always ended in *-t*: *-ent-*, *-uent-*. The reason for this restriction is not yet clear. There are just a few verbal suffixes: *-ei-/-i-*, *-eh$_1$-*, *-sk-*.

12.1.3   The endings

Nominal endings have the form *eC*: nom. pl. *-es*, gen. sg. *-os/-s*. Some have no ablaut vowel: *-b^{h}i*, *-su*.

   Verbal endings often have the form *-Ce*: 1 pl. *-me*, 2 pl. *-te*, 1 sg. pf. *-h$_2$e*. The forms *-CCe* (2 sg. pf. *-th$_2$e*) and *-V* (3 sg. med. *-o*) are also found. We find the same structure in the pronouns. But the form *-CeC* (1 pl. *-mes*) also occurs. Forms of the type *eC* are only found in the 3 pl.: *-ent*, pf. *-ēr*.

12.1.4   Pronouns, particles, etc.

Alongside *CeC* (**h$_1$eǵ-* 'I') we often find the structure (*C*)*Ce*: *so 'this', **h$_1$me* 'me', **k^{w}e* 'and', *ne* 'not'.

12.1.5   Pre- and infixes

The *s*-mobile as well as the augment can be seen as prefixes. We call *s*-mobile an initial *s-* which can be present or absent in the same root, as in Gr. aor. 3 sg. *(s)kédas(s)e* 'he sprinkled'. Alongside Skt. *páśyati* 'to see' we have Skt. *spáś-* 'spy', Av. *spasiieiti*, Lat. *speciō*. There are many such examples, but the meaning of **s-* is unclear.

   The augment, **h$_1$e-*, indicated the past tense: Gr. *é-pheron* 'I wore', Skt. *á-bharam*, Arm. *e-ber*.

   There is only one infix, the **-n-* in presents: Lat. *iung-ō*, 'to tie together', Skt. *yuñj-* < **(H)iu-n-g-*; cf. Lat. *iugum* 'yoke' < **(H)iug-om*.

12.1.6 Word types

There are verbal and nominal forms. The verbal forms will be examined in Chapter 18. The nouns can be subdivided as follows:

1. the substantive;
2. the adjective. The adjective has separate forms for (the nom. acc. of) the neuter and often also for the feminine. The declension is almost completely the same as that of the substantive;
3. the pronouns, which have special endings;
4. the numerals; only the first four are declined;
5. indeclinable words:
   a. the numerals higher than 'four' (see above);
   b. adverbs. Adverbs were derived from adjectives in different ways. They are often a form of an adjective or substantive, but we can no longer determine this in the case of the oldest of them;
   c. negations, such as **ne* 'not';
   d. particles, for example **ǵʰi* 'for, indeed';
   e. conjunctions: **-kʷe* 'and', **-ue* 'or';
   f. interjections (**ai* = **h₂ei*?).

PIE did not have preverbs or pre- or postpositions, only adverbs (which became preverbs, etc., in the individual languages).

Exercise 24

Which of the following theoretical PIE roots do not violate any of the restrictions on the PIE root structure?

a. **mer-*
b. **tues-*
c. **etekʷ-*
d. **bʰet-*
e. **h₃reǵ-*
f. **bleu-*
g. **ged-*
h. **ǵnesl-*
i. **rpelḱ-*
j. **sieh₁-*

12.2   Ablaut

12.2.1   Introduction

Ablaut (from German *Abstufung der Laute*; vowel alternation) is the alternation between *e*/*o*/Ø/*ē*/*ō*. The difference between *e* and *o* (and between *ē* and *ō*) is called qualitative ablaut, whereas that between *e*, Ø and *ē* (and between *o*, Ø and *ō*) is called quantitative ablaut. Other terms are:

e	*o*	full grade	(*guṇa*, Voll-/Hochstufe, degré plein);
ē	*ō*	lengthened grade	(*vṛddhi*, Dehnstufe, degré long);
Ø		zero grade	(Null-/Schwundstufe, degré zéro).

Guṇa and *vṛddhi* are the terms employed by the old Indian grammarians.

12.2.2   The normal series

A few examples of the normal series:

b^heid^h-	Gr.	*peíth-omai*	*pé-poith-a*	*e-pith-ómēn*
'to persuade'	Lat.	*fīd-ō*	*foed-us*	*fīd-ēs*
$steig^h$-	Gr.	*steíkh-ō*	*stoĩkh-os*	*é-stikh-on*
'to walk'	Goth.	*steig-an*	*staig*	*stig-um*
	OE	*stīgan*	*stāg*	*stīgen*
	Lith.	*steĩg-ti*	Latv. *staiga*	
derḱ-	Gr.	*dérk-omai*	*dé-dork-a*	*é-drak-on*
'to see'	Skt.	*á-darś-am*	*dá-darś-a*	*a-dṛś-ran*
suep-	OIc.	*svef-n*	Lith. *sãp-nas*	OCS *sъ-nъ*
'sleep'				Gr. *húp-nos*

In 'sleep' the Lithuanian form lost the *-u-*. Skt. *svápnas* and Lat. *somnus* could have had *e* or *o*. In this last case, where one of the sonants *i*, *u* standing before *e*, *o*, became vocalic in the zero grade, the term *samprasāraṇa* is used.

12.2.3   Ablaut with laryngeals

The coloring of *e* by *h_2* and *h_3*, the lengthening of the vowel and the vocalization or the disappearance of the laryngeal in the zero grade, often changed the form of the ablaut *e*/*o*/Ø:

Laryngeal before *e/o/Ø*:

*$h_2e\acute{g}$- 'to lead'	*$h_2o\acute{g}$-	*$h_2\acute{g}$-
Gr. *ágō*, Lat. *agō*	Gr. *ógmos* 'swathe'	Lat. *gerō* < *$h_2\acute{g}$-es-
*h_2eug- 'to increase'		*h_2ug-
Lat. *augeō*, Skt. *ójas-*		*ugrá-*
*h_2ei-*u* 'a long time'	*h_2oi-*u*-	*h_2i-(*eu*-)
Lat. *aevum*	Skt. *ā́yu*, Av. *āiiu*	Av. gen. *yaoš*

Laryngeal after a vowel gave:

$$eh_1 \ / \ oh_1 \ / \ h_1 \quad > \quad \bar{e} \ / \ \bar{o} \ / \ h_1$$
$$eh_2 \ / \ oh_2 \ / \ h_2 \quad > \quad \bar{a} \ / \ \bar{o} \ / \ h_2$$
$$eh_3 \ / \ oh_3 \ / \ h_3 \quad > \quad \bar{o} \ / \ \bar{o} \ / \ h_3$$

*d^heh_1-	*d^hoh_1-	*d^hh_1-
Gr. *títhēmi*	*thōmós* 'heap'	*títhemen* (1pl.)

Roots in *-*VH* followed by *i* present a problem in the zero grade: *ph_3i- from *peh_3i-gave Skt. *pītá-*. Probably *$ph_3itó$- first became *$pih_3tó$- through metathesis.

We find laryngeal after sonant in roots of the type *$TeRH$-. The zero grade *RH gave rise to exceptional phonetic developments (Section 11.9.5):

> *$temh_1$- 'to cut': Gr. *témenos* 'temple grounds' (< 'cut off piece of land')
> *$tomh_1$-: Gr. *tómos* 'slice'
> *tmh_1-: Gr. *tmētós* 'cut, sliced'
> *$\acute{g}^heuH$- 'to call': Skt. *hávī-tave*; *háv-ate*; OCS *zovǫ* (*ov* < *eu*)
> *$\acute{g}^huH$-: Skt. *hūtá-*; ptc. *huv-ant-*; OCS *zъv-ati* (-*v*- is an automatic glide)

12.2.4 The place of the full grade

The full (or lengthened) grade is usually placed between the first and second conso-nant of the root, not counting initial *sC- or an initial laryngeal in a root of four or more consonants. Roots in *sTr/l- often have the *e*-grade after the third consonant. Thus we find:

> *h_1d- → *h_1ed-, *sm- → *sem-, *$t\acute{k}$- → *$to\acute{k}$-, *ut- → *$u\bar{e}t$-, etc.
> *dmh_2- → *$demh_2$-, *lis- > *$lois$-, *prt- → *$pert$-, *$sp\acute{k}$- → *$spe\acute{k}$-, *h_3lh_1- → *h_3olh_1-, etc.
> *$strh_3$- → *$sterh_3$-, *h_2mrd- → *h_2mord-, *$strig$- → *$streig$-, etc.

There are also exceptions to this rule, e.g. *sup- → *$suep$-, *$suop$- 'sleep' (never **$seup$-), *$pre\acute{k}$- 'ask'.

12.2.5   The function of the ablaut

Naturally, each morphological form had its own fixed ablaut form. The original distribution of the ablaut forms is not always easy to retrieve, because the individual languages have strongly reduced the alternations. The details are given in Chapters 13 to 18. Here are some examples:

> thematic presents usually had *e*-vocalism in the root: **bʰer-e* 'he carries';
> the perfect tense had *-o-* in the singular: **uoid-e* 'he knows';
> the verbal adjectives in *-to-* had zero grade of the root: **gʷʰn-tós* 'killed'.

The lengthened grade was only found in a restricted number of forms:

1. the nom. sg. of root nouns: **uōkʷs* 'voice', **ḱērd* 'heart';
2. nominal derivatives (originally from roots): **suēḱuro-* 'brother-in-law';
3. the (ind. act. of the) s-aorist: **uēǵʰ-s-* 'to drive';
4. the 'static' presents: Skt. *tā́ṣṭi* 'he does carpentry', *-staut* 'he praised' < **-stēut*;
5. the nom. sg. of the hysterodynamic inflection (see 13.2.4): **ph₂tḗr*, **h₂éḱmōn* 'stone';
6. the loc. sg. of the proterodynamic inflection (see 13.2.4), for example **-ēu*;
7. the ending 3 pl. pf. *-ēr*.

Exercise 25

Put the following roots (given in the zero grade) in the required ablaut grade as given between brackets:

a.	**tḱ-*	(o)	d.	**h₁es-*	(o)	g.	**tnt-*	(e)
b.	**lis-*	(e)	e.	**stiǵʰ-*	(Ø)	h.	**suep-*	(ō)
c.	**perk-*	(Ø)	f.	**dʰu-*	(ē)	i.	**striH-*	(e)

12.3   **The origin of the ablaut**

There are many indications that the alternation *e*/Ø was originally dependent on the accent, compare:

*ḱléu-os	Skt. *śráv-as*	Gr. *klé-os*
*ḱlu-tós	Skt. *śru-tás*	Gr. *klu-tós*
*h₁éi-mi	Skt. *é-mi*	Gr. *eī-mi* (< **éi-mi*)
*h₁i-més	Skt *i-más*	(Gr. *í-men* for **imén*)
*ph₂tér-m	Skt. *pi-tár-am*	Gr. *pa-tér-a*
*ph₂tr-ós		Gr. *pa-tr-ós*

It follows that an unaccented morpheme either lost or never acquired the vowel *e. At a later stage but still in the PIE period this relation no longer existed, compare 2 pl. *bʰéreth₁e, Skt. *bháratha*, Gr. *phérete*.

O-vocalism, however, is also found in unaccented position; compare:
Gr. ntr. *eu-genés* 'of good descent': *génos*
Gr. (*do*)-*tér*: (*dṓ*)-*tōr* 'giver'

It seems as if both the zero grade and the *o*-grade were found in unaccented position. This situation may be explained by the following scenario. At an early stage (in a period preceding what we call PIE) accented morphemes had *é whereas unaccented morphemes had Ø. Some time later a full vowel could be introduced in the original zero grade, but it could not be *e; instead, it automatically became -*o*-:

nom. *mén-os for older **mén-s
gen. *(men-)és-os for older **(mn)-és-s

From cases such as the genitive (*mn-és-s) the vowel of the suffix (*e*) was taken over by the nominative (*mén-s), where it became -*o*- (in -*os*).

It is now possible to distinguish between three stages in the ablaut system:

	stressed	**unstressed**
1. zero phase:	*é* (*ó*)	- Ø
2. *o*-phase:	*é* (*ó*)	- Ø, *o*
3. *e*-phase:	*é* (*ó*)	- Ø, *o*, *e*

The lengthened grade perhaps originated from vowel lengthening in monosyllables (see nr. 1–4 of Section 12.2.5), and in final syllables before sonants (*r*, *l*, *n*, *i*, *u*; probably not before *m*; nr. 5–7 of Section 12.2.5). Both developments have parallels in other languages. Note that the long vowel which arose from the contraction of short vowels, as in the dative sg. of the *o*-stems (-*ōi* < -*o* + *ei*), probably did not yet exist in PIE, where the form still was *-*oHei*.

The collective operation of these rules can be seen in the nominative of the *CéC-ōR* type (*déh₃-tōr, Gr. *dṓtōr*). As the most original type one would expect *CéC-R, with a zero-grade suffix -R after accented *é*; there are still some traces of it. From the accusative *CC-éR-m a vowel, which became -*o*-, was introduced in the suffix of the nominative (*CéC-oR) and was consequently lengthened (*CéC-ōR). Cf. 13.2.10.

The preceding reasoning and the reconstructed stages in the ablaut system allow us to explain at least part of the ablaut phenomena found in PIE. See for more details Section 13.2.4.

Exercise 26

Explain the rise (in pre-PIE) of the ablaut vowels in the following forms:

a.   nom.sg. *$h_2$éb-ōl* 'apple'
b.   nom.acc. *uéd-ōr*, gen.sg. *ud-én-s* 'water'
c.   nom.sg. *h_2nḗr* 'man'
d.   adj. *ni-pod-ó-* 'settlement'
e.   nom.acc. *néb^h-os*, gen. *neb^h-és-os* 'cloud'

Chapter 13

The Substantive

13.1 Word formation

Nouns consist of a root, which can be followed by one or more suffixes (which are usually followed by an ending). Nouns without suffixes are called root nouns, while all others are called derived nouns. We will refer to the root + suffix as the stem of a noun.

We distinguish primary and secondary suffixes. Secondary suffixes are those which are added on to the stems of existing words, and primary suffixes are those added on to a root.

An important distinction is that between 'nomina agentis' (agent nouns), which indicate an acting person, and 'nomina actionis' (action nouns), which indicate an action or the result of an action, for example E. *singer* versus *song*. The two cannot always be easily distinguished semantically. Formally, it sometimes happens that it is only the accent which distinguishes between them, for example Gr. *phorós* 'carrying': *phóros* 'that which is brought, tribute'. But this is not very frequent.

In what follows we can only name a few of the many suffixes, and those named can only be illustrated with a few examples. Word formation is a very extensive subject; for instance, the description of the word formation of Sanskrit takes up about 1300 pages.

13.1.1 Root nouns

Root nouns were very frequent in PIE, but later their numbers rapidly declined. A root noun can be both action noun and agent noun: Skt. *bhúj-* was both 'joy' and 'the one who feels joy'. As the second element of a compound, root nouns are mostly agent nouns: for example, Lat. *auspex* (< *awi-spek-*) 'examiner of birds'.

We already saw *pōd(s)* 'foot' (11.4.1), *snig^{wh}-* 'snow' (9.2), *ḱḗrd* 'heart' (11.6.2, 11.7.3). Another example is:

PIE *muHs* 'mouse': Skt. *mū́s*, OCS *myšь* (*i*-stem), Lat. *mūs*, OHG *mūs*

If all the languages have suffixes, but different ones, it is probable that we have to do with an old root noun, for example OCS *mъš-ьca*, Lith. *mus-ė̃*, Arm. *mun* < *mus-no-*, Gr. *muῖa* < *mus-i̯a*, Lat. *mus-ca*, all: 'fly, mosquito' from PIE *mus-*. (See Section 14.1 on 'naked'.)

13.1.2 Derived nouns

The suffixes can best be grouped according to the last phoneme, for example *-er* and *-ter* under *-r*; usually the *CeC* forms developed out of the *eC* type (though this is difficult to prove). The 'thematized' forms (i.e., those which took on the *o*-inflection; they have *-o-* as their stem vowel) are treated with the corresponding consonant, thus *-ro-* under *-er-*, *-tro-* and *-tero-* under *-ter-*. The most important suffixes are the following (*-e-* indicates one of the ablaut vowels, i.e. *e/o/Ø/ē/ō*; between parentheses less commonly found forms are given):

eC	(e)Co	CeC	C(e)Co
(ek)	ko		
et	(e)to		
es		ies	
		ues	
eh$_1$		ieh$_1$	
eh$_2$		ieh$_2$	ih$_2$o
er	ro	ter	tro, tero
(el)	lo	tel	tlo
			d^{h}lo
(em)	mo		
en	(e)no	men	
		h$_1$en	
ei	io	tei	
eu	(uo)	teu	
Ø	o		

We shall take the forms in *-r* and *-n* as examples to discuss.

r-suffixes

    -er- is used for the nominative of the neuter *r/n*-stems: **iek^w-r* 'liver'; **h$_1$ésh$_2$-r* 'blood': Skt. *ásr̥-k*, Hitt. *eshar*, Gr. *éar*. Adverbs in *-er*: **(s)uper* 'above': Skt. *upári*, Gr. *húper*, Lat. *super*.

    -ro- we find in a number of old words: **h$_2$eǵro-* 'acre'; **uiHro-* 'man': Skt. *vīrá-*, Lith. *výras*, Lat. *vir*, OIr. *fer*, Goth. *wair* (the last three with shortened *i*).

    -ro- also forms primary adjectives: **h$_2$ugró-* 'strong': Skt. *ugrá-*; **h$_1$rud^{h}ró-* 'red'.

    -ter- in words indicating kinship: **ph$_2$tḗr*, and nomina agentis: **ǵenh$_1$-tōr* 'conceiver, father': Skt. *janitár-*.

    -tro- is used for neuters which indicate the instrument: **h$_2$(e)rh$_3$trom* 'plough': Gr. *árotron*.

-tero-: see the comparative (Section 14.4). Compare also *kʷoteros 'who of two' (see Chapter 15).

n-suffixes

Single *-en-* is found in very old words: *uksḗn 'bull': Skt. *ukṣā́*, Goth. *auhsa* (E. *ox*). It is often used as a secondary suffix: Skt. *rā́j-an-* 'king' (cf. Lat. *rēx*); Lith. *žmuõ*, Lat. *homō*, Goth. *guma* 'human being' is an *n*-stem derived from **dʰǵʰ(e)m-* 'earth'.

-en- forms the oblique cases of the *r/n*-stems: *iekʷ-r, **ikʷ-en-* 'liver': Lat. *iecur*, *iecin-*(*oris*).

-no- forms adjectives: **krs-nó-* 'black': Skt. *kṛṣṇá-*, OCS *črъnъ* (< **čъrsn-*); secondary: Lat. *aēnus* 'of bronze' < **h₂eies-no-*. Substantives have *-no-* and *-neh₂-*: **kʷoi-neh₂-* 'price': Av. *kaēnā-*, OCS *cěna*, Gr. *poinḗ*.

-h₁en-, which indicates a person, is found both as a primary and as a secondary suffix: **h₂iu-h₁en-* 'young': Skt. *yúvan-*, Lat. *iuvenis*; Av. *maϑrā* /manϑraHā/ < **-tro-h₁ōn* 'prophet' ('the man of the mantras').

-men-. Isolated is *h₂éḱmōn 'stone': Skt. *áśmā*, Gr. *ákmōn*. It is also used for agent nouns: Lith. *piemuõ*, Gr. *poimḗn* 'herder'.

Neuters in *-mn̥* are frequent: Skt. *vásma* 'piece of clothes', Gr. *heĩma*; Gr. *spér-ma* 'seed'.

The Caland system is the name given to a group of suffixes often found used with the same root. Thus, adjectives in *-ro-*, *-u-*, *-mo-* occur beside a neuter *s*-stem noun. In the comparative and superlative we find with these adjectives the primary suffixes *-ies-* and *-ist(H)o-* (see 14.4). The most remarkable fact is perhaps that these adjectives show a stem in *-i-* when they are the first member of a compound. Compare:

Av. *dərəz-ra* 'strong', *dərəz-i-raϑa-* 'having a strong chariot'
Av. *xrūra-* (**kruh₂-ro-*) 'bloody', *xrūma-* id., *xruui-dru-* (< **kruh₂-i-*) 'with a bloody weapon'
Gr. *argós* (< *argros, Skt. *r̥jrá-*) 'white, quick', *arg-i-kéraunos* 'having a white (flashing) lightening', *arg-í-pous* 'quick-footed'
Gr. *kūdrós* 'famous', *kū́d-istos*, *kũdos* 'fame', *kūd-i-áneira* 'with famous men' (> 'bringing fame to men')

The *i*-forms will be archaic *i*-stem adjectives. Note that the Caland system is no more than a recurring pattern of archaic forms.

Vr̥ddhi derivatives

Vr̥ddhi (lit. 'increase') is the term used by Indian grammarians for 'lengthened grade'. In IE linguistics the same term is used in a different and less exact way, viz. to refer to changes in quantitative ablaut (Ø → *e* → *ē*). It is believed by many scholars that one way to make a denominal derivative in PIE was to 'upgrade' the ablaut grade of the

derivational basis by one step, that is, by making a zero grade into an *e*-grade, and an *e*-grade into an *ē*-grade. Famous examples are PIE **deiuó-* 'god' to **diéu-/*diu-* 'sky(-god)', and **suēḱ(u)ró-* 'brother-in-law' to **suéḱuro-* 'father-in-law'. The derivative would have a meaning of appurtenance or origin, and it often takes an accented suffix **-ó-*.

However, it is unlikely that we are dealing with a regular morphological procedure of PIE date. Firstly, the main body of evidence comes from Indo-Iranian and Germanic. In those languages, it is clear though that lengthened-grade derivatives are productive, which is exactly why they cannot be relied on. For example, Skt. *su-má-nas-* 'with a good mind' → *sau-manas-á-* 'benevolence', *áyas-* 'metal' → *āyasá-* 'made of metal' show a productive long vowel in the first syllable plus stressed *-á-*; Av. *maz-da-iiasna-* 'worshipper of Ahura Mazda' → *māzda-iiasni-* 'of a worshipper of Ahura Mazda', Skt. *sarátha-* 'travelling on the same chariot' → *sárathi-* 'charioteer' show the same vr̥ddhi plus a replacement of suffixal *-a-* by *-i-*.

Secondly, there are hardly any word equations which can be found between the IE branches. For instance, the **ē* in **suēḱ(u)ro-* 'brother-in-law' only appears in Germanic, whereas all other branches have **suéḱuro-* 'father-in-law'.

There are good alternative explanations for the alleged cases of *e*-grade derivatives which are present in all branches, such as **deiuó-* 'god' or **neuo-* 'new'. As we will discuss in Section 13.2, PIE athematic nouns were characterized by ablauting paradigms. We will also see that many athematic nouns became thematic (*o*-stems) in the individual languages. In the case of 'sky', the oldest paradigm will have been nom. **déi-u*, acc. **di-éu-m* (> **diēm* by lengthening), gen. **di-u-ós*. Thus, *e*-grade occurred beside zero grade in the root. Whereas the attested word for 'sky-god' has generalized the forms of the acc. and gen. (creating a new nom.sg. **diēu-s*), the thematic word **dei-u-ó-* may well be based on the earlier nom.sg. **dei-u-*. In the same way, many other alleged *e*-grade derivatives to zero-grade nominal roots may be explained as independent derivatives from an ablauting basis.

Internal derivation

In the last two decades, the idea has gained acceptance that PIE did not only derive nominal forms by means of affixation (= external derivation), but also by internal derivation, that is, by means of a switch to a different inflectional pattern (see Section 13.2.4 for the main inflectional patterns). Within the attested languages, such a switch is known in the form of a change in the place of the accent, which can distinguish substantives from adjectives in Sanskrit, Greek and Baltic. For instance, Skt. *kr̥ṣná-* 'black' vs. *kŕ̥ṣṇa-* 'black antilope', *apás-* 'active' vs. *ápas-* 'work', Gr. *dolikhós* 'long' vs. *dólikhos* 'the long course (in racing)', Lith. *áukštas* 'high' vs. *aūkštas* 'floor, storey'.

The PIE process is essentially viewed as a shift in inflectional pattern, either from a static base noun to a proterodynamic adjective, or from a PD noun to a derived HD noun. Thus, to acrostatic **kré/ót-u-* 'insight' (Skt. *krátus*) would have been formed

PD *$krét$-u-/*$kr̥t$-$éu$- 'having mental force' (Gr. *kratús* 'strong'). From PD *$séh_1$-mn 'seed' (Lat. *sēmen*) a HD derivative *seh_1-$mōn$ 'he of the seed' (Lat. *Sēmōn-ēs* 'deities of the seed') would have been derived. None of the evidence put forward for a PIE switch of the inflectional class is probative, however. Many of these pairs may have arisen in *bahuvrīhi* compounds with neuters as second members, cf. Gr. *ménos*, Skt. *mánas*- n. 'mind' : Gr. *eumenḗs*, Skt. *su-mánas*- adj. 'of good mind'; Skt. *dhárman*- n. 'law' : *satyá-dharman*- adj. 'of true laws'. Whereas neuters had PD inflection, the compounds, being adjectives, were inflected according to the HD pattern (nom. *ᵒdharmā*, acc. *ᵒdharmāṇam*, etc.).

13.1.3 Reduplicated nouns

Alongside words with total reduplication of the root, as Gr. *bár-bar-os*, Skt. *bal-bal-ā-karoti* 'to stutter' (*karoti* 'to do'), there are old words with reduplication in *Ce-* or *Ci-*. The best known word is that for 'wheel': Skt. *cakrá-*, Lith. *kāklas* 'neck' (for *ke-?), Toch. A *kukäl*, Toch. B *kokale*, Gr. *kúklos*, OE *hwēol*, forms which point to *k^we-k^wl-(o-). The word for 'beaver' displays different suffixes and was probably a root noun: Skt. *babhrú-*, Lith. *bebrùs* are *u*-stems; Lith. *bēbras*, Lat. *fiber* reflect *o*-stems. This word also has forms with *i* in the reduplication. It is possible to think of an inflection nom. *$b^hé$-b^hr, gen. b^hi-b^hr-$ós$. (For *e/i* see Section 18.1.3)

13.1.4 Compounds

A complete description of the formation and the meaning of compounds would take up an enormous amount of space. We shall therefore limit ourselves to a very summary examination of this subject. PIE probably had many compound words; in some languages, such as Latin and Balto-Slavic, the possibility of forming compounds has very much declined, while for example Greek and Sanskrit remained very flexible in this respect.

The following formal aspects of compounds must be mentioned:

1. The (last morpheme of the) first element is usually found in the zero grade, such as Skt. *nr̥-hán-* 'man-killing'.
2. The second element often has *-o-* in the place of *-e-*, for example Gr. *eu-pátōr* 'from good parents' as opposed to *patḗr*. The reason must be that the second element was often unaccented; see Section 12.2.5.

Compounds can be classified on the basis of their meaning. We must describe the relationship between the first element, the second element and the referent, the latter term describing the entity that is referred to by the compound.

The first distinction is that between endo- and exocentric compounds. In the first case, the referent is identical with the first or second element, in the second case the referent is not identical with either element. In Skt. *viś-páti-* 'lord, leader of the clan' the referent is 'leader' (*páti-*); the word, then, is endocentric. In Skt. *ugrá-bāhu-* 'with strong arms' the referent is neither 'strong' (the arms are strong) nor 'arm' (the word does not mean 'strong arm'); the word is exocentric. Within the endocentric type the referent can be identical with either the first or the second element. PIE had basically three types of compounds:

1. **Bahuvrīhis** (literally: 'having a lot of rice'; this is the term of the old Indian grammarians) or **Possessive compounds** are exocentric compounds, which indicate what the referent 'has'. Examples: Lat. *magnanimus* 'having great courage, being courageous'; Gr. *dus-menḗs*, Skt. *dur-manā́s* 'one who is evil-minded'; Goth. *fidur-dogs* 'that lasts for four days'. Notice that the translation, which depends on the possibilities of the target language, is not essential. This group was by far the largest of the three.
2. **Determinative compounds**. The referent is identical with the second element of the compound (these are therefore endocentric). Examples: Lat. *signi-fer* 'banner-carrier'; the referent is 'carrier'; of what is determined by the first element. The second element is often a verbal root which sometimes takes *-t-*, for example Skt. *pathi-kŕ̥-t-* 'road-builder'; Lat. *sacerdōs, -dōt-is* < **-dʰoh₁-t-* 'priest' ('he who lays [down] the sacrifice'); Gr. *su-bṓ-t-ē-s* 'swine-herder' has an *ā > ē* added on to the *-t-*.
3. **Governing Compounds**. The referent is identical with the first element (these are then endocentric). Examples: Skt. *trasá-dasyu-* 'bringing fear to the enemy (*dásyu-*)'; the referent brings fear. Gr. *arkhé-kakos* 'he who does evil first'. These compounds are not often found.

As a fourth category, one can name the fairly rare group of the **dvandvas** or coordinating compounds, which simply indicate the totality of the two elements, for example Skt. *indra-vāyū́* 'Indra and Vayu' (two of the most important gods from the Indian pantheon). The second element is in the dual form (because the whole compound expresses a duality). Originally both elements were in the dual, each with its own stress: Skt. *dyávā-pr̥thivī́* 'heaven and earth.'

Exercise 27
Explain the difference between primary and secondary suffixes.

Exercise 28

To which type of compound belong the following words?

a.   Lat. *quindecim* 'fifteen'
b.   Skt. *ájñāta-* 'unknown'
c.   Lat. *bi-ped-* 'two-footed'
d.   Skt. *kṣayád-vīra-* 'ruling over men'
e.   Gr. *aleksí-kakos* 'warding off evil'
f.   Gr. *rhodo-dáktulos* 'rosy-fingered'

13.2   Inflection

The inflection of the adjective is in principle identical with that of the substantive. We shall therefore include the adjectives here.

13.2.1   The type of the Indo-European inflection

In general stem and ending are clearly distinguishable in PIE. Occasional exceptions occur in the *o*-stems, in which the suffix and the ending have sometimes merged into a long vowel, as in the dative singular **-ōi < *-o-ei*.

An ending indicates more than a single grammatical category. Thus **-os* is both genitive and singular.

A form is distinguishable not only by the ending, but also by the position of the accent and the ablaut. Originally, the ablaut was dependent on the accent, but in PIE (in the last phase of the proto-language) that was no longer the case.

13.2.2   Case and number

PIE had, apart from a singular and plural, also a dual case, a separate set of forms referring to pairs. The dual has disappeared in a number of languages, but still exists in Indo-Iranian, Balto-Slavic, Tocharian, Greek and Celtic. Thus, '(someone's two) eyes' is: Skt. *akṣī́*, Av. *aši*, OCS *oči*, Lith. *akì*, Gr. *ósse*, Toch. A *aśäm*, Toch. B *eś(a)ne*, OIr. *dí śúil*. We shall deal with all of the dual forms together in Section 13.2.11.

PIE had the following eight cases: nominative (indicating the subject of a clause), vocative (the addressee of an utterance), accusative (direct object), genitive (possession), ablative (source), dative (indirect object, possession, beneficiary), locative (place where or time when), and instrumental (means, agent). In many languages the number of cases has been reduced. Those lost are almost always the last four (see Section 8.2).

Case-endings

Here is an overview of the PIE case-endings of the singular and plural of athematic stems; see also the paradigms of the *n*-stems, *r*-stems, h_2-stems and *u*-stems given in 13.2.5–8. Below, the reconstruction of each ending will be briefly discussed. The endings of the *o*-stems differ only for some of the case-forms, see 13.2.9.

	sg.	sg.ntr.	pl.	pl.ntr.
nom.	Ø, -s	Ø	-es	-h_2, Ø
voc.	Ø	Ø	-es	-h_2, Ø
acc.	-m	Ø	-ns	-h_2, Ø
gen.	-(o)s		-om	
abl.	-(o)s; -(e)t		-ios	
dat.	-(e)i		-mus	
loc.	-i, Ø		-su	
ins.	-(e)h_1		-b^hi	

In the neuter the accusative is always identical with the nominative. For an explanation see Section 13.2.10.

The Singular

Nominative. Most athematic stems have a zero ending in the nom.sg. combined with a lengthened grade of the suffix (in animate nouns). The *o*-stems and part of the *i*- and *u*-stems (viz. those with a zero-grade suffix in the nom.sg.) take *-*s*. Some of the stems in an obstruent also seem to take *-*s*, though this could be secondary. The interpretation of the difference between Ø and -s is disputed. Some scholars are of the opinion that all nom.sg. forms originally had *-*s*, which was assimilated to a preceding resonant and caused compensatory lengthening of the suffix, e.g. *ph_2-tér-s* > *ph_2tḗr*. This lengthening is now often referred to as Szemerényi's Law. However, Szemerényi's Law does not explain why a sequence *-*en-s* is retained e.g. in the archaic gen.sg. of *n*-stems, or why there is no -s in the nom.sg. of h_2-stems. We will therefore assume an original *s*-less nom.sg. in all flexion classes, with lengthening of a suffix vowel *o* or *e* by phonetic development (see Chapter 12). Later the nom. acquired *-*s* in many stems (first of all, *i*- and *u*-stems) by analogy with the *o*-stems. The difference between athematic stems and *o*-stems, and the absence vs. the presence of -s in their nom.sg., can be understood from the early (Pre-)PIE case system, which differed from the one described above (13.2.10).

Vocative. The vocative has no ending. It is characterized by the *e*-grade of the suffix. The absence of lengthening in word-final *-eR* points to a more recent origin of the vocative, after the sound change *-*VR* > *-*V̄R* had ceased to operate. Possibly, it arose from suffixation of *-*e* (as found in the *o*-stems), to which the stem-final consonant was then added.

Accusative. The ending was a single *-m*, which was vocalic after a consonant (*-m̥*) and resulted in Skt./Gr. *-a*; Sanskrit, thereafter, added the *-m* (from other declensions, e.g. the *i*-stems: *-i-m*).

Nominative/accusative neuter. The ending of athematic neuter nouns was zero.

Genitive. Most languages continue *-os*. In Latin and BSl. we find *-es*, but in Latin, *-os* is retained in some archaic forms. It is possible that *-es* arose by analogy with the full grade endings dat.sg. *-ei*, ins.sg. *-eh₁*, vocatives in *-eR* and, in Latin, acc.sg. *-em*. In the proterodynamic and static inflection, the ending was a mere *-s*.

Ablative. A separate form for the ablative singular is, outside Hittite, only found in the pronouns and with the *o*-stems, which have *-o-et*. The final stop is variously reconstructed as *-t* or *-d*, the distinction being blurred by word-final neutralization in the relevant languages. With athematic nouns, the ablative function is expressed by the genitive ending.

Dative. The dative has *-ei*. Since this is a full-grade form, one may surmise that it arose in suffix-stressed forms, which, as we will see in 13.2.4, belonged to animate nouns.

Locative. The most frequently found loc.sg. ending was *-i*. Note the identity with the ending of the dative; in Hittite, there is no distinction between both cases, which are expressed by *-i*. Thus, the dative and locative seem to continue one original case with the endings *-i* and *-éi*. The neuters, which refer to inanimate things, would not have had a dative case, but would have had the locative. Conversely, a locative will hardly have been used for persons.

 Beside the loc.sg. in *-eC-i* there was an endingless locative which had a full or lengthened grade of the suffix (*-ēn*, *-ēu*, but also Gr. *aién* 'always', which may represent an original locative). It is clear that the endingless forms are more archaic; they look like the hysterodynamic acc.sg. without *-m*.

Instrumental. The ins.sg. ended in *-eh₁* or, as found in the *i*- and *u*-stems, in mere *-h₁*. Some languages have replaced it with the plural ending *-bʰi* (Greek *-phi* as in Hom. *naûphi* 'with the ships', and Armenian *-b*) or *-mi* (Slavic *-mь*), a contamination with the dative (plural) ending. It has been suggested that *-bʰi* represents the same particle 'near' which yielded E. *by*.

Instrumental and ablative in Hittite. Hittite has an ablative ending *-z* < *-ti* and instrumental *-t* < *-t*, both used for singular and plural. The reconstruction of ins. *-t* rather than *-d^(h)* cannot be ascertained but is motivated by the analysis of abl. *-ti* as *t* plus *-i*. Support for this conjecture comes from the Hittite pronouns which show an ending *-t* with ablative meaning: *kēt* 'on this side', *apēd* 'there'. Anatolian *-t* is most straightforwardly compared with non-Anatolian *-t* or *-d* in the abl.sg. of *o*-stems and pronouns.

Since ins.sg. *-h_1 is absent from Anatolian, there may have been a Late PIE phonetic change of the ending *-*t* via *-*d* to *-h_1 in certain contexts, probably after a consonant.

The Plural

Nominative. The animate nom.pl. was *-*es*. Latin -*ēs* continues the *i*-stem ending *-*ei-es*.

Accusative. The PIE ending was *-*ns*, which was mostly vocalized as *-*n̥s* after consonants. Hittite -*uš* < *-*ms* and *-*oms* shows that the acc.pl. was made by adding plural *-*s* to the acc.sg. ending.

Nominative/accusative neuter. This ending in reality continues a sg. form, viz. the nom.sg. of a collective noun which came to indicate 'the complex of' something. One of the endings found is *-h_2 (> Skt. -*i*, Gr. -*a*) which was the nom.sg. of a derived h_2-stem. The other ending is zero, accompanied by the lengthened grade of the suffix; it is found mainly in *n*-stems, *r*-stems and *s*-stems. Such a form was really the nom.sg. of an animate and hysterodynamic variant *CéC-ōR* of a neuter (and proterodynamic) stem *CéC-R*, see 13.2.4. This analysis is confirmed by the syntax of nouns in the neuter plural, which take a verb in the singular. This is understandable from the fact that the neuter plural was originally a collective, as in Gr. *dṓmata* 'palace' = '(the complex of the) houses'; compare E. *vermin*. Such a collective can naturally be found with masculine and feminine words too, for example Lat. *locus* 'place', pl. *locī*, but also *loca*; Gr. *mērós* 'thigh', pl. *mēroí* (often du. *mērṓ*), but *mēra* 'thigh-bones' (of sacrificed animals).

Genitive. Greek and Sanskrit at first sight have *-*ōm*, Latin and Hittite can go back to -*ōm* or -*om*, but Umbrian, Celtic and Balto-Slavic point to *-*om* (the widespread view that these latter forms could be shortened from *-*ōm* is incorrect). Goth. -*e* can reflect *-*ei-om*, the gen.pl. of the *i*-stems. Now the ending -*ām* of Skt. and Avestan *a*- and *ā*-stems is sometimes scanned disyllabically as -*aHam*; this points to a contracted ending *-*aH-om* of the h_2-stems, and/or a novel form *-*o-om* in the *o*-stems. As a result, the PIE ending is most plausibly reconstructed as *-*om*. — This form is identical to the ending of possessive adjectives such as Skt. *asmā́kam*, OP *amāxam* 'ours', Lat. *nostrum*; compare also the Arm. adjectival suffix -*c'* < *-*skom*. Hence, the gen.pl. *-*om* was originally an adjectival form (cf. 'kingly' = 'of kings').

Dative. Skt. -*bhyas* resembles Lat. -*bus* and both could be based, respectively, on -$b^h ios$ or -$b^h os$. But Latin does not have the -*i̯*- of Sanskrit, and cannot have lost it either. Balto-Slavic points to -*mVs* (*V* = short vowel), which resembles Latin -*bus* in structure. Goth. -*am* reflects *-*a-mVs*; the *u*-infection in OHG *tagum* points to *-*mus*. Slav. -*mъ* and Old Lithuanian -*mus* also show *-*mus*. Since its -*u*- cannot be explained otherwise, -*mus* must have been the old dative ending. This provides a simple solution for the fact that Balto-Slavic and Germanic both have -*m*- where the other languages have -b^h-. If the dative had -*m*- (-*mus*) and the instrumental had -b^h- (-$b^h i$), the individual languages could have generalized either -*m*- or -b^h-.

Now $*-b^hios$ and $-b^hos$ remain to be explained. It has recently been proposed that there may have been an old **Ablative** ending *-ios*, which would have been the origin for the forms ending in *-os*.

Locative. The loc.pl. was $*-su$; OCS *-xъ* arose after *i, u, r, k*, by regular development. Lithuanian *-se* goes back to *-su*, which is still present in Old Lithuanian and in dialects; the *-e* goes back to the same particle as in the singular. Greek has changed *-su* to *-si*, after the locative singular.

Instrumental. The instrumental plural $*-b^hi$ has been discussed under the singular.

13.2.3 Gender

The oldest languages, with the exception of Hittite, have three genders, masculine, feminine and neuter. It has been doubted, however, whether the feminine gender is of PIE origin. There was no formal distinction between masculine and feminine stems, for example $*ph_2t\acute{e}r$ 'father' alongside $*d^hug h_2t\acute{e}r$ 'daughter'. (The grammatical gender is, incidentally, not always dependent on the natural gender.) The *o*-stems are masculine, but here too there are exceptions. Thus $*snus\acute{o}s$ 'daughter-in-law' is feminine (Gr. *nuós*, Arm. *nu*; in Skt. *snuṣā́*, OCS *snъxa*, OE *snoru* the word has become an *ā*-stem; Lat. *nurus* is a *u*-stem). And $*h_1e\acute{k}u(o)$- 'horse' is also used for a 'mare' (Gr. *hē híppos*). Doubts about the PIE age of the feminine gender were reinforced by the oldest language, Hittite, not having any feminine forms.

Of course, gender difference does not need to be accompanied by a difference in form. For instance, the forms of Du. *huis* 'house' and *buis* 'tube' do not show that the first is neuter and the second masculine-feminine. What is essential is the agreement with the adjective (and the pronouns), that is to say, whether the adjective has two different forms (for masculine and feminine). In PIE, the feminine is either not indicated in the adjective, or is indicated by means of the suffix $*-(i)eh_2$ (see Section 14.2). We must ask how old the use of these suffixes is, in order to distinguish between two kinds of substantives. In view of the complete lack of a masculine/feminine distinction in Hittite, we may conclude that the three-gender system arose in Late PIE after Anatolian had split off. Hittite does continue some h_2-stems (= *ā*-stems), but they are not used for females. Thus, the Indo-European feminine gender is recent, as is the association of the suffix $*-(i)eh_2$- with females ($*deiu-os$ 'god', $*deiu-ih_2$ 'goddess'; $*so$ 'he', $*seh_2$ 'she').

There are also indications that the neuter is a relatively recent category, in particular, the fact that its endings only differ from the masculine in the nominative-accusative. This state of affairs is confirmed by the adjective. For an explanation of the origin of the neuters see Section 13.2.10.

13.2.4 The inflectional types

In the last decades our insight into the inflection of the nouns has greatly increased. Much, though, is still open to discussion.

The most important categorization of inflectional types which can be made is that in *ā*-, *o*- and consonant stems (*C*-stems), the Greek and Latin first, second, and third declensions. Since *ā* reflects *$*eh_2$, the *ā*-stems also turn out to have been consonant stems. They may have remained a deviant group, but it has been plausibly suggested that they behaved precisely as did the consonant stems. This means that there is one division which still remains: *o*-stems and *C*-stems. The *o*-stems, indeed, are a separate group, in part because their endings are different from those of the other types.

Within the *C*-stems it is possible to distinguish at least two kinds of inflections, which differ in ablaut. These types are called hysterodynamic (dynamis 'accent'; hystero- = 'more toward the back') and proterodynamic (protero- = 'more toward the front'). A good understanding of these two types of inflection is fundamental for an insight into the whole subject. If we should indicate the suffix with *-eR-*, these two types are characterized by the following forms ($\bar{V}$ = long vowel, *V* = short vowel):

	HYSTERODYNAMIC INFLECTION		PROTERODYNAMIC INFLECTION	
nom.	$\bar{V}R$	*$*ph_2tḗr$* 'father'	*CéC-R (s)*	*$*mén\text{-}ti\text{-}s$* 'thought'
acc.	*VR-m*	*$*ph_2tér\text{-}m$*	*CéC-R (m)*	*$*mén\text{-}ti\text{-}m$*
gen.	*R-ós*	*$*ph_2tr\text{-}ós$*	*CC-é/óR-s*	*$*mn\text{-}téi\text{-}s$*

If two consonants are found in the place of the *R* in the nominative of the hysterodynamic inflection, the vowel is a short one, as in *$*h_3d\text{-}ónt(s)$* 'tooth', adj. *$*\text{-}uent(s)$* 'possessing'.

The neuters and some of the masculine-feminine nouns followed the proterodynamic (hereafter: PD) inflection. The neuter forms had no nom. *$*\text{-}s$*, acc. *$*\text{-}m$*. The hysterodynamic (hereafter: HD) inflection displays a number of subtypes:

nom.	*CéC-R* (1)	*CéC-ōR* (2)	*C(e)C-ōR* (3)	*CC-ḗR* (4)
acc.	*CC-éR-m*	*CC-éR-m*	*C(e)C-oR-m*	*CC-éR-m*
gen.	*CC-R-ós*	*CC-R-ós*	*C(e)C-R-ós*	*CC-R-ós*
	Goth. *bandi*	*$*dʰéǵʰōm$*	Gr. *dótōr*	*$*ph_2tḗr$*

Subtype (1) was probably the most original type of HD inflection, and must have been the point of departure for (2) and (3). Nouns which actually preserve the zero grade in the suffix are rare, though. Subtype (2) is probably the oldest type with *o* in the suffix. This is difficult to prove because (2) usually changed into (3), whereby both the ablaut and the stress movement were simplified. Due to different simplifications there are a

number of variants in subtype (3), and we must refrain from indicating the stress in the nominative and accusative; (3) is actually a collection of subtypes. Types (2) and (3) are often called amphidynamic on the assumption (which we do not share) that the suffix was never stressed in those types. Subtype (4) has *e* in the suffix, and the root always has the zero grade. It arose by introducing the stem of the acc. into the nom., as happens in many languages. Type (4) is found in the well-known word for 'father' but is on the whole quite rare. See Section 13.2.10 for further background.

Some traces have been found which suggest the presence of a third kind of inflection (alongside the HD and PD types), the static inflection. This type has almost disappeared from the languages which are known to us. It always had the full grade with stress on the root (hence the name 'static'), and for this reason the zero grade of the suffix:

		STATIC INFLECTION	
nom.	*CéC-R*	**méh₂-tr*	Skt. *mā(tā́)* 'mother'
acc.	*CéC-R (-m)*	**méh₂-tr-m*	*mā(táram)*
gen.	*CéC-R-s*	**méh₂-tr-s*	*mātúr*

In Sanskrit the nominative and the accusative of 'mother' have been formed on the model of 'father'; *-ur* < **-r̥s*. The suffix stress in Sanskrit is not old, cf. Gr. *mḗtēr*.

The nouns are usually categorized according to the (last phoneme of the) suffix, thus as *i*-stems, *r*-stems, etc. This is necessary because each of these stems displays special developments in the individual languages.

Which stems follow which inflection is indicated in the following table (those infrequently found are listed in parentheses):

HD	m.-f	*(k)*	*t*	*nt*	*s*	*h₁*	*h₂*	*r*	*(l)*	*(m)*	*n*	*i*	*u*
PD	ntr.				*s*			*r/n*	*(l/n)*		*n*	*(i)*	*u*
	m.-f						*(h₂)*					*i*	*u*
ST	m.-f		*(t)*	*nt*				*r*				*(i)*	
	ntr.							*r/n*					

Exercise 29

State the case in which the following reconstructed forms are given:

a. *teut-eh$_2$-m
b. *deh$_2$i-ur-su
c. *h$_1$su-men-ēs(-Ø)
d. *uiH-ro-ns
e. *Hreh$_1$i-uent-s
f. *neh$_2$-u-b^{h}i
g. *diu-t-ei
h. *nep-t-os
i. *h$_2$ek̑s-i-om
j. *h$_3$leig-ios-es

Exercise 30

Provide the correct endings for the following PIE stems (don't mind the ablaut grade):

a. *ph$_2$-tr- 'father'   loc.sg.
b. *ped- 'foot'   gen.sg.
c. *g^{h}eb^h-h$_2$- 'gift'   gen.pl.
d. *peh$_2$-un- 'fire'   loc.sg.
e. *nek̑-u- 'corpse'   nom.sg.m.
f. *d^{h}ugh$_2$-tr- 'daughter'   nom.sg.
g. *tr-i- 'three'   ins.pl.
h. *h$_2$eus-i- 'ear'   acc.pl.m.
i. *k̑Hl-et- 'hero'   ins.sg.
j. *seh$_1$-mn- 'seed'   loc.sg.
k. *Hros-h$_2$- 'dew'   loc.pl.
l. *h$_2$eǵ^h-os- 'fear'   acc.sg.n.
m. *h$_3$neh$_3$-mn- 'name'   dat.sg.
n. *sueh$_2$d-u- 'sweet'   dat.pl.

Exercise 31

Determine on the basis of their ablaut grade whether the following reconstructed paradigms are static, proterodynamic or hysterodynamic:

a. *h$_3$eu-i-s   b. *nok^w-t-s   c. *sek^w-mn   d. *h$_1$ei-nt-s   e. *ulk^w-ih$_2$
   *h$_3$eu-i-m   *nok^w-t-m   *sek^w-mn   *h$_1$i-ent-m   *ulk^w-ieh$_2$-m
   *h$_3$u-ei-s   *nek^w-t-s   *sk^w-men-s   *h$_1$i-nt-os   *ulk^w-ih$_2$-os

Exercise 32

Describe the deviations (in the ablaut *e/o, ē/ō*) between the following paradigms and the prototypical static, proterodynamic or hysterodynamic inflection types. Try to determine on the basis of the ablaut to which inflectional type (static, PD, HD) each paradigm belongs.

a.		b.		c.		d.	
nom.	*$\acute{g}$énh$_1$-os*		*suH-nú-s*		*h$_2$éus-ōs*		*dór-u*
acc.	*$\acute{g}$énh$_1$-os*		*suH-nú-m*		*h$_2$us-ós-m*		*dór-u*
gen.	*$\acute{g}$enh$_1$-és-os*		*suH-nóu-s*		*h$_2$us-s-ós*		*dér-u-s*
	'race'		'son'		'dawn'		'wood'

13.2.5 The hysterodynamic inflection

The basis structure of the stem and the ablaut of the suffix have been discussed in the preceding section. In (a) and (b) below we will provide comparative paradigms for the *n*-stems and the *r*-stems, which may serve as an illustration of their inflection. We cannot go into a discussion of the many deviating forms which are found in the individual languages. In the discussion of the stems from (c) onwards we shall limit ourselves to the main cases which illustrate the type of inflection, viz. nominative, accusative and genitive.

a. *n*-stems
These are very frequent. The type of *n*-stem inflection which is found most frequently in the IE languages belongs to subtype (2) of the HD class.

	PIE	Skt. 'king'	OCS 'stone'	Lith. 'stone'	Gr. 'anvil'	Lat. 'man'	Goth. 'man'
SINGULAR							
nom.	$-\bar{o}n$	rā́jā	kamy	akmuõ	ákmōn	homō	guma
voc.	$-on$	rā́jan	-	akmeniẽ	ákmon	homō	-
acc.	$-én-m$	rā́jānam	kamenь	ãkmenį	ákmona	hominem	guman
gen.	$-n-ós$	rā́jñas	kamene	akmeñs	akmonos	hominis	gumins
dat.	$-n-éi$	rā́jñe	kameni	ãkmeniui	-	hominī	-
loc.	$-én(-i)$	rā́jan(i)	kamene	akmenyjè	ákmoni (dat.)	homine (abl.)	gumin (dat.)
ins.	$-n-éh_1$	rā́jñā	kamenьmь	ãkmeniu	-	-	-
PLURAL							
nom.	$-ón-es$	rā́jānas	kamene	ãkmenys	ákmones	hominēs	gumans
acc.	$-é/ón-ns$	rā́jñas	kameni	ãkmenis	ákmonas	hominēs	gumans
gen.	$-n-óm$	rā́jñām	kamenъ	akmenų̃	ákmónōn	hominum	gumane
dat.	$-n-mós$	rā́jabhyas	kamenьmъ	akmenìms	-	hominibus	gumam
loc.	$-n-sú$	rā́jasu	kamenьxъ	akmenysè	ákmosi (dat.)	-	-
ins.	$-n-b^hí$	rā́jabhis	kamenьmi	akmenimìs	-	-	-

Singular. Nom.sg. *-ōn. In some languages the -n in the nom.sg. has disappeared after the long vowel. Nouns with nom.sg. *-ēn, acc.sg. *-en-m are rare. For the vocative, Skt. and Gr. both suggest *-on, but the original form may have been *-en (cf. the r-stems). In the accusative some languages point to *-on- (Skt., Gr., Gmc.), others to *-en- (BSl.); Lat. -in- may have had either. The generalization of *-en- in BSl. can hardly have come from the locative alone, which suggests PIE acc. *-en-. The locative probably had *-en- in Sanskrit, as is confirmed for example by Gr. *aién* 'always'. In the other oblique cases, -n- as found in Sanskrit must be old; Greek still has some cases of -n-, e.g. *kú-ōn, ku-n-ós* 'dog'.

Plural. The Sanskrit nom. *-ānas* shows *-on-, as also found in Greek and Germanic. The genitive and the other oblique cases all have -n- in Sanskrit just as in the singular (*a < ṇ*). This time the locative also has -n-; the same applies to Greek, where *-osi* cannot be based on *-onsi (which would have given *-ousi), but replaces *-asi* < *-ṇsi (with the *o* of the other forms); this form we still find once in *phrasí* 'midriff, thoughts' (which was later replaced by *phresí*, following nom. *phrḗn*, acc. *phréna*). There is little hard evidence for *-en-ns in the accusative; but it has the advantage that the structure then becomes identical to that of the singular (*-en-m).

b.   *r-stems*

The r-stems display the same inflection. The words in *-ōr* are completely parallel with those in *-ōn*. Those in *-ēr* are especially the kinship terms. Here is their paradigm:

	PIE	Skt.	OCS	Lith.	Gr.	Lat.	Goth.
SINGULAR							
nom.	-ḗr	pitā́	mati	dukté̃	patḗr	pater	broþar
voc.	-er	pítar	-	=	páter	pater	fadar
acc.	-ér-m	pitáram	materъ	dùkteri̧	patéra	patrem	broþar
gen.	-r-ós	pitúr	matere	dukter̃s	patrós	patris	broþrs
dat.	-r-éi	pitré	materi	dúkteriai	patrí	patrī	broþr
loc.	-ér-i	pitári	materi	dukteryjè		patre	
ins.	-r-éh₁	pitrā́	materъjǫ	dukterimì			
PLURAL							
nom.	-ér-es	pitáras	materi	dùkterys	patéres	patrēs	broþrjus
acc.	-ér-ns	pitr̄́n	materi	dùkteris	patéras	patrēs	broþruns
gen.	-r-óm	pitr̥ṇā́m	materъ	dukterŭ̧	patérōn	patrum	broþre
dat.	-r-mós	pitŕ̥bhyas	materъmъ	dukterìms		patribus	broþrum
loc.	-r-sú	pitŕ̥ṣu	materъxъ	dukterysè	patrási		
ins.	-r-bʰí	pitŕ̥bhis	materъmi	dukterimìs		patribus	

For Skt. -ur < *-rs see Section 13.2.7.

c.   *l*-stems

The word for 'apple' may be reconstructed as follows:

nom.   *h₂éb-ōl   cf. Latv. âbuōls
acc.   *h₂b-él-m   cf. Lith. obelìs
gen.   *h₂b-l-ós   cf. Russ. jabloko, OS appul < *aplaz

The *a-* < *h₂e-* was thus generalized.

   The word for 'salt' shows a very archaic kind of ablaut (subtype 1):

nom. sg.	*séh₂-l	Lith. sól-(ymas) 'salt water',	Gr. (hál-s)	Lat. sāl
		Latv. sàls 'salt'		
acc.	*sh₂-él-m	OCS sol-(ъ)	hál-a	sal-em
gen.	*sh₂-l-ós		hal-ós	sal-is

d.   *m*-stems

These also can only be reconstructed indirectly. As an example, we take the word
*ǵʰéi-ōm:

	PIE	Av.	Arm.	Hitt.	Gr.	Lat.
nom.	*$ǵ^héi$-ōm	ziiā̊	jiwn		khi-ṓn	hiems
acc.	*$ǵ^hi$-ém-m				khi-ón-a	hiem-em
gen.	*$ǵ^hi$-m-ós	zimō	jean		khi-ón-os	hiem-is
loc.				gim-i		

The word means 'winter', except in Armenian and Greek: in these languages it means 'snow' and has become an *n*-stem (through -*m* > -*n*). The root form *$ǵ^hei$- is still found in OCS *zima*, Lith. *žiemà* and Gr. *kheimṓn* 'winter'; other forms have generalized *$ǵ^hi$- (Av. *ziiā̊* < *$ǵ^hi$-ō[s]*).

The word for 'earth' also belongs here:

	PIE					
nom.	*$d^héǵ^h$-ōm, -m	Gr.	khthṓn	Skt.	kṣā́s	Hitt. tēkan
acc.	*$d^hǵ^h$-ém-m		khthón-a			tēkan
gen.	*$d^hǵ^h$-m-ós		khthon-ós		jm-ás	takn-as

This word was considered to be a root noun until the Hittite form became known, which shows *e*-grade between the two initial stops. Hitt. -*an* may reflect *-ōm*; the word has become a neuter in Hittite, elsewhere it is feminine.

e.   *t*-stems

These are also rare. An old word is that for 'grandson':

	PIE								
nom.	*nép-ōt	Skt.	nápāt	Lat.	nepōs	OIr.	nie	Lith.	(nepuotis)
acc.	*nep-ót-m		nápātam		nepōtem				
gen.	*nep-t-ós		náptur		nepōtis		nieth	Gr.	(anepsiós)

Avestan has the original gen. *naptō* < IIr. *-as*. The Lithuanian word became an *i*-stem (via the acc. -*im* < *-m̥*). In Germanic OE *nefa* 'nephew' (*nephew* itself is a loan from French) became an *n*-stem. Perhaps the root must be reconstructed as *h_2nep- because of Gr. *anepsiós* (< -*pti*-).

f.   *nt*-stems

The suffix -*uent*- 'possessing, rich in' was inflected as follows (Skt. *revánt*- 'rich in treasures', Gr. *kharí-ent*- 'gracious'):

	PIE						
nom.	*-uént(s)	Skt.	-vā́n	Av.	-uuā̊, -uuą̄s	Gr.	-eis
acc.	*-uént-m		-vánt-am		-uuaṇt-əm		-ent-a
gen.	*-u̯nt-ós		-vát-as		-uuat-ō		-ent-os

The nominative here has a short vowel before a double consonant. In such a case the vowel is not lengthened. The long vowel of Sanskrit is analogical. The same happened in Av. *-uuå*; in *-uuąs* < *-*u̯ants*, the *-s* is a recent addition. It is possible that the nominative was *-unt*, and that *-u̯ents* only arose in the individual languages.

An isolated but well-known word is that for 'tooth':

	PIE	Skt.	Lith.	Gr.	Lat.	Germ.
nom.	*h_3d-ónt(s)*	*dán*	*dantìs*	*odṓn*	*dēns*	OS *tand*
acc.	*h_3d-ónt-m*	*dánt-am*	*dañtį*	*odónt-a*	*dent-em*	
gen.	*h_3d-nt-ós*	*dat-ás*	*dantiēs*	*odónt-os*	*dent-is*	Goth. *tunþ-(u-)*

The Lithuanian word became an *i*-stem through the accusative, while in Gothic it became a *u*-stem. The *ē* of Latin is based on lengthening before *-ns*; Gr. *od-oús* is analogical. Lat. *dent-*, Goth. *tunþ-* < *-*dnt-*. Originally the inflection must have been *$h_3$éd-nt*, *h_3d-ént-m*.

Exactly the same pattern is displayed by (the original participle) 'willing, voluntary':

nom.   *u̯éḱ-ont(s)*   Skt. *uś-án*   Gr. *hek-ṓn*
acc.   *uḱ-ónt-m*   *uś-ánt-am*   *hek-ónt-a*
gen.   *uḱ-nt-ós*   *uś-at-ás*   *hek-ónt-os*

The participles in *-nt* (cf. G. *sing-end*; see Section 18.9.1) had the following inflection:

	PIE	Skt.	Gr.	Gr. *drak-*	Lat.	Lat.	Goth. *nasj-*
nom.	*-⁓ nt(s)*	*-an*	*-ōn*	*-eís*	*-ēns*	*i-ēns*	*-and-s*
acc.	*-ént-m*	*-ant-am*	*-ont-a*	*-ént-a*	*-ent-em*	*e-unt-em*	*-and*
gen.	*-nt-ós*	*-at-ás*	*-ont-os*	*-ént-os*	*-ent-is*	*e-unt-is*	*-and-is*

Here, too, Greek introduced *-ōn*, but only with verbs that had the stress on the stem (in contrast to *-eís* < *-*ént-s*). Latin is important here: *-ēns* (*ē* from secondary lengthening) might derive from *-ents*, but *iēns*, *euntis* 'going' has *-ont-* in the accusative, and suffixal *-e* in the nominative combined with *-o* in the accusative is in conflict with everything else that we know. The nominative must have had *-nt(s)*. This also explains the strange fact that the neuter has the same form (*-ēns*) as the masculine: in the neuter we expect *-nt*; the forms were thus identical, and when the masculine form acquired an *-s*, the neuter acquired it as well.

g.   *s*-stems
The word for 'dawn' and Lat. 'honor':

	PIE	Skt.	Gr.	Lat.
nom.	*h₂éus-ōs	uṣ-ā́s	ēṓs	honōs
acc.	*h₂us-ós-m	uṣ-ā́s-am	ēō <*ēoa	honōrem
gen.	*h₂us-s-ós	uṣ-ás	ēoũs < *ēoos	honōris

For *h₁su-men-és see further on the adjectives (Section 14.3).

This inflection is also found in the comparative:

	PIE	Skt.	Gr.	Lat.	OCS
nom.	*-́-iōs	kánī-yān	hēd-íōn	mel-ior	mьn-jьjь
acc.	*-iés-m	-yāṁs-am	-íō < *-ioa	-iōrem	-jьjь
gen.	*-is-ós	-yas-as	-íous < *-ioos	-iōris	-jьša

The *n* (*ṁ*) of Sanskrit is a later deviation. Sanskrit and Greek both, then, replaced
-ies- and *-is-* with *-ios-*. The form *-is-* is found in Germanic, Goth. *-is-an-*. Slav. *-jьš-* is
-is- with the *i* of *-iōs* (the *š* developed from a suffix *-io-*). Lith. *ger-ēs-nis* displays the
suffix in the form *-ies-*.

The perfect participle also provides important information, for example 'knowing':

		Skt. *vid*		Gr. *eid*
nom.	*uéid-uōs	-vā́n		-ṓs
acc.	*uid-uós-m	-vā́ṁs-am		(-ót-a)
gen.	*uid-us-ós	-úṣ-as		(-ót-os)

Here Sanskrit preserved the old ablaut in the genitive, etc. Greek exchanged *-o(h)-os*
for *-ot-os*; the variant *-us-* can still be found in fem. *iduĩa < *uid-us-ih₂*, Skt. *viduṣī́*.

Very old is the word for 'nose' (subtype 1):

		Skt.		Lat.	
nom.	*néh₂-s-s	nā́s-(ā)	Lith. *nós-(is)*	nār-(is)	
acc.	*nh₂-és-m	nas-(ós)	OCS *nos-(ъ)*		OHG *nas-a*
gen.	*nh₂-s-ós	-			*nas-a*

h.   *i*-stems

By way of illustration we give: Skt. *sákhā* 'ally'; Skt. *ávis*, Gr. *óis* 'sheep'; Gr. *peithṓ*
'persuasion'; Hitt. *zahhai-* 'battle':

		Skt.	Skt.	Gr.	Gr.	Hitt.
nom.	*-ōi, *-is	sákh-ā	áv-i-s	peith-ṓ	óis	zahh-ais
acc.	*-oi-m	-āy-am	-i-m	-ō	óin	-ain
gen.	*-i-os	-y-ur	-y-as	-oũs	oiós	-iĵas

Skt. *ávim*, Gr. *óin* are analogical after the PD inflection; *-is* is perhaps the oldest nominative (subtype 1).

i.   *u*-stems
Av. *uɣra-bāzāuš* 'with strong arms', *xratuš* 'will-power'; Gr. *hippeús* 'horseman', *pátrōs* 'uncle, father's brother'; Hitt. *harnau-* 'birthing chair':

		Av.	Av.	Gr.	Gr.	Hitt.
nom.	*-ē/ōus(s)*	*-bāz-āuš*	*xrat-uš*	*hipp-eús*	*pátr-ōs*	*harn-aus*
acc.	*-e/ou-m*		*(-um)*	*-ēa*	*-ōa*	*-aun*
gen.	*-u-os*	*-uuō*	*xraϑ-βō*	*-ēos*	*-ōos*	*-uu̯as*

The principle god of the Indo-European pantheon was 'Zeus':

nom.	**Di-ḗu-s*	Skt. *Dyaús*	Gr. *Zeús*	Lat. *(Iuppiter)*
acc.	*-ḗm*	*Dyā́m*	*Zēn(a)*	*Iovem*
gen.	*-u-ós*	*Divás*	*Diós*	*Iovis*

The divergent accusative **Diēm* (one expects *-eu-m*) must have come out of *-eum* or *-ēum* (with *ē* from the nominative).

j.   Laryngeal Stems
h₁-stems. — These are known from Latin, and especially from the PIE word for 'path':

nom.	**pont-eh₁-s*	Skt. *pánthās*	Av. *paṇtā̊*	Lat. *vātēs*
acc.	**pont-eh₁-m*	*pánthām*	*paṇtą̄m*	*vātem*
gen.	**pnt-h₁-ós*	*pathás*	*paϑō*	*vātis*
ins.pl	**pnt-h₁-bʰi*	*pathíbhis*	*padəbīš*	*vātibus*

We find this word in Gr. *póntos* 'sea' (thus the 'paths' of the sea), *pátos* 'path'; Lat. *pons* 'bridge'; Russ. *put'* < **pontis* (cf. *sputnik* 'traveling companion'); OPr. *pintis* < **pnt-*. (The origin of E. *path* is uncertain.) The *th* or *ϑ* from **tH*, the alternation *ā/i/Ø* < **eH/H/H* as well as the fact that the accusative ending in Indo-Iranian is disyllabic, all point to the presence of a laryngeal. Note the mobile stress in Sanskrit.

The comparison with Lat. *vātēs* makes it probable that the suffix contained **h₁*. In Latin this type gave rise to the fifth declension (*fidēs*, *māteriēs*), with generalization of *ē*.

h₂-stems. — These are the traditional *ā*-stems, which were very important in the IE languages, among other reasons because they served to form the feminine of the (*o*-stem) adjectives (see Section 14.2).

PIE **Hros-* 'humidity, dew'; Gr. 'carrying, burden', Lat. 'flight', OIr. 'people', Goth. 'gift':

	PIE	Skt.	OCS	Lith.	Gr.	Lat.	OI.	Goth.
SINGULAR								
nom.	$-h_2$	rasā́	rosa	rasà	phorā́	fuga	túath	giba
voc.	$-h_2e$?	rase	roso	rāsa				
acc.	$-eh_2m$	rasā́m	rosǫ	rāsą	phorā́n	fugam	túaith	giba
gen.	$-h_2os$	rasā́yās	rosy	rasõs	phorās	fugae	túaithe	gibos
dat.	$-h_2ei$	rasā́yai	rosě	rāsai	phorāi	fugae	túaith	gibai
loc.	$-eh_2i$	rasā́yām	rosě	rasojè				
ins.	$-h_2eh_1$	ras(áy)ā	rosojǫ	rasà				
PLURAL								
nom.	$-eh_2es$	rasā́s	rosy	rāsos	phoraí	fugae	túatha	gibos
acc.	$-eh_2ns$	rasā́s	rosy	rasàs	phorā́s	fugās	túatha	gibos
gen.	$-h_2om$	rasā́nām	rosъ	rāsų	phor(ā́)õn	fugārum	túath	gibo
dat.	$-h_2mus$	rasā́bhyas	rosamъ	rasóms		fugīs	túathaib	gibom
loc.	$-h_2su$	rasā́su	rosaxъ	rasosè	phoraĩs			
ins.	$-h_2b^hi$	rasā́bhis	rosami	rasomìs				

Singular. — Nom. The short *-a* of Latin versus **-ā* in most other languages has always been difficult to explain. The solution is perhaps that the ending was **-h₂*, not **-eh₂* (*-ā*). That would accord with the fact that the neuter plural ending was **-h₂*, of which it had always been assumed that it was the nom. sg. of the *ā*-stems, because the accompanying verb is in the singular. — Voc. Skt. *-e* (< **-ai*) is also problematic; the *-i* perhaps comes from (the nominative) **-h₂*. The old vocative may have been **-h₂+e* (cf. Section 13.2.10). (The earlier explanation was loss of the laryngeal due to a pause, **-eh₂ > -a.*) — Gen. The genitive, dative and locative of Sanskrit must have borrowed their *-y-* from the *ih₂*-stems. The reason for this was that in **-h₂-os* etc. the laryngeal was lost, so that the complete suffix disappeared. Old Irish also has *-e < *-ih₂os*. Lat. *-ae* has adopted the *-ī* of the *o*-stems. Another ending has been preserved in expressions such as *pater familiās*. OCS *-y* is perhaps analogical after the nom. pl. Elsewhere **-h₂-os* was replaced by *-ās*. — Dat. **-h₂ei > -ai* was replaced by *-āi*. — Loc. Lith. *-oje* contains the particle *-en* 'in'. The Sanskrit form is unclear. Greek has *-ai* in *akhurmiaí* '(through the) chaff'. — Instr. Skt. *-ayā* and OCS *-ojǫ* have been taken over from the pronouns.

Plural. — Nom. The Greek and Latin forms have been influenced by the ending **-oi* of the *o*-stems. OCS *-y* is the accusative form. — Gen. Balto-Slavic **-um < *-h₂om*. Elsewhere *-eh₂-* was introduced. That is why Skt. *-ām* in the Rigveda is usually disyllabic (*-n-* in *-ānām* has been taken over from the *n*-stems), while in Old Avestan it is always so. Lat. *-ārum < *-āsom* is the pronominal form. — Dat. etc. The remaining forms have **-eh₂-* instead of **-h₂-*. Lat. *-īs < *-ais* after the analogy of the *o*-stems.

Greek had the locative *-āsi* (for **-āsu*), OAtt. *tamíāsi*, *Athḗnēsi* 'in Athens'. The productive endings *-ēisi and -ais* developed under the influence of the *o*-stems. — Instr. Mycenaean has *-api*, as in *anijapi /anhiāpʰi/* 'with reins'.

iH-stems. — The same inflection is found when an *i* precedes the laryngeal in the suffix: *-i(e)H-*. It is not always clear when we are dealing with **h₁* and when with **h₂*; probably they were completely parallel and in some languages merged. Examples are: Skt. 'wolverine', OCS 'ship', Goth. 'band/persecution':

nom.	**-iH*	Skt. *vr̥kī́s*	OCS *ladii*	Goth. *bandi/wrakja*
acc.	**-ieH-m*	*vr̥kíam*	*ladьjǫ*	*bandja*
gen.	**-iH-os*	*vr̥kías*	*ladьję*	*bandjos*

In Sanskrit the zero grade *-iH-* was generalized. The same happened in Slavic, but in such a way that it occurred before the nominative and accusative endings (**-i, *-jǫ < *-jām*). Furthermore, Slavic and Germanic adopted *-jā-* in the genitive, etc. In Germanic *-ih₂* was pronounced after short stems as [*i̯h₂*], which was first replaced by *-i̯ā* and then became *-ja*: *wrakja*. The Skt. genitive *vr̥kías* is written as *vr̥kyàs* (with *-yà-* as 'independent svarita') in the texts.

uH-stems. — The *uH*-stems are completely parallel with Skt. *vr̥kī́s*:

nom.	**-uH*	Skt. *tanū́s* 'body'	OCS *svekry* 'mother-in-law'
acc.	**-ueH-m*	*tanúam*	*svekrъvь, -ovь*
gen.	**-uH-os*	*tanúas*	*svekrъve*

Exercise 33

Explain why the following sets of forms point to PIE hysterodynamic inflection. Also reconstruct the PIE preform of the bold-faced forms:

a. Gr. **arḗn**, gen. sg. **arnós** 'lamb' (stem **urh₁-n-*)
b. Skt. ins.sg. **bhīṣā́** to *bhiyás-* 'fear' (stem **bʰiH-s-*)
c. Hitt. nom.sg. **erhas** 'line, boundary', gen.sg. **arhas** (stem **h₁r-h₂-*)
d. Hitt. nom.sg. **hasterza** (<< **-tēr*), acc. **hasteran** 'star' (stem **h₂s-ter-*)

Exercise 34

The Tocharian B word for 'king' is nom.sg. *walo*, gen.sg. *lānte*. The same word has the form *ylai-* in the compound *ylai-ñäkte* (Toch. A *wlā-ñkät*) 'Indra', literally 'king-god'.

a. Toch. B *walo*, *lānte* continues a PIE *nt*-stem. Reconstruct the PIE form of the stem, using the phonological and morphological clues from the preceding chapters.

b. Which Tocharian sound law apparently led to the difference between nom.sg. *w*- and gen.sg. *l*-?

c. The stem to which *walo* belongs is regarded as hysterodynamic. To what extent does the attested form *wal-* in the nom.sg. deviate from the ablaut which you would postulate for PIE?

d. PIE **ue-* becomes *y(ä)-* in Toch. B. In view of this, can the compound *ylai-ñäkte* help you answer question c?

e. The same root is attested in Celtic, viz. in Gaulish *vlatos* 'ruler' and Old Irish *flaith* 'prince', albeit with the suffixes **-tó-* and **-tí-* instead of **-nt-*. In Celtic, long vowels were shortened in pretonic position. Reconstruct the ablaut of the root for these Celtic forms.

13.2.6 The proterodynamic inflection

a. *i*- and *u*-stems

The proterodynamic inflection (= PD) is in origin that of the neuters, but the *i*- and *u*-stems also have masculine-feminine forms as well as adjectives. We illustrate the inflection by means of the *u*-stems (**suHnu-* 'son', Hitt. 'good', Gr. 'arm', Lat. 'harbor', OIr. 'voice'):

	Skt.	OCS	Lith.	Hitt.	Gr.	Lat.	OIr.	Goth.
	sūn-	*syn-*	*sūn-*	*ass-*	*pḗkh-*	*port-*	*guth*	*sun-*

SINGULAR

	Skt.	OCS	Lith.	Hitt.	Gr.	Lat.	OIr.	Goth.
nom.	*-ús*	*-ъ*	*sūnùs*	*-us*	*-us*	*-us*	*guth*	*-us*
voc.	*-o*	*-u*	*sūnaũ*	*-us*	*-u*	*-us*	*guth*	*-(a)u*
acc.	*-úm*	*-ъ*	*sū́nų*	*-un*	*-un*	*-um*	*guth*	*-u*
gen.	*-ós*	*-u*	*sūnaũs*	*-auas*	*-eos*	*-ū́s*	*gotho*	*-aus*
dat.	*-áve*	*-ovi*	*sū́nui*	*-aui*	*-ei*	*-uī́*	*guth*	
loc.	*-áu*	*-u*	*sūnujè*					*-au*
ins.	*-unā*	*-ъmь*	*sūnumì*	*-auet*				

PLURAL

	Skt.	OCS	Lith.	Hitt.	Gr.	Lat.	OIr.	Goth.
nom.	*-ávas*	*-ove*	*sū́nūs*	*-auēs*	*-ees*	*-ū́s*	*gothae*	*-jus*
acc.	*-ū́n*	*-y*	*sū́nus*	*-amus*	*-eas*	*-ū́s*	*guthu*	*-uns*
gen.	*-ū́nām*	*-ovъ*	*sūnū̃*	*-auas*	*-eōn*	*-uum*	*gothae*	*-iwe*
dat.	*-úbhyas*	*-ъmъ*	*sūnùms*	*-auas*		*-ibus*	*gothaib*	*-um*
loc.	*-úṣu*	*-ъxъ*	*sūnuosè*		*-esi*			
ins.	*-úbhis*	*-ъmi*	*sūnumìs*	*-auet*				

PIE sg. *-*u-s* pl. *-*eu-es*

*-*eu*   *-*eu-es*

*-*u-m*   *-*u-ns*

*-*ou-s*   *-*eu-om*

*-*eu-i*   *-*u-mus*

*-*ēu*   *-*u-su*

*-*u-h*$_1$ *-*u-b*^{h}*i*

Singular. Gen. Balto-Slavic, Hittite and Gothic point to *-*ou-s*; for an explanation of the *o*-grade see 13.2.10. Hittite and Greek have replaced *-*s* with *-*os* from the HD type. — Dat. Slav. -*ov*- < *-*eu*. — Loc. *-*ēu* is probably the bare stem in -*eu*, which was lengthened at the end of the word. (Lith. -*e* is the particle *-*en*.) — Instr. Skt. has -*nā* of the *n*-stems. OAv. *vohū* < -*u-h*$_1$ is a static form; one would expect to see -*eu-h*$_1$ (for which see under d. *n*- stems).

Plural. Nom. The Lithuanian form is analogical. Latin has the accusative ending. Goth. *-*eues*- > *-*eus* > *-*ius* > -*jus*. — Acc. The long *ū* of Sanskrit is analogical. The endings of Hittite and Greek are also analogical. — Gen. Goth. -*iwe* goes back to *-*eu*- with the Gothic ending -*e* (see 10.5.2).

The PD *i*-stems are completely parallel.

b.   Laryngeal Stems

h_2-stems. — There is only one word known with the suffix -eh_2- that has the PD inflection, namely the word for 'wife':

nom.	PIE	*g^wen-h_2	Skt.	*jánis* (*gnā́*)	OIr.	*ben*
gen.		*g^wn-eh_2-s		*gnā́s* (*jányur*)		*mná*

Here the Old Irish inflection is the oldest. In Indo-Iranian the nom. *jáni*(-) became an *i*-stem, and the gen. *gnā́s* became an *ā*-stem. The word survives in many languages: OCS *žena*, OPr. *genno*, Arm. *kin*, Toch. A *śäṃ*, Toch. B *śana*, Gr. *gunḗ* (Boet. *banā́*; *gunḗ* has a deviant genitive, *gunaikós*, probably in origin an adjective ['of a woman']), Goth. *qino*; Goth. *qens*, E. *queen* go back to *$g^wēn$-.

ih₂-stems. An important category are the PD ih_2-stems. The feminine of the adjectives is formed on this basis, e.g. with the -*nt*- participles (Skt. 'goddess', Lith. 'bride', Gr. 'table'):

nom.	PIE *-ih_2	Skt. *dev -ī́*	Lith. *martì*	Gr. *trápeza*
acc.	*-ih_2-m	*-ī́m*	*mařčia*	*trápezan*
gen.	*-ieh_2-s	*-yā́s*	*marčiōs*	*trapézēs*

Acc. The Lithuanian form is analogical.

For the participles, compare:

Skt. *bhárantī*, OCS *nesǫšti*, Gr. *phérousa* fem. 'carrying'
OCS -*ǫšt*- < -*onti̯*-; Gr. -*ousa* < -*onti̯a* < *-*ontih₂*.

c.   *s*-stems

The neuter *s*-stems took the PD inflection (*neb^h- 'cloud, heavens', *$génh_1$- 'lineage, clan', OIr. 'house', Goth. 'darkness'):

	PIE	Skt.	OCS	Hitt.	Gr.	Lat.	OIr.	Goth.
	ján-	*neb-*	*nep-*	*néph-*	*gen-*	*tech*	*riq-*
SINGULAR								
nom.	*-os	-as	-o	-is	-os	-us	tech	-is
gen.	*-és-os	-as-as	-es-e	-is-as	-e-os	-er-is	tige	-iz-is
PLURAL								
nom.	*-és-h_2	-āṁsi	-es-a		-e-ā	-er-a		
gen.	*-és-om	-as-ām	-es-ъ	-is-an	-é-ōn	-er-um		

Singular. Nom. In Hittite and Gothic *-*os* was replaced by *-*es*.

Plural. Several languages point to *-es-h$_2$. The ending *-h$_2$ is identified with the nom. sg. ending of the *ā*-stems. Furthermore, Av. *-ā̊* < *-ās, Skt. *-āṁsi* (with secondary *-m-* and *-i* < *-h$_2$*) points to an ending *-ōs. It is assumed that this form was also originally a nom. sg. (of the HD inflection) with collective meaning (13.2.3). It would seem that the neuter had no plural form.

Since the genitive has *-és- this type must have been PD. Probably the original inflection was *néb^h-s, gen. *n(e)b^h-és-s (thus precisely as *-u, *-éu-s). Subsequently, nom.sg. *-s was replaced by *-es, which became *-os because it was unstressed (see Section 12.3). In the gen.sg., *-es-s would become *-es; its replacement by *-es-os is therefore understandable.

d. *n*-stems.

Most of the PD *n*-stems have the suffix *-men- (*h$_3$nh$_3$-mn- 'name'; OAv. *haxman-* 'community', *cašman-* 'eye', *afšman-* 'verse'); OAv. *sāx^{v}an-* 'teaching' has *-uen-, Gothic *hairto* 'heart' < *-en-:

	PIE	Skt.	OAv.	OCS	Gr.
			SINGULAR		
nom.	-mn̥	nā́ma	haxmā	imę	ónoma
gen.	-men-s	nā́mnas	haxmǭṇg	imen-e	onómat-os
dat.	-men-ei	nā́mne	haxmaini	imen-i	onómat-i
loc.	-mēn	nā́mani	cašmąm	imen-e	
ins.	-men-h$_1$	nā́mnā	cašmaini	imen-ъmь	
			PLURAL		
nom.	-mōn	nā́māni	haxmąm; afšmāni		
	-men-h$_2$	(nā́mā, -a)	sāx^{v}ə̄nī	imen-a	onómat-a

Lat.	Goth.	OIr.
	SINGULAR	
nōmen	hairto	ainm
nōmin-is	hairtins	anm(a)e
nōmin-i	hairtin	anm(a)im(m), ainm(m)
nōmine		
	PLURAL	
	hairtona	
nōmina		anman(n)

Singular. Nom.-acc. Goth. *-o* is analogical, after the plural. — Gen. Only Avestan and Old Irish reflect the original PD ending *-én-s* (> PIr. *-anh* > OAv. *-əng*, YAv. *-ən*). — Loc. Only Avestan has the original ending *-mēn* (*-n* was assimilated to the preceding *-m-*). — Instr. Avestan is again unique; it preserves the expected PD form *-én-h₁ (*-an-* automatically becomes *-ain-* before the following *-i*). — Note that Sanskrit has HD endings, *-n-os*, etc. Greek *-t-* is still a puzzle.

　　Plural. nom. PIE must have had *-ōn* (Sanskrit added *-i* < *-h₂* as did Avestan in *-māni*) and *-en-h₂* is easily understandable as an innovation: stem + ending; further *-h₂* was mostly replaced by *-ā* < *-eh₂* from the *o*-stems.

e. *r/n*-stems

An archaic inflection is displayed by neuters of which the stem has *-r* in the nominative, but *-n-* elsewhere. Such alternating stems are called heteroclitic. We find the following forms (Skt., Gr., Lat. 'liver', Skt. 'day', OAv. 'instruction', Hitt. 'fire', OIr. 'grain'):

	PIE		Skt.		OAv.	Hitt.
nom.	*iékʷ-r*	*péh₂-ur*	yák-r̥-t	áh-ar	rāz-arə	pahh-ur
gen.	*i(e)kʷ-én-s*	*p(e)h₂-uén-s*	yak-n-ás	áh-n-as	rāz-əng	pahh-uen-as
			Gr.	**Lat.**	**OIr.**	
nom.			hēp-ar	iec-ur	arb-or	
gen.			hḗp-at-os	iec-in-oris	arb-(a)e	

Nom. Skt. *-ar*, OAv. *-arə* < *-r̥*. Skt. *-t* is unclear; it must be the same *t* which we also find in Gr. *-at-* < *-nt-*. The long *ē* in Greek *hēpar* is analogical. — Gen. Sanskrit has a HD genitive, Avestan the old PD one, *-əng* < *-éns*. Hittite replaced *-s* with *-as* < *-os*. Latin has added *-or-* (from the nominative). — See also 13.2.7.

　　There is one word with *l/n*: *séh₂-ul*, gen. *sh₂-uén-s* 'sun', in Skt. *svàr* (= *súar*), Av. *huuarə*, gen. *xᵛə̄ŋg*, Lat. *sōl*.

Exercise 35

Here are two paradigms of Skt. words which both go back to the PIE stem *gʷen-h₂*- 'woman, wife'. The bold-faced forms are the ones that directly continue a PIE preform:

nom.sg.	***jánis***	'wife'	gnā́	'lady, goddess'
acc.sg.	***jánim***		gnā́m	
gen.sg.	*jányus*		***gnā́s***	

a.　Reconstruct the PIE form of the bold-faced words.

b.　Explain why the original paradigm split in two in Sanskrit. Also explain how the normal-type forms arose.

Exercise 36

It is often the case that a PIE suffix is not retained in the individual languages in the inherited form, although that original form can still be recognized behind the later extensions. Reconstruct the heteroclitic stem which lies at the basis of the following correspondence: Gr. *éar* 'spring', Lith. *vāsara* 'summer', OCS *vesna* 'spring', Av. *vaŋri* (< IIr. **was-r-i*) 'in spring', Skt. *vasantá-* 'spring'. Reconstruct the probable nom.sg. and gen.sg. of the PIE noun.

Exercise 37

All of the case forms from *i-* and *u-*stems given below have endings of the hysterodynamic type. Reconstruct the expected PIE form of suffix + case ending for each form:

a.   Skt. *krátvaḥ* [gen.sg.] 'magical force'   *krat-u-*
b.   Gr. *grāós* (< **grāwos*) [gen.sg.f.] 'old woman'   **graH-u-*
c.   Skt. *pátye* [dat.sg.m.] 'husband'   *pat-i-*
d.   Gr. *Diós* [gen.sg.m.] 'Zeus'   **di-u-*
e.   Skt. *gáve* [dat.sg.f.] 'cow'   **g^wh₃-u-*
f.   Gr. *pēkheos* (< **pākhewos*) [gen.sg.] 'arm'   **b^hh₂ǵ^h-u-*
g.   Skt. *ávyaḥ* [gen.sg.f.] 'sheep'   *av-i-*
h.   Skt. *dyā́m* [acc.sg.m.] 'god'   **di-u-*

Exercise 38

Determine for the following forms whether they point to HD or PD inflection. All go back to PIE *u-*stems.

a.   Av. *yāϑβa* [ins. sg. m.] (< **yātwā*)   to   Av. *yātu-* 'sorcery'
b.   Goth. *faihaus* [gen. sg. n.]   Goth. *faihu* 'money'
c.   Av. *nasāum* [acc. sg. f.] (< **nasāwam*)   Av. *nasu-* 'corpse'
d.   Lat. *senātūs* [gen. sg.] (< **-tou-s*)   Lat. *senātus* 'senate'
e.   Av. *-fšauue* (in compounds) [dat. sg. m.] (< **-fśawai*)   Av. *pasu-* 'cattle'
f.   Hitt. *harnuu̯as* [gen.sg.]   Hitt. *harnu-* 'birthing chair'

13.2.7   The static inflection

Of the static inflection only one paradigm remains in Indo-Iranian, and this in some participles, namely from: the reduplicated present (*dádat-* < **dé-dh₃-nt-* 'giving'), the *s*-aorist (*dhák-ṣ-at-* 'burning') and the static present (*śás-at-* 'instructing'). This type had the accent always in the same place, viz. on the root (or the reduplication), while the suffix had the zero grade:

PIE   *-nt(-s)   Skt. *dá-d* -at
       *-nt-m   -at-am
       *-nt-s   -at-as

It follows that Sanskrit has replaced the genitive ending *-s with -as.

Other traces of this inflection type are rare. A certain example is the word for 'mother' (sometimes the word for 'father' has partially taken over this inflection):

	PIE	Skt.	Av.	OIc.	OE
nom.	*$méh_2$-tr̥	(mātā́)		(faþer)	(fæder)
gen.	*$méh_2$-tr̥-s	mātúr		fǫþor	-fadur
acc. pl.	*$méh_2$-tr̥-ns		mātərą̄š		

The genitive has -tr̥-s. This form must be old, because a secondary origin is unthinkable. The acc. pl. Av. -tərą̄š [-tr̥̄š] /-tr̥ns/ goes back to -tr̥-ns. The accent (cf. Gr. mḗtēr; in Sanskrit it has shifted on the model of 'father') and the full grade of the root (as against the zero grade of 'father', *ph_2-tēr) confirm this reconstruction. — The word for 'mother' has adopted the nominative ending of 'father' everywhere. In Sanskrit and Germanic, however, 'father' received the genitive ending of 'mother'.

Another case of static inflection is probably the word for 'night'. Hitt. *neku-^{zi}* 'to become evening' and gen.sg. *nekuz* < *$neg^{w(h)}$-t-s* 'at night' have *e*-grade whereas the other languages (Lat. *nox, noctis*, Goth. *nahts*, Gr. *núks*) require an *o*-grade *$nog^{w(h)}$-t-s*. It is commonly supposed that the PIE nominative had *-o- and the genitive *-e- but this is uncertain.

Static inflection has also been assumed for the word 'knee'. It is found with *o*-grade (Gr. *gónu*) and *e*-grade (Lat. *genu*). This suggests the following inflection:

nom. sg.   *ǵón-u
gen. sg.   *ǵén-u-s

The PD inflection has *-uh_1 in the instrumental case. This form is probably taken over from the static inflection, because both suffix and ending have the zero grade -u-h_1.

13.2.8 Root nouns

Because root nouns do not have suffixes (that is why they are called root nouns), there can only be two accent types: either the accent was always found on the root, or it moved between the root and the ending. One may call the first type 'static' and the second one 'HD' (or simply 'mobile'). In the accusative there was no difference between static and HD, because there was no suffix and the accusative ending (-*m*) could never be accented. The two types look as follows:

	STATIC	HYSTERODYNAMIC
nom.	–́ (s)	–́ (s)
acc.	–́ (m)	–́ (m)
gen.	–́ s	– ós

Because the nominative was always monosyllabic, it mostly shows a long vowel.

It is difficult to distinguish the two types in reconstruction since in most languages both the root ablaut and the form of each case ending became generalized.

a. Static

Masculine-feminine. The word for 'foot' has *ō, o* (Goth. *fotus*, Gr. *pód-a*) and *ē, e* (Lat. *pēs*, *pedis*). Here the static inflection is obvious:

nom. masc.	*pṓd(s)*	*uók̑ʷ-s*	ntr.	*dṓm*
acc.	*péd-m*	*uók̑ʷ-m*		*dṓm*
gen.	*péd-s*	*uók̑ʷ-s*		*dém-s*

It can easily be understood why the ablaut *ō/e* was replaced by *ō/o*. This may perhaps explain: Lat. *vōx* 'voice', Gr. dat *op-í*.

Neuters. The word for 'house' had *ō* (Gr. *dō, dōma*, Arm. *tun*); an *-e-* is found in the old genitive **dems*, which is present in the (pseudo-)compound Gr. *despótēs* 'lord of the house' (cf. Av. *də̄ŋg paitiš*).

b. Hysterodynamic

Masculine-feminine. If the root displays a zero grade, the word must have been of the HD type. So for example, **h₃bʰr(ē)uH-* 'eyebrow', OHG *brāwa*, Skt. *bhrū́s*, OCS *brъvь*, Gr. *ophrūs*. Probably the word for 'foal' was also an HD word, Gr. *pōlos*, Goth. *fula* (*n*-stem; E. *foal*), OIc. *fyl < *fulia*, PGm. **ful- < *pl̥H-*:

nom. PIE	**h₃bʰr̥̄́uH-s*		**pólH-s*
acc.	**h₃bʰréuH-m*		
gen.	**h₃bʰruH-ós*		**plH-ós*

In this way we may also explain Gr. *p(t)ólis* 'city', Skt. *púr, púr-am*, Lith. *pilìs*, forms which point to PIE **tpolH-/*tplH-*. Of the same type seems to have been Hittite *kāsza* /kāst-s/ 'hunger' < **gʰósd-*, since the derivatives *kist-ant-* 'hunger', *kist-u̯ant-* 'hungry' point to **kst- < *gʰsd-*.

In the same manner the inflection of the word for 'one' must be explained:

nom. PIE	*sṓm	OCS *samъ*	Gr.	*heîs*	
acc.	*sém-m			*hén-a*	
gen.	*sm-ós			*hen-ós*	
dat.	*sm-éi			*hen-í*, Myc. *eme* /hemei/	
loc.	*sḗm(i)				

The root *sem-* we also find, for example, in Latin *sem-el* 'once', *simplex* 'simple'; OCS *samъ* means 'self'. Mycenaean /hemei/ has the older dative ending. The loc. *sēmi* probably survives in Lat. *sēmi* 'half' < 'one of the two'.

Under the reduplicated nouns (13.1.3) we saw that some of them were perhaps root nouns, for example:

*bʰé-bʰr	*kʷé-kʷl
	*kʷ-kʷél-m
*bʰi-bʰr-ós	*kʷi-kʷl-ós

The accusative of 'wheel' is perhaps found in OPr. *kelan*, OIc. *hvel*, with *kʷel-o-* based on *kʷkʷel-* (hence maybe derives Gr. *kúklos* too). But this reconstruction is still uncertain. For the alternation between *e and *i in reduplication, see Section 18.1.3.

Only the zero grade is known for a number of words, for example Lat. *vīs* 'power', PIE *uiH-; *muH-s* 'mouse'.

Neuters. A clear case seems to be *ḱērd 'heart', gen. *ḱrd-ós. One does not expect to see HD inflection for neuter words. It is possible that the old stem of the oblique cases was *ḱred-, as in Skt. *śrad-dhā* 'trust'. In that case, the word would not be a root noun but a *d*-stem: *ḱēr-d, *ḱr-ed-s.

Exercise 39

Reconstruct the PIE preform of the given case-forms:

a.   Myc. *a-ma-si* /harmasi/ dat.pl. 'with wheels' (stem *h₂r-mn-, PD)
b.   Lat. *sopōrī* dat.sg. 'sleep' (*suep-s-, HD)
c.   OCS *slovesъ* gen.pl. 'words' (*ḱleu-s-, PD)
d.   Skt. *sákhīn* acc.pl. 'friends' (*sokʷH-i-, HD)
e.   Skt. *rathías* (= *rathyàs*) gen.sg. 'charioteer' (*Hróth₂-iH-, HD)
f.   Skt. *yatyā́s* gen.sg. 'going' (*h₁i-nt-ih₂-, PD, fem. of pres.ptc. *yant-*)
g.   Hitt. *eshar* nom.sg., *ishanas* gen.sg. 'blood' (*h₁esh₂-r/n-)
h.   OE *brōþor* gen.sg. 'brother' (*bʰreh₂-tr-, S)

Exercise 40

Reconstruct the PIE stem of the following words. To which category of stems do they belong?

a. Gr. nom.sg. *sūs*, acc.sg. *sūn*, gen.sg. *suós* 'swine'
b. Skt. *spáś-* m. 'spy'
c. Skt. (*dharma-*)*vid-* 'knowing (the law)'
d. Gr. nom.sg. *klṓps*, gen.sg. *klōpós* 'thief' (to *kléptō* < *klep-je-* 'to steal')

Exercise 41

Translate into PIE (the stem of each noun is given):

a. 'The sons (*suH-nu-, HD) of a poet (*ueh_2t-h_1-, HD)'
b. 'In winter (*$ǵ^hei$-m-) (it is) food (*h_1ed-mn-, PD) for the dogs (*$ḱu$-n-, HD)'
c. 'With trees (*dor-u-, PD) of acorns (*g^welh_2-n-, HD)'
d. '(She hits) the thief (*b^hor-, S) with metal (*h_2ei-s-, PD)'
e. 'A lover (*keh_2-us-, HD) of liver (*iek^w-r/n-, PD)'

13.2.9 The o-stems

The o-stems occupy a special position in the Indo-European inflection system. Firstly, they are stems in a vowel (since *i*- and *u*-stems must be seen as consonant stems). Secondly, they have no ablaut as the consonant stems do. Thirdly, they have special endings (*ulk^w- 'wolf', Hitt. 'sea'; ntr. 'yoke'):

Masculine/Feminine

	PIE	Skt.	OCS	Lith.	Hitt.	Gr.	Lat.	Goth.
	*ulkʷ-	vŕ̥k-	vlьk-	vil̃k-	arun-	lúk-	lup-	wulf-
SINGULAR								
nom.	*-os	-as	-ъ	vil̃kas	-as	-os	-us	-s
voc.	*-e	-a	-(č)e	vil̃ke		-e	-e	-Ø
acc.	*-om	-am	-ъ	vil̃ką	-an	-on	-um	-Ø
gen.	*-os	-asya			-as	-oio	-ī	-is
abl.	*-ōd	-ād	-a	vil̃ko	-az		-ō(d)	
dat.	*-ōi	-āya	-u	vil̃kui	-i	-ōi	-ō	
loc.	*-oi	-e	-(c)ě	vilkè	-i	-oi	-ī	
ins.	*-oh₁	-eṇa	-omь	vilkù	-it			-a
PLURAL								
nom.	*-ōs	-ās	-(c)i	vilkaĩ	-es	-oi	-ī	-os
acc.	*-ons	-ān	-y	vilkùs	-us	-ous	-ōs	-ans
gen.	*-om	-ānām	-ъ	vilkų̃	-an	-ōn	-ōrum	-e
dat.	*-omus	-ebhyas	-omъ	vilkáms	-as			-am
loc.	*-oisu	-eṣu	-(c)ěхъ	vilkuosè	-as	-oisi		
ins.	*-ōis	-ais	-y	vilkaĩs	-it	-ois	-īs	

Neuter

	PIE	Skt.	OCS	Hitt.	Gr.	Lat.	Goth.
		yug-	ig-	iug-	zug-	iug-	juk-
SINGULAR							
nom./ acc.	*-om	-ám	-o	-an	-ón	-um	Ø
PLURAL							
nom./ acc.	*-h₂	-ā̇́	-a	-a	-á	-a	-a

Singular. Nom. see acc. — Acc. Balto-Slavic *-om became *-um. Baltic replaced *-ų with -ą; in Slavic *-um became -ъ. On this basis the nominative -os was replaced by *-us > -ъ. — Gen. Balto-Slavic has *-ād, which replaces abl. sg. *-ōd. The Germanic ending *-eso comes from the pronouns. Italo-Celt. -ī < *-iH is probably (the nom. sg. of) an adjectival suffix. Sanskrit, Armenian and Greek point to *-osio. This form is now also found in Latin (or a closely related dialect), in the second oldest inscription, that of Satricum: *Popli-osio* 'Publi-ī'. This form must be old, because it is not clear how it could have come into being independently in these languages. But Hittite has *-os, which must also be old, because obviously this ending cannot have a secondary

origin (the creation of an ending that is identical to another, here the nominative, is improbable). It is easy to understand that *-os was displaced by *-osio. This form must have come from the pronouns. — Abl. *-ōd could derive from -o + -ed (PIE *-oh₁ed). — Dat. It is assumed that *-ōi has come out of *-o + *-ei. Sanskrit has added a particle. — Loc. Celtiberian (the inscription of Botorrita) has a locative in *-ei, which we also find in Oscan. It may come from the pronouns. — Instr. Lith. *vilkù* (OHG *wolfu*) points to *-oh₁.

Plural. Nom. Balto-Slavic, Greek, Latin and Celtic have the pronominal ending *-oi. Nom. *-ōs must represent *-o + *-es. In Indo-Iranian and Germanic, we also find what may be the older variant *-os-es (Skt. -āsas, Av. -ā̊ŋhō, OFr. -ar) from the addition of *-es to sg. *-os. — Acc. Sanskrit points to *-ōns but Avestan to *-ons; the long vowel may have been adopted from the nominative. The Lithuanian form, with its acute accent, points to *-oHns (with -H- from the laryngeal stems?). — Gen. Balto-Slavic and Old Irish point to *-om; the other forms are either indecisive (Hittite) or innovations; see Section 13.2.3. Lat. -ōrum is from the pronouns. — Loc. *-oisu has -oi- from the pronouns. — Instr. This ending has no parallel in the consonant stems. Perhaps it has been taken over from the pronouns.

Neuter. — Nom. pl. The short -a of Greek and Latin points to *-h₂. This form, then, is not an o-stem.

We thus get the following picture:

nom. sg.	*-os	pl.	*-ōs < -oh₁es < -o-es
acc.	*-om		*-ons < -o-ns
gen.	*-os		*-om
abl.	*-ōd < -oh₁ed < -o-ed		*-o-ios?
dat.	*-ōi < -oh₁ei < -o-ei		*-o-mus
loc.	*-oi < -o-i		*-oisu
ins.	*-oh₁ < -o-h₁		*-ōis < -oh₁eis < -o-eis?

For the explanation of this inflection see the following section.

> **Exercise 42**
>
> Determine case and number of the following forms (sometimes more than one answer is correct):
>
> a. *$\acute{g}omb^hos$
> b. *$ur\acute{g}oi$
> c. *$supnoisu$
> d. *$por\acute{k}ons$
> e. *$uo\acute{g}^hnelom$
> f. *$uiHr\bar{o}d$
> g. *$h_1rud^hr\bar{o}is$
> h. *peh_3tloh_1
>
> If you can, try also to distinguish the PIE root from the suffix in the above forms.

> **Exercise 43**
>
> Translate into PIE (the stem of each noun is given):
>
> a. 'To the hero (*$uiHro$-) of the match (*$pert\text{-}tlo$-)'
> b. 'On the wagon (*$uo\acute{g}^ho$-) of dreams (*$suepno$-)'
> c. '(They are) white (*$\acute{k}uitno$-) bears (*$h_2rt\acute{k}o$-)'
> d. '(They lure) the wolf (*ulk^wo-) with pigs (*$por\acute{k}o$-)'

13.2.10 The historical relation between the inflectional types

The nominative type *CéC-ōR* of the HD inflection (*$n\acute{e}p\bar{o}t$) is remarkable for its ablaut, for it has a — long! — vowel after the stress. It has been thought that the original form was *CéC-R*, with the zero grade that one would expect after the stress. Such forms seem indeed to be demonstrable, especially in the *ā*-stems (nom. *CéC-h_2* > Lat. *-a*). The form in *-ōR* must have developed because the full grade of the suffix in the accusative (*CC-éR-m*) was carried over into the nominative. There the unstressed vowel was transformed to *-o-*, and *-oR* was then phonetically lengthened to *-ōR*. — In cases where the whole stem of the accusative (*CC-éR*) was carried over into the nominative, the (accented) *-é-* was preserved, but it was also lengthened; this gave the type *CC-ḗR*, for example *$ph_2\text{-}t\acute{e}r$.

The insight that (1) the nominative of the HD inflection had zero grade *-R* (without *-s*), and (2) that the HD inflection characterized masculine and feminine words, while the PD inflection belonged to neuter words, presents a problem, namely that the nominatives of both types were identical:

proterodynamic	hysterodynamic
CéC-R *médʰ-u	*CéC-R *dʰégʰ-m*

The strange thing is that the masculine/feminine words originally had the same nominative as the neuters, though later on they were very strictly distinguished, cf. Skt. *svād-ús* : ntr. *-ú*; *sumanā́s* : ntr. *sumanás*. This raises the questions of (1) how it can be that these nominatives were identical, and also (2) where the nominative *-s* came from.

The answer (to both questions) is probably that PIE had an ergative system. Such systems have an ergative (case) for the subject of transitive verbs, and an absolutive case for the subject of intransitive verbs and the object. That is to say: there is a separate case which indicates the agent; with intransitive verbs such as 'lie' and 'sit' the subject is not treated as an agent but as a patient. Ergative case-marking is found in many languages of the world. In Europe it is rather rare: apart from Basque, ergatives mainly occur in Caucasian languages. Compared with the nominative system that we know, an ergative system looks as follows:

		nominative system	*ergative system*
transitive verb:	subject	nominative	ergative
	object	accusative	absolutive
intransitive verb:	subject	nominative	absolutive

It goes without saying that the neuters, mostly words for inanimate things, were found in the absolutive, but never or rarely in the ergative. This explains the fact that the nominative and the accusative case of PIE are identical with neuters, since both continue the absolutive. The absolutive often has no ending. The masculine/feminine words, by contrast, are found in both cases. They changed the older opposition of ergative : absolutive into nominative : accusative. These considerations lead us to think that the nom *CéC-R* was an old absolutive.

The question then remains: which attested PIE case continues the earlier ergative? It has long been suspected that the nom. *-s* was an ergative ending. The ergative, then, probably ended in *-s*. In many languages the genitive serves as ergative, and this was *-os* in the HD inflection. It seems very probable, then, that the genitive originally functioned as an ergative.

The nom. *-s*, which thus must be explained as having derived from *-os*, cannot have come into existence in the PD inflection (where the gen. was *-éR-s*), because these were neuters. Therefore *-s* must have developed in the static inflection, the type with gen. *méh₂-tr-s* 'mother'. The masculine/feminine *i-* and *u-*stems also probably had, in origin, a static inflection, as shown by their nom.sg. *-is*, *-us*. The *o*-grade of gen. *-ou-s* points in the same direction, since an original PD gen. would be *-éu-s*;

the unaccented full grade was adopted from the PD stems in order to differentiate nom.sg. and gen.sg. If this happened at stage 2 of the ablaut system (see Section 12.3), *o*-vocalism in *-*ou-s* would ensue automatically.

A very important confirmation of this reconstruction is that the origin of the *o*-stems can now be explained. It is understandable that the ergative (ending) *-*os* became a nominative. This interpretation also explains the strange fact that the genitive of the *o*-stems was *-*os*. Their late origin would also explain why the *o*-stems do not display ablaut. It is also clear from this explanation why there are *o*-stems but no *e*-stems. Finally, the explanation given here is able to derive the *o*-stem inflection out of the HD inflection, for example *-*ōi* < *-*o-ei*.

It is now evident that the HD and the PD inflection systems, which both shared a mobile accent and the same endings, must have come out of one system, of which the neuters (PD) were just those words that were not found in the ergative. (Whenever neuters were used as actors, they probably took the instrumental ending *-*t*, see 13.2.2 on "Instrumental and ablative in Hittite".)

This conclusion about (Pre-)PIE syntax was already drawn by C.C. Uhlenbeck in 1901 and Holger Pedersen in 1907, that is, before Hittite was deciphered. Its plausibility has been beautifully confirmed by the recent analysis of PIE inflexional patterns.

13.2.11 The dual

	PIE	Skt.	Av.	OCS	Lith.	Gr.	OIr.
nom. masc./fem.							
C-st.	*-h_1e	-ā(u)	-a	-i	-e	-e	*-e
u-st.	*-h_1	-ū	-u	-y	-ù	-ei	*-ū
o-st.	*-h_1	-ā(u)	-a, -ā̊	-a	-ù	-ō	
eh$_2$-st	*-ih_1	-e	-e	-ě	-i	(-ā)	*-ai
nom. ntr.							
C-st.	*-ih_1	-ī	-i	-ě		-e	
o-st.	*-ih_1	-e	-e	-ě		(-ō)	
gen.	*-h_1e/oHs?	loc.	-ā̊	loc.	loc.	loc.	
loc.	*-h_1ou	-os	-uuō	-u	-aũ	-oiin	
dat.	*-me/oH??	-bhyām	-biia	-ma	-m	-oiin	
ins.	*-b^hih_1?		= dat.		-m̃		
abl.	always/everywhere = dat.						

As indicated, the reconstruction of the dual is very difficult, because the data is limited and quite disparate in nature. Nevertheless, we shall make the attempt.

Examples:
Nom. masculine/feminine:

   C-stems: Skt. *pitár-ā/-au*, Av. *gauu-ā* 'cows', Lith. pf. ptc. *áugus-e*, Gr. *patér-e*, OIr. *athir*.
   u-stems: Skt. *sūnū́*, Av. *mainiiu* 'spirits', OCS *syny*, Lith. *sū́nu*, OIr. *guth* 'voices'.
   o-stems: Skt. *vŕ̥kā/-au*, OCS *boga* 'gods', Lith. *vilkù*, Gr. *híppō* 'horses'.
   ā-stems: Skt. *śípre* 'lips', OCS *rǫcě*, Lith. *rankì* 'hands', OIr. *mnaí* 'women'.

Nom. neuter:

   C-stems: Skt. *nā́manī*, OCS *imeně* 'names', Gr. *génei* < *-es-e.
   o-stems: Skt. *yugé*, OCS *izě*, Gr. *zugṓ* 'yokes'.
Gen. Av. *narā̊* 'men'.
Dat. Skt. *sūnúbhyām*, Av. *nərəbiia*, OCS *synъma*, Lith. *sūnùm*, instr. *-um̃*.
Loc. Skt. *jánasos*, Av. *aŋhuuō* 'life', OCS *slovesu* 'words', Lith. *dvíejau* 'in two';
   o-stems: *-oi-h₁ou* (?): Skt. *áśvayos*, Av. *zastaiiō* 'hands', Gr. *híppoiin*.

Nom. = voc. = acc. Masc.-fem. The *o*-stems point to *-ō, which must go back to *-oH on account of the Lithuanian acute. This means that the ending was *-H. In the *u*-stems, too, *-ū must go back to *-uH (Gr. *-ei* < *-eu-e). The *ā*-stems had *-ai, which must have been *-eh₂-iH. Gr. *-ā* is analogical after the *o*-stems; the oldest forms even had the ending *-ō* of the *o*-stems. Lith. *-e* (also Celtic could derive from *-e) points to *-h₁e. The laryngeal, therefore, was h_1.

   Nom. neuter. Indo-Iranian points to *-ī* < *-ih₁. The Greek form will be that of the masc.-fem. If Gr. *ósse* 'eyes' reflects *okʷ-i̯e < *okʷ-ih₁, the laryngeal was *-h₁ here as well (> e). The *o*-stems point to *-oi, which came from *-o-ih₁. Greek *-ō* is the masc.-feminine form. — Note that the *ā*-stems m.-f. have the same ending (*-ih₁*) as the neuters.

   Gen. Only Avestan has a separate ending, *-ā̊* < *-ās. This was preceded by a laryngeal, considering OAv. *mainiuuā̊* = /manyuHāh/ 'spirits'. Thus *-h₁ē/ōs, or rather *-h₁e/oHs, for a long vowel is improbable.

   Loc. OCS *-u* and Lith. *-aũ* must go back to *-ou, which Av. *-uuō* < *-ō* < IIr. *-au* can also reflect. Skt. *-os* has apparently added *-s* (from the genitive?). Because Skt. *pitrós* often counts as a trisyllabic word, it was perhaps *pitrHos (although this would regularly have given *pitiros), so the ending was *-Hou+s. Other possibilities beside *-h₁ou are *-h₂/h₃e/ou (*-oHu is ruled out because the Lithuanian ending is circumflex). The *o*-stems have *-oi- preceding the ending. Gr. *-oiin* is unclear (*-oi-Hu?).

   Dat.-abl.-instr. IIr. *-bhyā* and OCS *-ma* perhaps point to *-eh₂, *-oH or *-eh₃. The Balto-Slavic instrumental plural (!) ending *-miHs perhaps points to a dual ending, *-mih₁.

Chapter 14

The Adjective

14.1 Stems

We find adjectives with suffixes ending in:

-k	-t	-nt	-s	-h₂	-r	-l	-m	-n	-i	-u	-o
(+)	(+)	+	(+)	(+)	–	–	–	(+)	+	+	+

(+ frequent, (+) rare, – none)

With *-nt* we only find *-uent- 'possessing, rich in' and the participles in *-nt-. With -s we have the perfect participle in *-ues-, the comparative in *-ies- (see Section 14.4) and compounds. A suffix *-h_2 is found in *meǵ-h_2- 'great' (see 14.3). There are no adjectives in *r*, *l*, *m*, but there are many in *-ro-, *-lo-, *-mo-; they might originally be *r*-, *l*-, *m*-stems which took *o*-inflection. Stems in an occlusive are rare except for those in *-t; it is possible to reconstruct the inflection of *melh₂-ḱ-s 'weak' (see 14.3).

There were also root adjectives (that is, adjectives which consisted of a root without suffix). The word for 'naked' has a number of different suffixes: Goth. *naq-aþs* (E. *naked*), Skt. *nag-ná*, Gr. *gumnós*, Lith. *núog-as*, Hitt. *nekumanza*, so that these suffixes must have been added in the individual languages to the root without suffix; the root is *nog^w-/*neg^w- (see 14.3).

The 'vocalic' stems (-*i*, -*u*, -*o*; this time taking *i* and *u* as vowels) are by far in the majority; and of these, the *o*-stems are again the most frequently found. Gothic, for example, still has a dozen each of the *i*- and *u*-stems, and otherwise only *o*-stems.

Some examples:

Skt. *putrá-vant-* 'rich in sons'; Gr. *kharí-ent-* 'rich in graciousness'; PIE *-uent-.
Skt *gurú-*, Gr. *barús*, Goth. *kaurus*, Lat. *gravis* (from *graus) 'heavy' < PIE *g^wr(e)h₂-u-.
Skt. *vádhri-* 'castrated', Gr. *éthri-* < PIE *ued^hri-.
Skt. *náva-*, OCS *novъ*, Hitt. *newa-*, Gr. *néos*, Lat. *novus* 'new' < PIE *neuos; *neuio- in Skt. *návya-*, Celt. *Novio-*(*magus* = 'New-field'), Goth. *niujis*, E. *new*.

14.2   Feminine and neuter

The feminine is either identical to the masculine (that is to say that there is no feminine form) or has a suffix (*-*eh₂*- or *-*ieh₂*-). The neuter has a different ablaut form of the suffix or a different ending (*-*m* or Ø), but only in the nom.-acc.; in the other cases it is identical with the masculine.

The consonant stems either have no separate form for the feminine or they have *-*eh₂*- (which is suffixed after the adjectival suffix and only occurs with some of the *u*-stems) or *-*ieh₂*- (with proterodynamic inflection).

The *o*-stems have the suffix *-*eh₂*- for the feminine, but *instead of* *-*o*-, not following it. This is understandable in view of the hypothesis that *-*o*- originally formed a part of the ending (see 13.2.10), hence *neu-os*, *neu-eh₂*-.

The neuter of the consonant stems always differs from the masculine (although that was probably not the case at an earlier phase — see Section 13.2.10 — and there are perhaps still traces of it, as in Lat. *vetus* 'old' and the *nt*-participle). The difference is, however, restricted to the nom. acc. (sg. and pl.). If the masculine nominative has an *-*s*, then the neuter has no *-*s* (but is in other respects identical). If the masculine form has full grade (*e* or *o*), then the neuter has the zero grade; if the masculine has the lengthened grade, then the neuter has zero grade or full grade. (The latter must be a more recent development, because masculine *ē*, *ō* were lengthened phonetically from *e*, *o* + R; see for example the discussion of the comparative below.) Thus:

masc.   *-s*   ntr.   *-Ø*
    -eC, -oC   *-C*
    -ēC, -ōC   *-C*; *-eC, -oC*

The neuter of the *o*-stems has *-*om*. This form is identical with the accusative of the masculine. It is perhaps a recent form, because *-*os* in origin only made masculine-feminine words; see Section 13.2.10.

masc.	ntr.	fem.	
neu-os	*neu-om*	*neu-eh₂*	'new'
medʰ-u-s	*medʰ-u*	(*medʰ-u-s*)	'sweet'; Skt. *mádhus, mádhu*
tenh₂-u-s	*tenh₂-u*	*tenh₂-u-h₂*	'thin'; Skt. *tanús, tanú, tanū́*
sueh₂d-u-s	*sueh₂d-u*	*sueh₂d-u-ih₂*	'sweet'; Skt. *svādús, svādvī́*; Gr. *hēdús, -ú, -eîa*
-uent-	*-u̯n̥t*	*-u̯n̥t-ih₂*	Skt. *ámavant-, -vat, -vatī́*
méǵ-h₂(-s)	*méǵ-h₂*		'big'; Gr. *mégas, méga*; Skt. ntr. *máhi*
-men-ēs	*-men-es*		'well-minded'; Skt. *sumánās, -as*; Gr. *eumenḗs, -és*
uet-us	*uet-us*		'old'; Lat. *vetus*
peiH-uōn	*peiH-ur*	*piH-uer-ih₂*	'fat'; Skt. m. *pívan-*, f. *pívarī-*, Gr. m. *píōn*, f. *píeira*

14.3   Inflection

We have already mentioned that the inflection in principle is the same as that of the substantive. Thus the *i*- and *u*-stems usually have the PD inflection (Skt. *urú*- 'broad', gen. *urós*). There are also, however, HD *u*-stems, such as Skt. *mádhus* 'sweet', gen. *mádhvas*. Unique is the laryngeal stem *$meǵ$-h_2- 'great':

nom sg. *$méǵ$-h_2-s	Gr. *mégas*
acc. sg. *$mǵ$-$éh_2$-m	Gr. adv. *ágān* 'too much'
gen. sg. *$mǵ$-h_2-$ós$	Skt. *mahás* (with full grade from the nom.)

The inflection of 'many' is not completely clear: Gr. *polús* < *$polh_1u$-, Goth. *filu* < *$pelh_1u$- (G. *viel*), Skt. *purú*- < *plh_1u-, which thus has three ablaut forms in the root. If the last form is an innovation, the first two may point to a static paradigm.

A *k*-stem will have been HD: acc. *mlh_2-$eḱ$-m (in Gr. *malakós*), gen. mlh_2-$ḱ$-os (Gr. *blǎks*, *blākós*), 'soft'. Note that in Greek two different words have developed from one paradigm.

The word for 'naked' must have had the static inflection as shown by the alternation *e/o*: nom. *nog^w-s, gen. *neg^w-s (Section 14.1).

If the HD inflection originally was that of the masculine-feminine words, and the PD inflection was that of the neuters, one may ask the question what the situation was with respect to the adjectives. Until now there are no indications for a difference between masc.-feminine and neuter.

An inflection which is not found in this form in the substantive is that of the *s*-stem compounds (*h_1su-men-es- 'favorably disposed' to *men-os; cf. above):

nom. sg. m.	*h_1su-men -$ēs$	ntr.	-men -es
acc. sg.	-es-m		-es

The inflection of the words in *-$uent$-, and that of the participles, are only found among the adjectives.

14.4   Comparison

Comparative and superlative were originally formed with the suffixes *-*ies*- and *-*isto*- (*-*istHo*-?). The latter contained the zero grade of *-*ies*- + *-*t(H)o*-; compare French *le meilleur*, 'best', which has a comparative with an article. These suffixes were added to the root, not to the stem of the adjective. (Actually, it is not correct to speak of comparative degrees of adjectives.) For example:

Skt. *vás-u-* 'good'   : *vás-yas-*, *vás-iṣṭha-*
Gr. *olígos* 'little'   : *oleízo(h)-* < *$h_3$leig-ios-*
Skt. *tigmá-* 'sharp'   : *téj-īyas-*, *téj-iṣṭha-*

The inflection of the comparative is that of the HD inflection (see Section 13.2.5g): *-iōs*, *-iés-m*, *-is-ós*. The feminine was identical to the masculine. The neuter form had *-ios*. Older (probably PIE) was *-is*, which is preserved in adverbs: Lat. ntr. *maius* 'greater' < *-ios*, adv. *magis*; Goth. *min* 'less' < *minn-is*, *mais* 'more' < *meh₂-is* (cf. E. *more*). Germanic has *-is-on-* in the comparative, that is to say, the suffix *-ies-* plus the individualizing suffix *-on-* ('someone who is more…'):

Goth. *alþeis* 'old':   *alþiza* < *-is-ōn*
OS *lang* 'long':   *lengiro*
E. *long*: *longer*

In Greek these forms were generalized: *hēdíōn* 'sweeter', acc. *hēdíona*, older *hēdíō* < *-ios-a*.

Systems with suppletion (that is to say, comparative and/or superlative degrees from another root) as in Lat. *bonus – melior – optimus*, are found in many languages, but none of these systems can be traced to PIE.

Alongside these, there were the suffixes *-tero-* and *-(t)mo-* (*-tmHo-*?), which were added to the stem. The suffix *-tero-* originally indicated a binary contrast to something else: Gr. *thēlúteros* meant 'feminine' as opposed to masculine, not 'more feminine'; Gr. *orésteros* '(living) in the mountains', and not (simply) on the plains; cf. *k^woteros* 'who of two'. In several languages these suffixes were used for normal comparative purposes:

Skt. *júṣṭa-tara-*, *júṣṭa-tama-* 'welcome'
Gr. *dikaió-teros*, *dikaió-tatos* 'righteous'

Gr. *-tatos* replaces *-tamo-* < *-tm(H)o-*.
Italo-Celtic has the suffix *-isamo-* < *-ismo-* in the superlative, for example Lat. *maximus* 'greatest' < *mag-isamo-*. From this also developed the common Latin suffix *-issimus*. (The details are fairly complicated.) Here, then, *-is-* is combined with *-mo-* (*-mHo-*?).

These suffixes were also often used for adverbs, for example Lat. *in-terior*, *in-timus* 'more, most inner' (cf. *intus* 'inside').

Exercise 44

The adjectives below are given in the nom.sg.masc. Put them in the required case form:

a. *h_1m-o-s* 'my': loc.sg.f.
b. *g^wrh_2-u-s* 'heavy': acc.sg.f.
c. *med^h-io-s* 'middle': loc.sg.n.
d. *d^hrug^h-uent-s* 'deceitful': nom.sg.f.

Exercise 45

Reconstruct PIE preforms of the following forms:

a. Lat. *senior* 'older' (nom.sg.m.)
b. Lith. *pìrmus* 'first' (acc.pl.m.)
c. Skt. *śúci* 'bright' (nom.sg.n.)
d. Skt. *pūrvī́* 'many' (nom.sg.f.)
e. Gr. *mézous*, Myc. *me-zo-e* 'bigger' (nom.pl.m.) (to the positive *méga*)

Exercise 46

Compare the following forms: Goth. *filu* 'much' (nom.sg.n.), Gr. *polús* 'much' (nom.sg.m.), Skt. *purú* 'much' (nom.sg.n.)

a. Reconstruct the preform of each of the three given forms.
b. Now reconstruct the PIE nom.sg.masc. which lies at the basis of the following thematic adjectives: Goth. *fulls*, OIr. *lán*, Lith. *pìlnas*, Skt. *pūrṇá-* 'full'.

Exercise 47

Translate into PIE (the stem of each noun or adjective is given):

a. 'To an older (*$sen-is$-) man (*h_2n-r-, HD)'
b. 'With winged (*$pt-n-uent$-, HD) words (*uek^w-s-, PD)'
c. '(I saw) a big (*$meǵ-h_2$-) bitch (*$ḱu-n-ih_2$-, PD)'

Chapter 15

The Pronoun

15.1 Introduction

The pronouns differ in a number of respects from nouns and adjectives. Pronouns may refer to persons or things; if they refer to something that has already been said, they are called anaphoric pronouns.

Pronouns are often short. In contrast with PIE nouns they could also have the structure *CV*. Pronouns often have unaccented variants; these are called enclitic if they are used after an accented word, and proclitic if they are found before an accented word (Gr. *enklínein* 'to lean against'). A single enclitic pronominal form is often used for more than one case (for example, Modern Greek *toús* for the genitive and the accusative, as opposed to accented *autōn, autoús*).

New pronouns often come into being by means of the addition of other pronominal elements: compare for example Fr. *ce, celui, celui-ci* 'this' and Dutch *die* 'this, that', which became *hierdie* 'here-this' in Afrikaans. Such additions do not always appear in all case forms, for example Lat. nom. sg. *hīc* 'this', but nom. pl. *hī* 'these' without *-c*.

It is further worth remarking that Indo-European pronominal stems can be suppletive: two or even three different stems can sometimes be found within one paradigm, used for different case forms.

Because of these idiosyncrasies, the history of the pronouns is often difficult to trace. We must here, more than elsewhere, limit our discussion.

It seems that the inflection of the pronouns as we find it in the individual languages is partly of recent origin, perhaps post-PIE. Insofar as there was a PIE inflection, it was often different from the substantive, for example nom. pl. *-i* (as against substantival *-es*), nom. sg. ntr. *-d* (as against -Ø or *-m*).

15.2 The non-personal pronouns

15.2.1 The demonstratives

a. Stems
It is difficult to ascertain which stems existed in PIE, in other words: which pronouns PIE actually had. The individual languages differ greatly in the way the demonstrative

system is structured. If we should 'add up' all of the different stems occurring in the major Indo-European languages, we would get an unusually great number of demonstratives in PIE. We follow a recent theory which holds that PIE only had a limited number of demonstratives, and that many pronouns of the later languages were derived from particles or adverbs. This theory allows us to reconstructed a simpler PIE system and to explain many non-corresponding forms as language-specific innovations. In this vision there were only two demonstratives in PIE:

*so, f. *seh$_2$, n. *tod 'this, that': (e.g.) Skt sá, sá̄, tád; Gr. ho, hē, tó. The inflection is given in the following section.

*h$_1$e, f. *(h$_1$)ih$_2$, n. *(h$_1$)id anaphoric pronoun 'that, the (just named)': (e.g.) Skt. ayám, f. iyám, ntr. idám; Lat. is, ea, id. This pronoun will also be discussed below.

Most case forms outside the nom.acc. seem to be recent combinations of these stems with other particles or pronouns. In addition there were (at least) three particles or adverbs from which pronouns were derived in the later languages:

*ḱi 'here' is found in OCS sь, si, se and Lith. šìs, šì. In Germanic there are traces of it: Goth. acc. hina; E. he derives from it. In Hittite kās 'this' derives from this stem. It may also be preserved in Gr. keĩnos < *ḱe-eno-.

*h$_2$en 'there' has given OCS onъ, Lith. anàs 'that'. Perhaps one finds it transformed in *eno- in Gr. keĩnos 'that' from *ḱe-eno-.

*h$_2$eu 'away, again' appears in Av. OP ava-, OCS ovъ … ovъ > 'the one … the other'. In the zero grade *h$_2$u it was combined with *so in Gr. hoũtos, Skt. a-sáu, Av. hāu. *bʰo/e 'that' is found in Hitt. -pat 'the same, even' < *-bʰod, apā- 'that (one)' < *h$_1$o-bʰo-, Av. bā́ cataphoric particle, Gr. phḗ 'like, as', OCS bo 'for', Lith. bà 'really', bè 'if', Goth. -ba- 'even'.

b.   Inflection

We shall first look at the inflection of *so, and of Hitt. kās (Table A).

Singular. Nom. masc. *so. Note that there is no *-s, as opposed to the o-stem nouns. OCS and Lithuanian generalized t-. — Nom. ntr. *tod; cf. Lat. istud. Gothic added a particle. — Gen. masc. The OCS form is unexplained; Lithuanian has the old ablative (as is the case with the substantives). The traditional reconstruction is *tosio on the basis of Sanskrit. Perhaps the original form was *sio, the genitive of *si (?), which is continued in the Skt. pronoun sya-. Goth. þis < *téso is identical with the ending of the Gmc. substantive, but this ending must originally be pronominal on account of the -e-. Because -e- in the paradigm of to- is not expected, the form was probably based on *h$_1$éso of the pronoun *h$_1$e; this implies that to- probably had no genitive of its own. Gr. toũ < *to + *so. — Gen. fem. Sanskrit points toward *te/o + *sieh$_2$s (see below), Gothic towards *te + *seh$_2$s. — Dat. masc. Skt. -ai has the ending of the o-stems (the locative Skt. tásmin has no o-stem form). The Gothic form goes

back to *$paz m\bar{e}$ < *$tosm$-$\acute{e}h_1$, an instrumental form; pe < *teh_1. The element *$-sm$-probably comes from *$s(e)m$- 'one' (cf. E. *that one*). The feminine paradigm contains the element *$-si$-, which may be identified with *si 'one' as found in Hitt. 1-*is* /sis/, acc. *sian*, gen. *siel* 'one'; as *si-h_2 it may also be preserved in Gr. *ía* 'one'. In Celtic, an anaphoric particle *sin < *sim appears in the pronouns, Gaul. *sosin* 'this' < *so + *sim, OIr. *ind* 'the' < *$sindos$ < *sim + *de. — Ins. Loc. Perhaps the oldest form was *toi, m. and f., with locative *$-i$.

Plural. Nom. masc. *toi; the feminine ending is that of the *ā*-stems. — Acc. The accusative ending is the same as that of the noun. — Gen. The genitive appears to be *$toisom$, but because Gothic has *þiz*- < *tes- next to *þai*- < *toi- in the dative, *tes-might be old. The *$-s$- also agrees with the singular and it is possible that the plural form is based on the singular. — Ins. The Rigveda has only *-bhis*.

The Hittite forms do not look very similar to the others, and we have added them to the discussion in order to illustrate the problem. Much here is unexplained. *kās* < *kos; the neuter form is unexplained (*apās* 'that' has *apāt* < *$-od$); *kūn* < *kom; *kēl* has *-ēl* as genitive ending, which is unexplained. There is little that can be said about the other forms. — Plur. *kē* < *koi (the neuter form is unclear); *kūs* has the normal accusative plural ending of Hittite; *kēnzan* < *$-ns$-om, but the *-n-* is unexplained.

The inflection of *h_1e-/*h_1i- (see paradigm B). Insofar as the developments are the same as those of paradigm A, they are not repeated.

Singular. Nom. masc. This used to be reconstructed as *is, but then Skt. *ayám*, Av. *aēm* (with a particle *$-am$) cannot be understood. Sanskrit and Avestan use the pronoun *h_1e in all forms except the nominative and the accusative. OE *(h)e* and OHG *e(r)* also point towards *$(h_1)e$. Nom. ntr. Gothic has a particle, as in the accusative. Nom. fem. Skt. *iyám* < *ih_2 + *-am*. Gothic has added *s-, giving *s-ih_2 (E. *she*), taken from (*so) *seh_2. Latin has made a normal *ā*-stem, and added *e-* to it. — Acc. Skt. *im* + *am*. Goth. *in < *im. Old Latin has *im*. — Gen. Goth. *is* < *$h_1\acute{e}so$. Skt. *asyá* as in *tásya*. Latin *eius* is unexplained. — Dat. Latin *eī* is unclear. Sabellic retains traces of *esm-: loc. Umbr. *esmik* 'on this', South Picene *esmín* 'in this'. — Ins. Unclear; *h_1ei?

Plural. *h_1e-i in Latin *ī*; Goth. *eis* < *h_1ei-es. The acc. sg. Skt. *im-ám* was reanalyzed as a stem *ima-* with an ending *-m*. The nom. acc. pl. are formed from this novel stem *ima-*.

15.2.2   The interrogative and indefinite pronouns

a.   Stems
There was one form which was either stressed (the interrogative) or unstressed (the indefinite).

A	Skt. m. n.	Skt. f.	OCS m.	OCS n.	OCS f.	Lith. m.	Lith. f.	Hitt. c.	Hitt. n.	Gr. m.	Gr. n.	Gr. f.	Goth. m.	Goth. n.	Goth. f.	PIE m.	PIE n.	PIE f.
SINGULAR																		
nom.	sá tád	sā́	tъ	to	ta	tàs	tà	kās	kī	ho	tó	hē̄	sa	þata	so	*so	*tod	*seh$_2$
acc.	tám tád	tā́m	tъ	to	tǫ	tą̃	tą̃	kūn	kī	tón	tó	tḗn	þana	þata	þo	*tóm	*tod	*teh$_2$m
gen.	tásya	tásyās	togo		toję	tõ	tõs	kēl		toũ		tẽs	þis		þizos	*(to)sio		*(t)eseh$_2$s
abl.	tásmād	tásyās						kēz								*tosmōd		
dat.	tásmai	tásyai	tomu		toji	tám	tái	kēdani		tõi		tẽi	þamma		þizai	*tosmōi		*tesieh$_2$ei
loc.	tásmin	tásyām	tomь		toji	tamè	tojè	kēdani								*tosmi		*tesieh$_2$i
ins.	téna	táyā	těmь		tojǫ	tuõ	tà	kēt(anda)						þe		*toi?		*toi?
PLURAL																		
nom.	té tā́(ni)	tā́s	ti	ta	ty	tiẽ	tõs	kē	kē	hoi	tá	hai	þai	þo	þos	*toi	*teh$_2$	*seh$_2$i??
acc.	tā́n tā́(ni)	tā́s	ty	ta	ty	tuõs	tàs	kūs	kē	toús	tá	tā́s	þans	þo	þos	*tons	*teh$_2$	*teh$_2$ns
gen.	tḗṣām	tā́sām	těxъ	=	=	tũ	tũ	kēnzan		tõn		tõn	þize	þo	þizo	*tesom?		*tesom?
abl.	tḗbhyas	tā́bhyas						kēz								*toios?		
dat.	tḗbhyas	tā́bhyas	těmъ	=	=	tíems	tóms	kēdas	kēdas				þaim	þaim	þaim	*toimus		*teh$_2$mus?
loc.	tḗṣu	tā́su	těxъ	=	=	tuosè	tosè			toĩs		taĩs				*toisu		*teh$_2$su?
ins.	tḗbhis	tā́bhis	těmi	=	=	taĩs	tomìs									*toib^{h}i		*teh$_2$b^{h}i??

B	Skt.			Lat.			Goth.			PIE		
	m.	**n.**	**f.**	**m.**	**n.**	**f.**	**m.**	**n.**	**f.**	**m.**	**n.**	**f.**
SINGULAR												
nom.	*ayám*	*idám*	*iyám*	*is*	*id*	*ea*	*is*	*ita*	*si*	**h₁e*	**id*	**ih₂*
acc.	*imám*	*idám*	*imám*	*eum, im*	*id*	*eam*	*ina*	*ita*	*ija*	**im*	**id*	**ih₂m*
gen.	*asyá*		*asyás*	*eius*		=	*is*		*izos*	**h₁éso*		**h₁eseh₂s?*
abl.	*asmā́d*		*asyás*	*eō*		*eā*				**h₁esmōd*		
dat.	*asmái*		*asyái*	*eī*		=	*imma*		*izai*	**h₁esmōi*		**h₁esieh₂ei*
loc.	*asmín*		*asyā́m*							**h₁esmi*		**h₁esieh₂i*
ins.	*enā́*		*ayā́*							**h₁ei?*		=
PLURAL												
nom.	*imé*	*imā́*	*imā́s*	*ī*	*ea*	*eae*	*eis*	*ija*	*ijos*	**h₁ei*	**ih₂*	**ih₂es*
acc.	*imán*	*imā́*	*imā́s*	*eōs*	*ea*	*eās*	*ins*	*ija*	*ijos*	**ins*	**ih₂*	**ih₂ns*
gen.	*eṣā́m*		*āsā́m*	*eōrum*		*eārum*	*ize*		*izo*	**h₁éso(m)*		=
abl.										**h₁eios*		=
dat.	*ebhyás*		*ābhyás*	*īs*		*īs*	*im*		*im*	**h₁eimus*		=
loc.	*eṣú*		*āsú*							**h₁eisu*		=
ins.	*ebhís*		*ābhís*							**h₁eibʰi*		=

*kʷe-/kʷi-; adj. *kʷo-. A number of languages have used the o-stem forms, which probably in origin formed the adjective, for the independent pronoun. In some languages the three stems can co-occur in one paradigm: Skt. kás, ká̄, kát/kím, OCS kъto, čъto, Hitt. kuis, kuit; Gr. tís, tí; Lat. quis, quid, adj. quī, quae, quod; Goth. hwas, hwo, hwa.

*kʷotero- 'who of two' is derived from this stem with the suffix -tero-: Skt. katará-, OCS kotoryjь, Lith. katràs, Gr. póteros, Lat. uter (where k- < *kʷ- has disappeared), Osc. pútúrúspid 'both', Goth. hwaþar.

The indefinite is often formed by adding a particle or by reduplication: Lat. quisquis, quisquam, Hitt. kuis kuis 'who ever'.

Many interrogative adverbs and some pronouns are built to a particle *ku 'where?', e.g. Skt. kú̄, Av. kū 'where', Skt. kútra, Av. kuθra 'where', Lith. kuř 'where', OCS kъde 'where, when', Oscan puf, Lat. ubī 'where' < *kʷu-dʰ- (*kʷ restored from *kʷo-, *kʷi-), Alb. kush 'who' < *ku-so.

b.   Inflection

*kʷo- was inflected in the same way as *so. Lat. quī < *kʷo-i, with a deictic -i (quae is also *qua + i), shows that the nominative had no -s.

The inflection of *kʷe-/*kʷi- is very exciting. There is only one form for both masculine and feminine.

	Av.		OCS		Hitt.		Gr.		Lat.	
	m./f.	n.	m./f.	n.	m./f.	n.	m./f.	n.	m./f.	n.
					SINGULAR					
nom.	-ciš	-cit̰	kъto	čъto	kuis	kuit	tís	tí	quis	quid
acc.	-cim	-cit̰	(kogo)	čъto	kuin	kuit	tína	tí	quem	quid
gen.	cahiia		kogo	česo	kuēl		téo		cuius	
abl.	kahmāt̰				kuēz				quō	
dat.	kahmāi		komu	česomu	kuēdani		téōi		cuī	
loc.	c/kahmi				kuēdani					
ins.	kā / kana								quī	
					PLURAL					
nom.	caiiō		cī-(ca)				kuies		tínes	tína	quēs	(quia)
PIE sg.	nom.	*kʷe		*kʷo							
			*kʷid		*kʷod	*kʷeh₂?					
	acc.	*kʷim		*kʷom							
	gen.	*kʷeso		*kʷoso							
	abl.	*kʷed?		*kʷosmōd							
	dat.	*kʷesmei		*kʷosmōi							
	loc.	*kʷesmi		*kʷosmi							
	ins.	*kʷei	*kʷih₁	*kʷoi							
pl.	nom.	*kʷei	*kʷih₂	*kʷoi		*kʷh₂?	*kʷeh₂es?				

Nom. Avestan has *kō* < *k^wos alongside *-ciš*, OCS *kъ-* < *k^wo-*, the other languages point towards *k^wis. The Celtic forms, OIr. *cía*, W. *pwy*, reflect *k^wei, so the nominative must have been *k^we*; the additional element *-i* is also found in Lat. *quī* < *k^wo-i*. We then get the same pattern as in the pronoun *h_1e*, *im*. — In several languages *k^wo*- took the place of masc./fem. *k^we*, *k^wim*, *k^we*-, while the old form was retained in the neuter. — Acc. Greek added to *tin* the ending *-a* (cf. *pód-a* < *-m̥*). Other forms were subsequently made from *tin-*, gen. *tin-ós*, dat. *tin-i*. Slavic uses the genitive for the accusative. — Gen. OCS and Greek point toward *k^weso*, the *-e-* of which is confirmed by the palatal initial *c-* of Av. *cahiia*, replacing putative *caha*.

15.2.3 The relatives

As a relative pronoun the IE languages use either *k^wo*-, *k^wi*- or *io-*, the *o*-stem derived from (*h_1e-/)*i-*. Which of the two was the original relative is disputed. The interrogative (*k^wo-*) can easily have come to be used secondarily as a relative. It is presently thought that both pronouns may have existed, but with different functions. Indefinite *k^wi*- made restrictive relative clauses which preceded the main clause, whereas *io-* followed the main clause and was not restrictive.

io- was inflected in same way as *so*, *to-* and *k^wo*-.

Exercise 48

a. Explain why the inflection of *k^we-/k^wi*- is "very exciting". Focus on: (1) gender, (2) ablaut, (3) case endings.

b. Explain the formation and meaning of the following Italic adverbs derived from pronouns:

   Lat. *tunc* 'then' < *tomke*
   Lat. *sīc* ' thus' < *seike*
   Lat. *topper* 'just then' < *todper*
   Lat. *citrō* 'to this side' < *kiterōd* (abl.sg.)
   Umbrian *esmik* 'on this' < *esmike*

c. Which PIE pronominal form could be reflected in Gr. Cyprian dial. *in* 'him, her', Hom. *m-in* (*m-* is secondary)?

> **Exercise 49**
>
> Demonstrative and personal pronouns are sometimes reduplicated. Which reduplicated PIE pronouns can you recognize in the following forms? Note: many forms additionally use a particle such as *-de*, *-pe* or *-ke*.
>
> a.   Oscan *idik* 'this' (nom.acc.sg.n.) < *-ke*
> b.   Latin *sapsa* 'herself' (nom.sg.) < *-pe-
> c.   MW *hihi* 'she'
> d.   OIr. *suide* 'this' < *so-de-so

15.3   The personal pronouns

15.3.1   The (non-reflexive) personal pronoun

PIE had no personal pronoun for the third person, like so many other languages. For that purpose a demonstrative was used (probably *h_1e*; see paradigm B of the non-personal pronouns).

There are still very many problems, not all of which can be discussed here.

'I'. Nom. Some languages have added *-ō (*-e/oH?), others *-(H)om (Skt. *ahám* < *h_1eǵHom). Old Avestan has *azə* < *h_1eǵ once. Hitt. *ūk* has its -u- from *ammuk*, OCS *azъ* for *jazъ* < *ēg(H)om with lengthening of *e according to Winter-Kortlandt's law. — Acc. Greek and Hittite point toward *$h_1$me, as does Arm. *im*. Goth. *mik* has -k from the nominative, as does Hittite, which moreover has the -u- of *tuk*. — Gen. Av. *mana* and OCS *mene* point toward *$h_1$mene; in both languages this form is completely inexplicable, so it must be an old inheritance. Greek has *$h_1$me-so (cf. *h_1e-so). Hittite has -ēl in the genitive, of which the origin is unclear. Germanic uses the possessive (cf. E. *mine*), while Latin uses the genitive of the possessive adj. *meus*. — Abl. The Hittite form is unclear. — Dat. The Sanskrit ending -*ya* < *-io (or *-ie) is inexplicable and therefore perhaps old. Lat. *mihī* has the normal dative ending -*ei*. Gr. *emoí* is (in origin) the enclitic form. Goth. *mis* (OHG *mir*) is unclear. — The locative and the instrumental are unclear.

'I'	Skt.	OCS	Lith.	Hitt.	Gr.	Lat.	Goth.
nom.	*ahám*	*azъ*	*àš*	*ūk*	*egṓ*	*egō*	*ik*
acc.	*mā́m, mā*	*mene, mę*	*manè*	*ammuk*	*emé, me*	*mē*	*mik*
gen.	*máma, me*	*mene*	*manę̃s*	*ammēl*	*eméo, meo*	*meī*	*meina*
abl.	*mád*			*ammēdaz*		*mē(d)*	
dat.	*máhya(m)*	*mьně, mi*	*mán*	*ammuk*	*emoí, moi*	*mihī*	*mis*
loc.	*máyi*	*mьně*	*manyjè*	*ammuk*			
ins.	*máyā*	*mъnojǫ*	*manimì*				

'you'	Skt.	OCS	Lith.	Hitt.	Gr.	Lat.	Goth.
nom.	*tvám*	*ty*	*tù*	*zīk*	*sú*	*tū*	*þu*
acc.	*tvā́m, tvā*	*tebe, tę*	*tavè*	*tuk*	*sé, se*	*tē*	*þuk*
gen.	*táva, te*	*tebe*	*tavę̃s*	*tuēl*	*séo, seo*	*tuī*	*þeina*
abl.	*tvád*			*tuēdaz*		*tē(d)*	
dat.	*túbhya(m)*	*tebě*	*táu*	*tuk*	*soí, soi*	*tibī*	*þus*
loc.	*tvé, tvávi*	*tebě*	*tavyjè*	*tuk*			
ins.	*tvā́, tvávā*	*tobojǫ*	*tavimì*				

'we'	Skt.	OCS	Lith.	Hitt.	Gr.	Lat.	Goth.
nom.	*vayám*	*my, ny*	*mḗs*	*wēs*	*hēmeĩs*	*nōs*	*weis*
acc.	*asmā́n, nas*	*nasъ, ny*	*mùs*	*anzās*	*hēméas*	*nōs*	*uns(is)*
gen.	*asmā́kam*	*nasъ*	*mū́sų*	*anzēl*	*hēméōn*	*nōstrī*	*unsara*
abl.	*asmád*			*anzēdaz*		*nōbīs*	
dat.	*asmé*	*namъ*	*mùms*	*anzās*	*hēmĩn*	*nōbīs*	*uns(is)*
loc.	*asmé*	*nasъ*	*mumysè*	*anzās*			
ins.	*asmā́bhis*	*nami*	*mumìs*				

'you'	Skt.	OCS	Lith.	Hitt.	Gr.	Lat.	Goth.
nom.	*yūyám*	*vy*	*jū̃s*	*sumēs*	*hūmeĩs*	*vōs*	*jūs*
acc.	*yuṣmā́n, vas*	*vasъ, vy*	*jùs*	*sumās*	*hūméas*	*vōs*	*izwis*
gen.	*yuṣmā́kam*	*vasъ*	*jū́sų*	*sumēl*	*hūméōn*	*vōstrī*	*izwara*
abl.	*yuṣmád*			*sumēdaz*		*vōbīs*	
dat.	*yuṣmé*	*vamъ, vy*	*jùms*	*sumās*	*hūmĩn*	*vōbīs*	*izwis*
loc.	*yuṣmé*	*vasъ*	*jumysè*	*sumās*			
ins.		*vami*	*jumìs*				

PIE	'I'	'you'	'we'	'you'
nom.	*h_1eǵ(oH, -Hom)*	*tuH*	*uei*	*iuH*
acc.	*$h_1$mé, $h_1$me*	*$tué$*	*$nsmé$, *$nōs$*	*$usmé$, *$uōs$*
gen.	*$h_1$méne, *$h_1$moi*	*$teue$, *toi*	*$ns(er)o-$, *nos*	*$ius(er)o-$, *uos*
abl.	*$h_1$med*	*$tued$*	*$nsmed$*	*$usmed$*
dat.	*$h_1$méǵʰio, *$h_1$moi*	*$tébʰio$, *toi*	*$nsmei$, *ns*	*$usmei$*
loc.	*$h_1$mói*	*$tói$*	*$nsmi$*	*$usmi$*
ins.	*$h_1$mói*	*$tói$*	?	?

'**you**' (sg.). Nom. Skt. *tvám* < *$tuHam$. Greek has the *s-* of the accusative; Doric still has *tú*. The Hittite form *zīk* points to *tiH, which may have been the original PIE

form as against *tuH* which the other languages require. In the latter form, *-u-* can be explained from the oblique stem *tu-*. — Acc. Gr. *sé* < *tué*. — Gen. OCS has the *-b-* of the dative. — Dat. *tebʰio*, cf. Av. *taibiiā*.

'**we**'. Nom. Goth. *weis* < * *uei* + *s* (OHG *wir*, E. *we*), Hitt. *wēs* < *uei* + *es*. Gr. *hēmeîs* is the acc. *hēme* + *es*. Latin has the enclitic form. OCS *my* has *m-* from the 1 pl. ending of the verb, *-y* from *vy* 'you' (pl.) — Acc. Gr. Aeol. *ámme* has the shortest, and oldest form, from *nsmé* (> *asme* > Aeol. *ámme*, Att. *hēme*). Skt. *-ān* is the ending of the *o*-stems. Latin has the enclitic form. Goth. *uns* reflects *ņs*, whence also came Hitt. *anz-*. — Gen. Sanskrit and Gothic use the possessive pronoun, and Latin has the genitive of this form. OCS *nas-ъ* is encl. *nōs* with the ending *-om*. — Abl. Lat. *nōbīs* is an innovation (*-bī-* as in *tibī*, with plural *-s*?). — Dat. Skt. *asmé* points toward *nsmeí*. Goth. *uns(is)* has *-is* from *izwis* 'you' (pl.). — Loc. Gr. Aeol. *ámmi* is probably older than (*hēm*)-*īn* (with secondary *-n*; the length of the *-i* is unexplained). The old form can have been *nsmi*. — Instr. The endings are those of the substantives, and so can be innovations.

'**you**' (pl.). The forms of 'you' (pl.) present us with the greatest number of problems. Nom. *iuH*. Skt. *yūyám* < *iuH* + *y* + *am*, with *-y-* from *vayám*. Gothic added an *-s*. For Hittite, Greek and Latin see the accusative. — Acc. Aeol. *úmme* < *usmé* is the oldest form. In Hittite *sum-* appears, for reasons which are unclear, instead of *usm-*. The Gothic form is the subject of much dispute (*izwis* for *uzwes?*). — The other forms are parallel with those for 'we'.

15.3.2 The reflexive

For the reflexive 'myself', etc., we find among others the following forms (naturally there is no nominative):

sg.	YAv.	OCS	Lith.	Gr.	Lat.	Goth.	PIE
acc.		*sę*	*savè*	*hé*	*sē*	*sik*	*se
gen.		*sebe*	*savę̃*	*héo*	*suī*	*seina*	*seue, *sei
dat.	*huuāuuōiia*	*sebě*	*sáu*	*hoî*	*sibī*	*sis*	*sebʰio, *soi
encl.	*hōi*	*si*		*hoi*			
pl.							
acc.				*sphé*(*as*)			
gen.				*sphéōn*			
dat.				*sphí*(*si*)			

The PIE forms are similar to those for 'you' (sg.).

Singular. Acc. OCS and Latin point to **sē*, Gothic to **se*, Greek (Pamphylic *whe*) to **sue*. The long vowel is due to a later lengthening. The old form is **se*; **su-* comes from the possessive. Sanskrit has *svayám* 'self'. — Gen. OCS *sebe* has the *-b-* of the dative (as with 'you' sg.), and probably stands for **seue*. The Latin and Gothic forms are possessives. — Dat. Avestan has /*hwawya*/ < **sue-bʰio*, Lat. *sibī* < **sebʰei*. For Gothic *sis* compare *mis*. — Encl. Gr. **suoi* has *su-* from the possessive. OCS points toward **sei*, as does the Gothic possessive *seina*.

Hittite has *-za* (Luw. *-ti*), of which the origin is unclear.

Plural. Only Greek has special forms for the plural. These are based on *sphe* and *sphi*, but Aeol. *spheis* and Myc. *pei* (/*spheis*/ or /*spheihi*/) point toward **sphei* < **sbʰei*. This form seems to contain the zero grade of **se* and would thus be very old. Perhaps it is the oldest dative. In Greek this could have been replaced by *sphi*, and then *-phi* (originally an instrumental) could have been understood as plural. — The element **-bʰ-* we probably find in the word for 'self' too: OPr. *sups* < **su-bʰo-*, Goth. *silba* < **selbʰo-*, (E. *self*), Ven. dat. *sselboi sselboi*.

15.3.3 The possessives

The possessives ('my', 'your', etc.) have the following shape:

PIE	Skt.	Av.	OCS	Lith.	Arm.
*h₁mos	_	*ma-*	*moi*	*màno*	*im*
*tuos	*tvá-*	*ϑβa-*	*tvoi*	*tàvo*	*kʿo*
*suos	*svá-*	*xᵛa-*	*svoi*	*sàvo*	*iwr*
*nsos	*asmā́ka-*	*ahmāka-*	*našь*	*mū́sų*	*mer*
*usos	*yuṣmā́ka-*	*yūšmāka-* (*xšmāka-*)	*vašь*	*jū́sų*	*jer*

Hitt.	HLuw.	Gr.	Lat.	Goth.
-mis	(*á*)*mis*	*emós*	*meus*	*meins*
-tis	*tuwas*	*sós, teós*	*tuus*	*þeins*
-sis		*hós, heós*	*suus*	*seins*
-summis	*azis*?	*ámmos, hēméteros*	*noster*	*unsar*
-smis	*uzis*?	*úmmos, hūméteros*	*vester*	*izwar*
-smis		*sphós, sphéteros*		

The agreement between Av. *ma-* and Gr. *emós*; Skt. *tvá-*, Av. *ϑβa-*, Arm. *kʿo*, Gr. *sós* and HLuw. *tuwa-* points toward **h₁mós*, **tuós*; so also **suós* (OLat. *sus*). OCS *moi* < **h₁mo-io-* etc. point toward the same forms.

Gr. *teós*, Lat. *tuus* probably go back to the genitive of the personal pronoun (**teue*).

Lat. *meus* < **mei-o-* is based on **h₁mei*, which we also see in Goth. *meins* < **mei-n-* (E. *mine*). Hitt. *-mis* probably goes back to this, too; the acc. *-man* still has the old *o*-stem.

For the second and third person plural there is little agreement. Gr. Aeol. *ámmos*, *ummos* < **nsmos*, **usmos* appear in structure similar to the forms for the singular. One also finds them in Skt. *asmā́ka-* < **nsmó-ko-*, etc. HLuw. *azis* appears to be still older, if it goes back to **ns-o-* (< **amz-* < **ans-* < **ns-*). We furthermore find forms with **-ro-* (Armenian; also *iwr* < **seuro-*), **-ero-* (Germ.) and **-tero-*. Hittite has *-sum-mis* in 1 pl. and *-smis* in 2+3 pl. The latter may derive from **usm-*. For Gr. see under the reflexive.

PIE **suos* does not mean 'his', but 'own', and was used for all persons, for example Hom. (Odyssea ι 27): *oú toi egṓ ge / hḗs gaíēs dúnamai glukerṓteron állo* (*w*)*idésthai* 'I can /see nothing (else) that is sweeter than (my) own country' ('There is for me nothing more sweet…') with *hḗs* < **suās* gen. sg. f. from **suo-*.

Exercise 50

In which two ways could a PIE speaker express his status as a possessor (as in 'my man, 'my horse') by means of a pronoun?

Exercise 51

Here are some Old Prussian forms of some pronouns: *kas* 'who' nom.sg.m., *ka* 'what' nom. acc.sg.n., *quai* 'who' nom.sg.f., *kasmu* dat.sg.m., *kan* acc.sg.m.; *toū* 'you' nom.sg., *ioūs* 'you' nom.pl. Explain from which PIE pronominal forms these can be derived.

Exercise 52

Compare the following reconstructions of some Old Albanian possessive pronouns: *em* 'my' nom.sg.m. < **(e)i-moi/me*, *tand* 'your' acc.sg.m. < **tom-toi/t(u)e*, *jonë* 'our' nom.sg.f. < **ejā-nos*, *yj* 'your' nom.sg.m. < **(e)i-u̯os*, *juoj* f. < **ejā-u̯os*. Some details are unclear but the building blocks of each form can be distinguished. Explain from which PIE stems these pronouns are put together.

Chapter 16

The Numerals

The numerals of PIE can be reconstructed down to the last detail. That is not self-evident, for numerals are often borrowed. In the ancient Indo-European languages, however, that seldom occurred.

The numeral system is based on the counting of decimals.

Numerals belong in a series, which results in the fact that they influence each other. For this reason the explanation of their form is extremely complicated. Here we can only discuss the general lines of development.

16.1 The cardinal numbers

16.1.1 From 'one' to 'ten'

'One'. Most languages have cognates of OLat. *oinos* (cf. Gr. *oinḗ* 'one' found on the die). This may point to **Hoi(H)nos*, but OCS *inъ* (next to *jedinъ*) is unclear, for which reason the reconstruction is uncertain; the Baltic forms also present problems. The stem **Hoi(H)no-* can be related to OP *aiva-*, Gr. *oĩ(w)os* 'one, alone'. Armenian, Tocharian and Greek provide evidence for a stem **sem-*, which probably meant 'one, together, united'. It had the HD inflection: nom. **sōm* (OCS *samъ* 'self'), acc. *sém-m*, gen. *sm-ós*, dat. *sm-éi* (compare also the oblique cases sg. of the inflection of the pronoun). A variant may have been **si* (Hitt. *si-* 'one', Skt. f. gen. *tá-sy-ās* etc.; see Section 15.2.1), on which Gr. *ía* 'one' may also be based (**si-h$_2$*). The more common feminine of **sm-* is **sm-ih$_2$* (Gr. *mía*, Arm. *mi*).

'Two'. This word was originally inflected as a dual: Skt. *dvā́* < **duo-h$_1$*, fem. ntr. *dvé* < **duo-ih$_1$*. The old genitive (Skt. *dváyos* < **duoiHous*) still survives in Germanic: Goth. *twaddje*, with *-ddj-* < *-iH-* due to 'Verschärfung', that is, the development of a glide (**jj*) to an obstruent (*ddj*). OHG *zwei* is based on the neuter. Several languages reflect a form **duu̯o-* with vocalic *u*. Arm. *-ku* < **du̯oh$_1$*, with *er-* taken from 'three'. The *-u* of Skt. *dváu* and the short *-o* of Gr. *dúo* have not been satisfactorily explained.

'Three' was inflected as a (plural) *i*-stem: **treies*, acc. *trins*, gen. *treiom*, loc. *trisu* etc.; ntr. *tri-h$_2$*. The feminine has a strongly deviant form: Skt. *tisrás*, OIr. *teoir*, both from **tisres*. The element *-s(o)r-* might also appear in Hitt. *hassussara-* 'queen' (from *hassu-* 'king').

	PIE	Sanskrit	OCS	Lith.	Armenian	Albanian
1	*Hoi(H)nos	ékas	jedinъ	víenas	mi	një
2	*duoh₁	dvā́(u)	dъva	dù	erku	dy
3	*treies	tráyas	trъje	trỹs	erekʿ	tri, tre
4	*kʷetuōr	catvā́ras	četyre	keturì	čʿorkʿ	katër
5	*penkʷe	páñca	pętь	penkì	hing	pesë
6	*(s)uéks	ṣáṣ	šestь	šešì	vecʿ	gjashtë
7	*séptm	saptá	sedmь	septynì	ewtʿn	shtatë
8	*h₃ḱteh₃	aṣṭā́(u)	osmь	aštuonì	utʿ	tetë
9	*(h₁)néun	náva	devętь	devynì	inn	nëntë
10	*déḱmt	dáśa	desętь	dēšimt	tasn	dhjetë
11		ékā-daśa	1 na desęte	vienúolika	me-tasan	një-mbë-dhjetë
12		dvā́-	2 na desęte	dvý-lika	erko-	dy-mbë-dhjetë
13		tráyo-	etc.	trý-	erekʿ-	etc.
14		cátur-		keturió-	čʿorekʿ-	
15		páñca-		penkió-	hnge-	
16		ṣó-		šešió-	veš-	
17		saptá-		septynió-	ewtʿn ew tasn	
18		aṣṭā́-		aštuonió-	utʿ ew tasn	
19		náva-		devynió-	inn ew tasn	
20	*duidḱmti	viṁśatí	dъva desęti	dvì-dešimt	kʿsan	njëzet
30	*trih₂dḱomth₂	triṁśát	trъje desęte	trìs-	ere-sun	tridhjetë
40	*kʷetur-	catvāriṁśát	četyre desęte	kēturias-	kʿařa-sun	dyzet
50	*penkʷe-	pañcaśát	pętь desętъ	peñkias-	yi-	pesëdhjetë
60	*ueks-	ṣaṣṭí	sestъ desętъ	šēšias-	vatʿ-	etc.
70	*septm-	saptatí	etc.	septýnias-	ewtʿana-	
80	*h₃eḱth₃-	aśītí		aštúonias-	utʿ-	
90	*h₁neun-	navatí		devýnias-	inn-	
100	*dḱmtóm	śatám	sъto	šiṁtas	hariwr	qind
1000	*ǵʰes-l-	sahásram	tysǫšti	tū́kstantis	hazar	mijë
1st	*prh₂uó-	prathamá	prъvyjь	pìrmas	ařaʃin	i parë
2nd	*h₂entero-?	dvitī́ya-	vъtoryjь	añtras	erk-rord	i dytë
3rd	*trió-	tr̥tī́ya-	tretijь	trẽčias	er-	i tretë
4th	*kʷturó-	turī́ya-	četvrъtyjь	ketvir̃tas	čʿor-	i katërtë
5th	*pnkʷó-	pañcamá-	pętyjь	peñktas	hing- erord	i pestë
6th	*uksó-	ṣaṣṭhá-	šestyjь	šēštas	vecʿ-	i gjashtë
7th	*s(e)ptmó-	saptátha-	sedmyjь	septiñtas	ewtʿn-	i shtatë
8th	*h₃eḱth₃uó-	aṣṭamá-	osmyjь	aštuñtas	utʿ-	i tetë
9th	*h₁nunó-	navamá-	devętyjь	deviñtas	inn-	i nëntë
10th	*d(e)ḱmtó-	daśamá-	desętyjь	dešiṁtas	tasn-	i dhjetë

Toch. A/B	Greek	Latin	OIr.	Goth.
sas/ṣe	heĩs	ūnus	oén	ains
wu/wi	dúō	duo	da	twai
tre/trai	treĩs	trēs	tri	þreis
śtwar/śtwer	téssares	quattuor	cethir	fidwor
päñ/piś	pénte	quīnque	cóic	fimf
ṣäk/ṣkas	héks	sex	sé	saihs
ṣpät/ṣukt	heptá	septem	secht	sibun
okät/okt	oktṓ	octō	ocht	ahtau
ñu	ennéa	novem	noí	niun
śäk/śak	déka	decem	deich	taihun
śäk ṣapi/[1]	héndeka	ūn-decim	1 deac	ainlif
śäk wepi/	dṓdeka	duo-	2 deac	twalif
śäk täryāpi/	3 kaí déka	trē-	etc.	
śäk śtwarpi/	4 kaí déka	quattuor-		fidwortaihun
śäk päñpi/	pentekaídeka	quīn-		fimftaihun
śäk ṣäkpi/	heksakaídeka	sē-		etc.
śäk ṣpätpi/	heptakaídeka	septen-		
śäk okätpi/	oktōkaídeka	duodēvīgintī		
śäk ñupi/	enneakaídeka	undēvīgintī		
wiki/ikäm	eíkosi	vīgintī	fiche	twai tigjus
taryāk/täryāka	triā-konta	trī-gintā	tricho	þreis tigjus
śtwarāk/śtwārka	tessará-	quadrā-	cetharcho	etc.
pñāk/p(i)śāka	pentḗ-	quinquā-	coíco	
säksäk/ṣkaska	heksē-	sexā-	sesco	
ṣäptuk/ṣuktanka	hebdomḗ-	septuā-	sechtmogo	sibuntehund
oktuk/oktaṅka	ogdoḗ-	octō-	ochtmogo	ahtautehund
nmuk/ñumka	enenē-	nōnā-	nócho	niuntehund
känt/kante	hekatón	centum	cét	taihuntehund
wälts/yaltse	khī́lioi	mīlle	míle	þūsundi
[2]/pärweṣṣe	prõtos	prīmus	cétnae	fruma
wät/wate	deúteros	secundus	tanaise	anþar
trit/trite	trítos	tertius	triss	þridja
śtärt/śtartte	tétartos	quartus	cethramad	
pänt/piṅkte	pémptos	quīntus	cóiced	fimfta
ṣkäṣt/ṣkaste	héktos	sextus	seissed	saihsta
ṣäptänt/ṣuktante	hébdomos	septimus	sechtmad	
oktänt/oktante	ógdoos	octāvus	ochtmad	ahtuda
*ñunt/ñunte	énatos	nōnus	nómad	niunda
śkänt/śkante	dékatos	decimus	dechmad	taihunda

1. Toch. B *śak ṣe* etc; 2. Toch. A *maltowinn*.

'Four' also had plural forms (*k^w*étuor-es*, *-uér-ns*, *-ur-om*, etc.), its feminine taking the same suffix as found with 'three': *k^w*etur-sr-*. There was, perhaps, also a singular form, *k^w*étuōr*, among others in Lat. *quattuor*, Goth. *fidwor*.

'Five' was *$penk^w$*e*. OCS has a form in *-tis*.

'Six'. Many forms seem to point to *$sek̑s$*, others towards *$suek̑s$* (Av. *xšuuaš*, Gr. Delph. *uek̑s*, Gaul. *suexos*). PIE possibly had *$uek̑s$* (OPr. *uschts* 'sixth') while *s-* was adopted from 'seven', perhaps already in PIE (but not in the ordinal).

'Seven'. Why Gothic lost the *-t-* is unclear. OCS *-dm-* comes from the ordinal number.

'Eight'. Sanskrit and Gothic have *-u*, as with 'two'. The form is often analyzed as an original dual, but it is unclear of what stem.

'Nine'. The double *nn* of Greek is difficult. It has been proposed that *d-* was taken over from *$dek̑mt$* 'ten', after which the preglottalized *d* yielded *ˀdn-* > *enn-*.

'Ten'. Notice the parallel structure with one full grade, of *$séptm$*, *$h_1néun$*, *$dék̑mt$*.

16.1.2   From 'eleven' to 'nineteen'

The numerals from 'eleven' to 'nineteen' are formed in a number of different ways, so that a reconstruction of the PIE terms is not possible. In the words for 'eleven' and 'twelve', Goth. *-lif* recalls Lith. *-lika*; it has been supposed that this contains PIE *$leik^w$*- 'to leave', but the comparison raises several problems.

16.1.3   The decimals

'Twenty' was *dui-$dk̑mt$*- 'two ten(s)'. The glottal stop of the second *d* is responsible for the development of the final glide or resonant of the preceding numeral toward long *ī* (as in Lat. *vīgintī* 'twenty'), Gr. *-mē-*, Lat. *-rā-* from *-mˀ*, *-rˀ-* (as in Gr. *hebdomḗkonta*, Lat. *quadrāgintā*). A trace of the glottal stop of the first *d-* can still be seen in the *e-* of Gr. *eíkosi* < *$ewīkosi$*. The *ˀ* behaves in the same way as does *h_1*. Original *$m̥$* in *-(d)k̑mt-* is still reflected as *a* in Gr. Dor. *wíkati*.

As of 'thirty' we find *-$dk̑omt$-h_2*, as in Gr. *triā́konta*. Germanic has Goth. (*sibunte*)-*hund* as of 'seventy'; for 'twenty' to 'sixty' we find *twai tigjus* 'two ten(s)', etc.

16.1.4   From 'hundred' to 'thousand'

The word for 'hundred' originally meant 'tenth', thus 'tenth ten', originally *$dk̑mt$-óm*. The *d-* disappeared, but a reflex of the glottal stop is still found in the *e* of Gr. *hekatón* (with *h-* from *hen* 'one'): cf. *$ewīkosi$* 'twenty'. Arm. *hariwr* may have been borrowed from Iranian; Alb. *qind* was borrowed from Latin.

No common PIE forms can be reconstructed for the hundreds. One can find a syntagm, as in Goth. *þrija hunda* 'three hundred'; a compound, as in Lat. *trēcentī* 'id.'; or a collective, as in OLat. *sescentum* 'a unit of six hundred'.

For 'thousand' Skt. *sahásram* could point to $*\acute{g}^hesl$- if *sa*- contains < $*s\underset{\circ}{m}$- 'one', and combined with Gr. *khílioi*, Dor. *khḗlioi* < $*\acute{g}^hesl$-. The Germanic forms, Goth. *þūsundi*, are related to the Balto-Slavic ones, OCS *tysęšti, -sǫšti*, Lith. *túkstantis*. Armenian, Albanian and Old Irish have loanwords, from Persian (Arm. *hazar*) and Latin respectively.

16.2   The ordinal numbers

'First' is not derived from 'one', but means 'front most' or something similar. Skt. *pū́rva-* and OCS *prъvъ* (cf. Toch. B *pärweṣṣe*) point to $*prH$-*uó*-, Lith. *pìrmas*, OE *forma* to $*prH$-*mó*-; Gr. *prōtos* probably also belongs here. Lat. *prīmus* and Alb. *parë* have the same $*pr$- (Arm. *aṙaǰ* means 'in front of').

For 'second' a word meaning 'other' is often used: $*h_2enteros$ (Lith., OCS, Goth.), $*h_2elteros$ (Latin), $*h_2elio$- (OIr.). Lat. *secundus* means 'following', as does Gr. *deúteros*. The Skt. and Arm. forms are derived from $*dui$-.

'Third' was $*trio$-; it was remodeled after the higher numbers ($*tri\text{-}to$-, $*tr\text{-}t\text{-}io$-).

The oldest form of 'fourth' is $*k^wtur$- (with -*io*- in Skt. *tur-íya-*; Lat. *quārtus* from $*k^waworto$- < $*k^wt\underset{\circ}{u}r\text{-}to$-); usually $*(k^w)e$- was restored: $*k^wetur$-.

'Fifth'. Most of the forms go back to $*penk^wto$-. Skt. *pakthá-*, OHG *funfto* point to a zero grade, perhaps in -*o*-, so perhaps $*pnk^w\text{-}ó$-.

'Sixth'. OPr. *uschts* points to a zero grade $*uks$-. Av. *puxδa-* 'fifth' probably has the -*u*- of 'sixth'. Gaul. *suexos* perhaps shows that there originally was no -*t*- here either, so PIE $*uksó$-.

'Seventh'. Voiced -*(b)d*- of Slavic and Greek must come from assimilation of $*pt$ to *m* in $*septmó$-. With zero grade in the root, one would expect $*sptmó$- (note that, because of the loss of the vowels in unstressed syllables, many PIE forms had complicated consonant clusters).

'Eighth'. The original form was perhaps $*h_3(e)\acute{k}th_3\text{-}uó$-. Greek has -*gd*- after 'seventh'.

'Ninth'. Gr. *énatos* points to $*h_1nu\underset{\circ}{n}\text{-}to$-, Lat. *nōnus* comes from $*noueno$-; PIE must then have had $*h_1nun\text{-}ó$-.

'Tenth' seems to have been $*de\acute{k}mt\text{-}ó$-, though the expected form (with zero grade of the root) would be $*d\acute{k}mt\text{-}ó$-. See further under 'hundred'. Suffixal -*t*- in the other ordinals ultimately comes from 'tenth'.

16.3   Collective adjectives

There were adjectives with collective meaning:

   *duoiHos 'double': Skt. *dvayá-*, OCS *dъvoji*, Lith. *dvejì*, Gr. *doioí* (Lat. *bīnī*, Goth. *tweihnai*, OIc. *tvennr*). — 'Both' is found as Skt. *ubhaú*, OCS *oba*, Lith. *abù*, Gr. *ámphō*, Lat. *ambō*, Toch. A *āmpi*, Goth. *bai* (cf. E. *both*). The initial part of the form resists reconstruction; then *-bʰ-* followed with the same inflection as 'two'. Adjective: Skt. *ubháya-*, OCS *oboji*, Lith. *abejì*.

   *treio- 'triple', Skt. *trayá-*, OCS *troji*, Lith. *trejì*, Lat. *trīnī, ternī*, OIc. *þrennr*.

   *kʷetuero- 'fourfold', Skt. *catvarám*, OCS *četvori*, Lith. *ketverì*, Lat. *quaternī*.

16.4   Adverbs

For 'once' no PIE form can be reconstructed. One finds Skt. *sa-kŕ̥t*, Gr. *há-paks*, both with *sm̥-*, Lat. *semel* < *s(e)m- (cf. *simplex* 'simple').

   *du̯is, *tris 'twice, thrice': Skt. *dvíṣ, tríṣ*, Gr. *dís, trís*, Lat. *bis, ter*, OIc. *tvis-var, þris-var*.

   *kʷetur-s 'four times': Skt. *catúḥ* < *-ur-s, Lat. *quater*.

16.5   Compounds

In compounds we find:

   *sm̥- 'one-'; see further under the adverbs.

   *du̯i- 'two-': Skt. *dvi-pā́t*, Lith. *dvi-kójis*, Gr. *dí-pous*, Lat. *bi-pēs*, OE *twi-fēte* 'two-footer'.

   *tri- 'three-': Gr. Myc. *ti-ri-po-de* /*tripodes*/ lit. 'three-footers' (kind of jars).

   *kʷtur- 'four-': Skt. *catur-akṣá-* 'four-eyed', Av. *caϑru-gaoša-* 'with four ears'. Gr. *trá-peza* 'table' < 'four-footer' < *(kʷ)t(u̯)r̥-ped-ih₂, perhaps also *trupháleia* 'with four crests' (of a helmet), Lat. *quadru-pēs* 'four-footer', Gaul. *Petru-corii*, Goth. *fidur-dogs* 'lasting four days'.

Exercise 53

a. The Middle Welsh words for 'three' are *tri* (m.), *teir* (f.), for 'four', *pedwar* (m.), *pedeir* (f.). Explain the difference between the m. and f. forms on the basis of the PIE inflection of 'three' and 'four'.

b. Assign the correct numbers (between 1 and 20) to the following Breton words: *naontek*, *pemp*, *dek*, *pevar*, *trizek*, *ugent*. Compare the OIr. and PIE forms to arrive at your solution.

c. Translate into PIE:

   'The third man (*$h_2$ner-*, HD)' (nom.sg.)

   '(We saw) the lady (*$potnih_2$-*, PD) twice'

   '(I have) two names (*$h_3néh_3$-mn-*, n.)'

   'To one of the first immortals (*n-mrtó-*)'

Chapter 17

Indeclinable Words

17.1 Adverbs

17.1.1 Introduction

PIE had no productive pattern for deriving adverbs from adjectives, as does Greek with the adverbs in *-ōs*, Latin with those in *-ō* or *-iter*, or French with adverbs in *-ment*. Instead, certain case-forms of the noun or adjective functioned as adverb, or a form with a suffix did so. Exact word correspondences between the different branches of Ind-European are only rarely found.

The prepositions and preverbs of the later languages were adverbs in PIE; PIE had no prepositions or preverbs. Among these adverbs there are many forms which do show agreement, so that it is possible to reconstruct them for PIE. However, partly because the elements in question are so small, the reconstruction is often very difficult. An important factor, too, is that there is no general line of development which can be detected, as is the case with the substantives and adjectives; here the truism that every word has its own history applies even more strongly.

17.1.2 Cases of substantives and adjectives

Nominative. Few adverbs are nominatives:

Lat. *adversus* 'against' (literally, 'directed or turned towards'); perhaps Lat. *satis* 'enough'

Neutral forms can also be accusatives:

Lat. *prīmum*, Gr. *prōton* 'first'

Accusative. The accusative is found very often.

Accusative of content:

Lat. *statim* 'at once' (literally 'state'); Gr. *hēdù* (*gelān*) '(to laugh) sweet, tasty'; Gr. *polú*, pl. *pollá*, OCS *mъnogo*, Lat. *multum*, Goth. *filu* 'much, often'

Accusatives of space or time:

Gr. *dḗn* 'long time' < **duān* < **dueh$_2$-m*; OCS *dьnь-sь* 'today'

Accusative of direction:

Lat. *domum* 'home'; Skt. *dūrám* 'in (toward) the distance'

From an apposition:

Gr. *próphasin* 'under pretext', Lat. *partim* 'partly'

The *genitive*, on the contrary, is not often found. When it does appear, it is seen in words indicating place and time:

Gr. *poũ* 'where?', *nuktós*, Goth. *nahts* 'at night'; Lat. *parvī* 'a little' (with verbs for displaying 'estimation')

The *ablative* indicates the origin of something:

Skt. *dūrắt* 'from faraway', Goth. *hwaþro* 'from whence'

Here perhaps belong the Greek adverbs in *-ō(s)*: *hoútōs* 'so'. Feminine forms are Lat. *extrā*, *suprā*.

The *dative* is seldom found.

The *locative* is often found:

Skt. *dūré* 'in the distance'; Skt. *párut*, Gr. *pérusi*, Ir. *uraid*, MHG *vert* < **pér-ut-i* 'in the previous year' (cf. Gr. *(w)étos* 'year'); Gr. *(e)keĩ* 'there', *peĩ* 'where?', *poĩ* 'where to?', *oíkoi* 'at home'; Lat. *domī* 'at home', *temere* 'blindly' < **temh₁es-i* 'in the dark' (Skt. *támas*); OCS *gorě* 'above' (*gora* 'mountain'), *dobrě* 'good'

The *instrumental*:

Skt. *dívā* 'during the day'; OCS *noštьjǫ i dьnьjǫ* 'night and day'; Gr. *pỗ* 'in one way or another', *pốpote*, Dor. *pépoka* 'ever', *kruphē̃*, *láthrā* 'surreptitiously, clandestine'; Lat. *grāt(i)īs* 'for thanks'

The word **péruti*, listed under the locative, apparently goes all the way back to PIE. That is also the case with the word for 'yesterday':

Skt. *hyás*, Alb. *dje*, Gr. *khthés*, Lat. *herī* (cf. *hesternus* 'of yesterday'), OIr. *in-dé*, W. *doe*, Goth. *gistra-*, E. *yesterday*; the PIE form may have been **dʰǵʰiés*

17.1.3   Substantives and adjectives with a suffix

We find a number of forms in *-dʰ-*:

*-dʰi: Skt. *ádhi* 'on'; Gr. *póthi* 'where?', *oíkothi* 'at home'. The suffix is perhaps also found in **medʰi-os* 'middle', Skt. *mádhya-*, Gr. *méssos*, Lat. *medius*, Goth. *midjis*

*-dʰe: Skt. *ihá* 'here' (Pāli *idha*), *kúha*, OCS *kъ-de* 'where?', *sъ-de* 'here'; Gr. *énerthe* 'under', Gr. *-then* 'from' in *póthen* 'from whence?', *ouranóthen* 'from the heavens'

Other typical adverbial suffixes are:

*-ti: Skt. *íti* 'thus'; *práti*, Gr. *próti* 'against'; Osc. *auti*, Lat. *aut* 'or'; Gr. *éti* 'still', Lat. *et* 'and'

-tos 'from': Skt. *itás* 'from here'; Gr. *entós*, Lat. *intus* '(from) inside'

-r: Skt. *tár-hi* 'then' (for *-hi* see Section 17.3); Lith. *kur̃* 'where?'; Goth. *þar* 'there', *her* 'here'

17.1.4   Syntactic groups

These usually consist of the collocation of preposition + noun. All of these formations are post-PIE.

ORuss. *o-kolo* 'around'; Gr. *en-ōpa* 'in the face'; Lat. *dēnuō* 'again' (< *dē novō(d)* 'from new')

17.1.5   The later prepositions and preverbs

Here is a list of the most important preverbs:

$deks(i)$ 'at the right side', in Skt. *dákṣina-*, Lith. *dẽšinas*, Gr. *deksiós*, *deksiterós* 'right'

$h_1eǵ^h(s)$ 'out': Gr. *ek(s)*, Lat. *ex*, Gaul. *ex-*, OIr. *ess-*

h_1en 'in': OPr. *an*, Gr. *en*, *éni*, (*ens > *eis* 'to, toward'), Lat. *in*, OIr. *i*, Goth. *in* (secondary zero grade in OCS *vъ*, OPr. *en*, Lith. *į-*). Hence *h_1enter* 'between, inside': Skt. *antár*, Lat. *inter*, OIr. *eter*

$h_1épi$, *h_1opi* 'by, at, towards': Skt. *ápi*, Arm. *ew*, Hitt. *āppa(n)*, Gr. *épi*, Myc. *opi*, Lat. *ob*

h_1eti, *h_1oti* 'over': Skt. *áti*, OCS *otъ*, Gr. *éti*

h_2ed 'to, by': Lat. *ad*, Goth. *at*

h_2en 'along in an upwards direction': Av. *ana*, Gr. *ána*, Goth. *ana*

h_2enti 'over against': Skt. *ánti*, Lith. *añt*, Arm. *ənd*, Hitt. *hanti*, Gr. *antí*, Lat. *ante*, Goth. *and-* (the locative of a word for 'front, face', Hitt. *hanza* /*hant-s*/)

$h_2épo$, *$h_2pó$* 'from, as of': Skt. *ápa*, Gr. *ápo*, Lat. *ab*, Goth. *af*, E. *of*; from *$h_2pó$* Lat. *po-* in *pōnō* 'to lay' < *$po-sinō$*, OS *fa-n*, G. *von*, Slav. *po-* (Slav. *pā-* from *$h_2pó$* before *HC-*)

h_2eu 'away from': Skt. *áva*, OCS *u-*, OIr. *ó*, *ua*

h_2mb^hi 'around': Skt. *abhí-tas*, Gr. *amphí*, Lat. *amb-* (*amb-ītus* 'going around' in E. *ambition*), Gaul. *ambi*, OIr. *imb-*, OHG *umbi*

h_3eb^hi, *$(h_3)b^hi$* 'towards': Skt. *abhí*, OCS *obъ*, Lat. *ob*; Goth. *bi*

$ḱnt-$ 'by, along': Hitt. *katta*, Gr. *káta*, OIr. *cét*, OW *cant*. Perhaps *$ḱnt-$* is derived from *$ḱo(m)$*. *$ḱmti$* in Greek *kasí-gnētos* 'brother' < 'born together with'; Gr. *$kasi$* > *kai* 'and'

$ḱo(m)$ 'together, with': Lat. *cum*, OIr. *co*, Goth. *ga-*

$meth_2(?)$ 'between, with': Gr. *méta*, Goth. *miþ*, G. *mit*

ndʰer(i) 'under': Av. *aδairi*, Goth. *undar*, E. *under* (cf. Skt. *ádhara-*, Lat. *īnferus* 'the lower one')

ni 'downward': Skt. *ní*, OCS *ni-zъ*, OHG *nidar*, E. *nether* (cf. Skt. *nitáram*). It also appears in the word for 'nest', PIE *ni-sd-o-* (to *sed-* 'to sit'): Skt. *nīḍá-*, Arm. *nist*, Lat. *nīdus*, W. *nyth*, OIr. *net*, E. *nest*, transformed in OCS *gnězdo*, Lith. *lìzdas*.

péri 'over': Skt. *pári*, Gr. *péri*

pos 'after': Skt. *paścắd,* Lith. *paskuĩ*, Lat. *post*

poti '(over) against': Av. *paiti*, Gr. *póti*. The relationship with *proti* is unclear.

preh₂i 'at the front': OCS *prědъ*, Lat. *prae* (this form seems to be an original locative; cf. *prh₂ós*)

préti, *proti* '(over) against': Skt. *práti*, OCS *protivъ*, Gr. *próti*, *prós*, Aeol. *prés*

prh₂ós 'before': Skt. *purás*, Gr. *páros*. This form looks like a genitive belonging with *preh₂i*. Skt. *purá*, Goth. *faura* (E. *for*) are based on *prh₂-*; perhaps they continue the instr. *prh₂-éh₁*

pro 'before, towards the front': Skt. *prá*, OCS *pro*, Lith. *pra-*, Gr. *pró*, Lat *prōd-*, OIr. *ro-*, Goth. *fra-* (E. *from*)

(s)nh₁i, *(s)nh₁(e)u* 'without': Skt. *sanu-tár*, Toch. *sne/snai*, Gr. *áneu*, Lat. *sine* (< *seni* < *snh₁i*), OIr. *sain*. From *sṇ-ter*: Gr. *áter*, MHG *sunder*

som 'together': Skt. *sám*, OCS *sъ*, Lith. *sam-*

trh₂ós 'through': Skt. *tirás*, OIr. *tar*. From the same root Goth. *þairh* (*ter(h₂)-kʷe*?) and OHG *durh* (*tṛ(h₂)-kʷe*?)

ud 'up, on high': Skt. *úd*, OCS *vy-*; Goth. *ūt* (G. *aus*) has a long *ū*, maybe from lengthening in a monosyllable.

upér(i) 'over': Skt. *upári*, Gr. *húper*, Lat. *s-uper* (the *s-* is unclear), OIr. *for*, Goth. *ufar*, E. *over*

upó 'under': Skt. *úpa*, Gr. *húpo*, Lat. *sub*, OIr. *fo*, Goth. *uf*, E. *a-b-ove*; Goth. *iup*, E. *up* < *up-n-*.

17.2 Negation particles

Ordinary negation of a constituent or a clause was expressed by:

ne 'not': Skt. *ná*, OCS *ne*, Hitt. *na(tta)*, Lat. *ne-que*, Goth. *ni(-h)*. *ne-i*: Av. *naē-(ciš)*, OCS *ni-(kъto)*, Lith. *neĩ*, Lat. *nī*. *nē*: Lat. *nē*, OIr. *ní*, Goth. *nē*. E. *none* < *ne *oinos*, Lat. *nōn* < *ne oinom*. Gr. *ou* 'not' reflects *ne *h₂oiu* 'not ever', from which *ne* disappeared, as *ne* in spoken French *ne pas*. — In compounds we find *ṇ-*; see Section 11.5.2.

In prohibitions, the clause was negated by means of:

meh₁: Skt. *mā́*, Arm. *mi*, Toch. B *mā*, Gr. *mḗ*, Alb. *mo-s*. Hitt. *le* must be related, though the details are unclear.

17.3   Particles

A sharp boundary between particles and adverbs cannot be drawn. Insofar as their structure is concerned, particles in PIE usually consist of a consonant + vowel (i.e. *-e*, *-o*), to which a sonant (usually *i*, *u*) can be added, after (**tou*) or in the place of the vowel (**tu*). These particles were easily transformed and distorted. There are few good correspondences. The meaning is often very difficult to ascertain. Much is therefore unclear. Here follow the clearest of them:

*de: Gr. *dé* emphatic or contrastive particle, *-de* 'towards' (postposition), *hó-de* etc. 'this here'

*ǵe: Gr. *ge*, Goth. *-k* in *mi-k* 'me', *au-k* 'because', G. *auch*

*ǵʰi: Skt. *hí*, Av. *zī* 'for, because', OCS *-zi*, Gr. *-khi.* Skt. *nahí*, Gr. *oukhí* 'certainly not'. The Latin pronoun *hic* 'this' is based on it.

*gʷʰe/o: Skt. *gha*, *ha*, OCS *-že*, *-go*; perhaps Gr. *-the*

*h₁e is identical with the pronoun **h₁e*: Skt. *a-sáu* 'that', Russ. *étot* 'this', Gr. *ekeῖ* 'there', Osc. *etanto* 'so much' (for **h₁éti* see Section 17.1.5)

*h₂en interrogative particle: Lat. *an*, Goth. *an*

*ḱe: Lith. *šè* 'hither', Lat. *-c(e)*, OLat. ntr. *hocce* 'this' < **hod-ke*

*ne 'like': Skt. *ná*, Lith. *nei*

*nu 'now': Skt. *nū*, *nū́*, OCS *nyně*, Lith. *nù*, Hitt. *nu*, Gr. *nu*, *nūn*, Lat. *nunc*, OIr. *nu*, *no*, Goth. *nu*

*-pe: Lith *kaῖ-p* 'how', Lat. *quip-pe* 'because'

*r̥: Lith. *iř* 'and, also', Gr. *ra*, *ar*, *ára* 'thus, as known'

*sme(h₂): Skt. *smá*; Gr. *mēn*, *mắn*? 'truly'

*tou, **tu* 'now, but': Skt. *tú*, OS *thu-s*, Goth. *þau(h)*, G. *doch*

*u: Skt. *u*, *ū*, Gr. *hoũtos* 'that person' < **so-u-to-*; Goth. *u* interrogative particle(?)

17.4   Conjunctions

Conjunctions display only a few correspondences. It is possible that they were renewed everywhere, but it is more probable that PIE had no dependent clauses with conjunctions. Words which indicate coordination are:

*-kʷe 'and': Skt. *ca*, Gr. *te*, Lat. *-que*, OIr. *-ch*, W. *-p*, Goth. *-h*. It can be used once or twice: once in Lat. *senātus populusque* 'the senate and the people'; twice in Skt. *devā́ś cā́surāś ca* (< *devā́s ca ásurās ca*) 'Gods and Asuras', Gr. *patḗr andrōn te theōn te* 'father of men and gods'.

*-ue 'or': Skt. Av. *vā*, Gr. *ē̃-(w)e*, Lat. *-ue*, Toch. B *wa-t.* Skt. *náktaṃ vā dívā vā* 'during the night or during the day'

Most of the conjunctions are derived from relative pronouns (**io-* or **kʷo-*), for example:

> **iod*, **kʷod* 'that': Skt. *yàd*, Gr. *hó*, *hóti* 'that', *hóte* 'when', Lith. *kàd*, Lat. *quod*, *cum* < *quom*; Goth. *þat-ei* from **tod*
> **iō* (**ioH*?), **iōd* 'how, as': Skt. *yā́d*, Gr. *hō̃(s)*, Myc. *jodososi* /jō-dōsonsi/ 'as they shall give'

The following conjunction may not be derived from a relative pronoun:

> **h₁ei* 'in that case' (loc. of **h₁e-*): Gr. *ei* 'if', Goth. *ei*

17.5   Interjections

Obviously speakers of PIE used exclamations of pain, surprise, horror and so forth. Such words, although onomatopoeic in nature, are still limited by time and place. They often do not display the normal sound developments because they are onomatopoeic, but sometimes they do anyway. Therefore some of the correspondences may be inherited from PIE, whereas others have probably arisen independently. I will only deal with emotional exclamations, not with pure onomatopoeia (such as E. *boom!* or Gr. *ololúzō* 'call'), the sounds people call to animals (E. *gee*, *whoa*) or nursery words (*mama*).

The interjections sometimes contain sounds that do not exist elsewhere in the language, for example in Lat. *eheu* the diphthong *eu*. Some of the forms below seem to contain an *a*, which is not found elsewhere in PIE.

> **ā* (**h₂eh₂*?) (surprise, pain): Skt. *ā*, Lith. *(a)à*, Gr. *ã*, Lat. *ā*, *ah*, Goth. *o*
> **ai* (**h₂ei*?) (surprise, pity): Skt. *e*, *ai*, Av. *āi*, Lith. *aĩ*, *ai*, Gr. *aí*, *aiaĩ*, Lat. *ai*. Note that Skt. *e* is the regular phonetic development, as is Goth. *o* in the preceding lemma.
> **bʰeu*, **bʰū* (pain): Gr. *pheũ*, *phũ*, Lat. *fū*, *fī*
> **h₁ē* (exclamation, vocative particle): Skt. *ā́*, Lith. *ė́*, Gr. *ē̃*, Lat. *eh* (*ē-castor* 'by Castor'); perhaps OHG *nein-ā* 'oh, no'; **h₁ō*: Lith. *o*, Gr. *ō̃*, Lat. *ō*, OIr. *á*, *a*, Goth. *o*, E. *oh*
> **eheu* (complaint): Skt. *aho*, Lat. *eheu*
> **ha* (surprise): Skt. *ha*, Gr. *hã*, Lat. *hā*, NHG *ha*
> **ha ha* (laughter): Skt. *ha ha*, Russ. *xa xa*, Gr. *hà há*, Lat. *hahae*, NHG *ha ha*. Compare the verb Skt. *kákhati*, CS *xoxotati*, Arm. *xaxankʿ* 'laughter', Gr. *kakházō* (< **kh-*), Lat. *cachinnō*, OHG. *kachazzen*.
> **uai* (**ueh₂i*?) 'woe': Latv. *wai*, Arm. *vay*, Lat. *vae*, OIr. *fáe*, W. *gwae*, Goth. *wai*, E. *woe*; Avestan has *vaiiōi* < **vayai* and *a-uuōi* < **avai*. Lat. *vae victīs* 'woe to the vanquished'. OAv. *aṯ vā vaiiōi aŋhaitī apə̄məm vacō* 'then shall "woe" be thy last word'.

Chapter 18

The Verb

18.1 General

18.1.1 Introduction

The verb is much more complicated than the noun. It is difficult to reconstruct its forms, because the verb system differs greatly among the individual languages. Much is still unclear. We shall therefore be less extensive here than we were when dealing with the noun.

The first question is which categories the PIE verb had. That is not immediately clear. In order to see how different the languages are from each other, we may compare the number of verbal categories found in Sanskrit with those of Gothic and Hittite. The categories of Sanskrit are given in parentheses; the categories in italics are also found in Gothic; Hittite is as Gothic, but with a middle instead of the passive, and without the optative:

	Skt.	Goth.	Hitt.	
voice	3	2	2	(*active*, *passive*, middle)
tense	6	2	2	(*pres*., imf., fut., *aor*., *pf*., ppf.)
mood	5	3	2	(*ind*., inj., sub., *opt*., *imp*.)

The question of what the original system was, must — as always — be solved by looking at the traces of archaic forms. For instance, Latin has a subjunctive and no optative, but the subjunctive of 'to be', viz. *sim*, *sīs*, *sit*, etc., would seem to be an old optative, judging by its form: *-ī- < -ih₁-* is the hallmark of the optative. In this way the following categories were long ago inferred for PIE:

voice: active, middle
tense: present (with imperfect); aorist; perfect (perhaps with pluperfect)
mood: indicative, injunctive, subjunctive, optative, imperative

This system is close, then, to that of Sanskrit (and Greek). But the PIE age of this system has been cast into doubt since Hittite became known. This oldest known Indo-European language had a much simpler verb system (see above), and it reveals no trace of the extra categories found in Sanskrit and Greek. This simplicity may well be the result of a process of simplification, but what was the original situation? If we

adopt the Indo-Hittite hypothesis, the PIE origins of the Anatolian system were not necessarily the same as those of the other IE languages (see Section 2.4).

PIE had no passive. It is absolutely clear that the passive only came into being when the individual languages developed as such. The middle indicates that the subject is closely involved in the action: Skt. *yájate*, Gr. *thúetai* 'he sacrifices for himself'.

PIE also had no future tense. The future forms in the individual languages differ greatly from each other. That may seem strange, but it is quite possible to do without a future ('I go tomorrow to …'). Gothic, for example, had no future tense.

There were primary and secondary endings (for example prim. *-ti*, sec. *-t*). The primary endings were used in the indicative of the present tense, the secondary ones were used in the indicative of the past tense, in the optative and in the imperative, insofar as the latter had no specific endings of its own.

The indicative of the past tense could be further indicated by the augment (Section 18.1.2). The same forms without the augment were called the injunctive (Section 18.8.2).

Verbs had either a thematic or an athematic inflection. In the first case, one finds a suffix *-e-* or *-o-* before the ending, for example thematic Gr. *phér-o-men* 'we carry' as opposed to athematic *pha-mén* 'we say'.

After dealing with the individual categories, we shall present an overview of the system as a whole (Section 18.10). It will then appear that the PIE system was not merely the sum total of the individual categories as found in Greek and Sanskrit, but was instead based on a completely different system.

18.1.2   The augment

In PIE, the indicative of the past tense could be indicated by the so-called augment ('increase'), $*h_1e$-, that was added before the root (and also before a possible reduplication syllable): Skt. *á-bharam*, Gr. *é-pheron*, Arm. *e-ber*.

The augment attracted the accent: Skt. inj. *bhinát* 'he split': imf. *ábhinat*. Except for the languages mentioned (and Iranian), the augment is also preserved in Phrygian (*edaes* 'he put'). In Armenian the augment is only retained in forms which otherwise would be monosyllabic: 1 sg. *lkʻi*, 2 sg. *lkʻer*, 3 sg. *elikʻ* 'I left', etc.

Probably the augment was in origin an independent particle that meant something like 'then, at that time'.

In PIE, the augment was not contracted with a following vowel, because each root began with a consonant. Of course, in the individual languages such sequences do get contracted: Skt. *ā́jat*, Gr. *ēge* 'he led' < $*h_1e$-$h_2eǵet$; OAv. *as* 'he was' (for $*ās$) was still disyllabic, /aʔas/ < $*h_1e$-h_1est.

Another source for a long vowel in the daughter languages was the combination of the augment with a following laryngeal which itself was followed by a consonant:

Gr. *éluthe* 'he came' < *h_1e-h_1lud^h-et*, compare without augment OIr. *luid* 'he went' < *h_1lud^h-et*.

To sum up, the augment was used in the indicative of the imperfect and the aorist. See the section on the injunctive (18.8.2) for forms without the augment.

18.1.3 Reduplication

Insofar as the form is concerned, two kinds of reduplication can be distinguished. The first kind repeats only the first consonant (sometimes the first two), while the other kind repeats the root, although not always completely. The former is sometimes found in the present and the aorist and often in the perfect, the latter with intensives and iteratives (verbs which express a repeated action).

The 'normal' reduplication repeats the first consonant, after which an *e* or an *i* is added. If the word began with *sC-* or *HC-* both of these consonants were repeated. Compare:

> *$dé$-$dork̂$-e* 'he has seen': Skt. *dadárśa*, Gr. *dédorke*
> *ste-$stoud$-e* 'he has bumped': Goth. *staí-staut* (-*aí*- [ɛ], generalized from *e before *h, hw* and *r*, where *e became -*aí*-)
> *sti-$st(e)h_2$-* 'stand': Skt. *tíṣṭhati*, Gr. *hístēmi* (< *si-st-), Lat. *si-st-ō*, pf. *ste-t-ī*
> *h_1le-h_1loudh-e* 'he has come': Gr. *elélouthe* (in Greek this was called the Attic reduplication; incorrectly, because it is found in all of the dialects)
> *h_2e-$h_2nok̂$-e* 'he has reached': Skt. *ā́nāśa*, OIr. *t-ánaicc* (*t*- < *to*-) has replaced *h_2ne-$h_2nok̂$-e*
> *h_3i-h_3er-ti* 'he sets into motion': Skt. *íyarti*

In some languages the vowel is made identical with that of the root: Lat. *cucurrī* 'I ran', *momordī* 'I bit', Skt. *yuyója*, pl. *yuyujmá* from *(H)i(e)ug*- 'to yoke', OIr. *-cúala* 'to hear' < *$k̂u$-$k̂lou$-. This system was not inherited from PIE.

It is disputed when *e and when *i were used in the reduplication syllable. Skt. *dádāmi*, Gr. *dídōmi* 'to give' perhaps suggest that both forms appeared in the same paradigm. It has been proposed that *i was the unaccented variant of *e before double consonant (of which the first was an occlusive), for example:

> *$d^hé$-d^hh_1-nti*   Skt. *dádhati* 'they set'
> *d^hi-d^hh_1-mé*   Gr. *títhemen* 'we set'

Intensive verbs, which express a repeated action, reduplicated (almost) the entire root. The main exception was a root-final occlusive, which was not repeated. The principle was: *CeR-CeR(T)*-. For example:

ver-v(e)rt — 'to turn':   Skt. *várvarti*
dei-diḱ- 'to indicate':   Skt. *de-diś-yá-te*, Gr. *dei-diskómenos* (< *-dik-sk-*) 'to greet'

Sanskrit has forms in which an *-i-* seems to be added after the reduplication, such as *gan-i-gm-at* 'coming'. This *i* is the reflex of a laryngeal at the beginning of the root, so PIE *HCeR-HCeR(T)-* > Skt. *CaRiCaR(T)-*.

18.2   The present

18.2.1   Stem formation

A present-tense stem can be formed in several ways, which is not the case with the aorist and the perfect tenses. We present a short overview of the possibilities; for PIE the 3 sg. in (athematic) *-ti* or (thematic) *-e* is given.

   Often more than one present tense is derived from a root (along with a single aorist). Compare:

   Gr. *mén-ō*, *mí-mn-ō* 'to remain'; Gr. *ékh-ō*, *ískh-ō* 'to hold' < *ségʰ-*, *si-sǵʰ-*
   PIE *gʷm-ié*, *gʷm-ské* 'to go': Gr. *baínō*, Lat. *veniō*; Skt. *gácchati*, Gr. *báskō*
   PIE *ǵnh₃-ské*, *ǵn-n-eh₃-* 'to get to know': Lat. *nōscō*, Skt. *jānā́ti* (analogical for *jan-*)

a.   Root Presents
The stem of root presents consists of a single root without suffixes. We distinguish the athematic type from the thematic type.

ATHEMATIC:
PIE *h₁és-ti* 'to be': Skt. *ásti*, OCS *jestъ*, OLith. *esti*, Hitt. *eszi*, Gr. *estí*, Lat. *est*, Goth. *ist*
PIE *ueḱ-ti* 'to wish': 1sg. Skt. *váś-mi*, Av. *vasə-mī*, Hitt. *uek-mi* (cf. Gr. *hekṓn* 'voluntary')
PIE *uemh₁-ti* 'to vomit': Skt. *vámi-ti*, Gr. *eméō*, Lat. *vomō*

In the last case the verb in Greek and Latin has become thematic. In most Indo-European languages, the athematic verbs have been largely replaced by those of the thematic type.

THEMATIC:
PIE *snéigʷʰ-e* 'it snows': Av. *snaēžaiti*, Lith. *sniẽga*, Gr. *neíphei*, Lat. *nīvit*, OHG *snīuuit*
PIE *uéǵʰ-e* 'to transport (by wagon)': Skt. *váhati*, OCS *vezǫ*, Gr. Pamph. *wekhō*, Lat. *vehō*, Goth. *ga-wigan* (G. *be-wegen*)

There are also present-tense forms with zero grade in the root:

PIE *tud-é* 'to bump': Skt. *tudáti*; to Goth. *stautan* (< *stoud-*), Lat. *tundō* (< *tu-n-d-*)

Often forms with full grade are found along with the above. The forms with zero grade seem to have an aorist meaning.

Root presents with an *o*-grade are frequent in Hittite but are found more rarely elsewhere. They often refer to continuous or repeated actions. They probably provided the basis for the PIE perfect (**uoid-* 'to know') and for the causatives with *o*-grade in the root (see c. below).

PIE **molh₂-* 'to mill': Hitt. *malla-, mall-* 'to mill, grind' (< **molh₂-, *mlh₂-*), Lith. *malù*, Goth. *malan*

PIE **spond-* 'to libate': Hitt. *ispānt-, ispant-* 'to libate' (< **spond-, *spnd-*), Lat. *spondeō* 'to pledge'; Gr. *spéndō < *spend-*.

b.   Reduplicated Presents
There was a small group of reduplicated root presents. They were athematic:

PIE **dé-deh₃-ti* 'to give': Skt. *dádāti*, Gr. *dídōmi*, Umbr. *dirsa < *di-d-āt*; OCS *damь*, Lith. *dúodu < *do-dh₃-* with *-o-* in the place of *-e-*, as well as lengthening and an acute accent according to Winter-Kortlandt's law
PIE **ǵʰe-ǵʰeu-ti* 'to pour': Skt *juhómi*
PIE **si-sh₁-* 'to sow': Lat. *serō* (pf. *sē-vī < *seh₁-*) became thematic

c.   Suffix *-ei/i-*
There are several formations based on this suffix. The basic type had zero grade of the root and an ablauting athematic suffix **-éi-, *-i-*.

PIE **tḱ-éi-, *tḱ-i-* 'to build': Skt. 3sg. *kṣéti*, 3pl. *kṣiyánti* 'to dwell', Gr. Myc. *ki-ti-me-no* /ktimenos/ 'cultivated'
PIE **mn-éi-, *mn-i-* 'to think': Skt. *manyate*, OCS *mьnjǫ, mьnitъ* (inf. *mьněti*), Lith. *mìni* (inf. *minéti*), Gr. *maínomai* 'to rage' ('to be spiritually moved'), OIr. *do-moin-iur*

Slavic *i* (which could have come from **iH* or **ei*) corresponds with Baltic *i* (that only can be **i*), which points toward **ei/*i*. The circumflex accent confirms this. All languages have thematized this type, except for Balto-Slavic and Italo-Celtic (Lat. *capere* < **kap-i-* but *venīre* < **gʷem-je- <* PIE **gʷm-ie-*). Usually it is the zero grade **-i-* which has served as the basis:

PIE **spéḱ-ie* 'to see': Skt. *páśyati*, Av. *spasiiā*; Gr. *sképtomai < *skepi̯e/o-* (with metathesis); Lat. *specere < *spéḱ-i-*

Until now we have seen primary derivatives, in which the verb is not derived from an existing verb or noun, but from a root. In the following examples we will be dealing with secondary derivatives, that is, derivatives from an existing verb or noun:

-ei-e- is used to form causatives with *-o-* in the root:

PIE *mon-éie* 'to warn' ('to cause to consider'): Lat. *moneō* (Skt. *mānáyati* has a different meaning)

PIE *uort-éie* 'to cause to turn': Skt. *vartáyati*, OCS *vratitъ*, Goth. *(fra)-wardeiþ* 'to cause to turn around'

-ei-e- is also used to form non-causatives with zero grade in the root:

PIE *luk-éie* 'to shine': Skt. *rucáyati*
PIE *ǵʰuH-éie* 'to call': Skt. *hváyati*, Av. *zbaiia-* /*zuʔaya-*/

-ei-e- also forms denominatives, that is to say, verbs derived from a noun:

PIE *uosn-éie* 'to buy, to sell': Skt. *vasnayáti*, Gr. *ōnéomai*, from Skt. *vasná-*, Gr. *ōnos* 'price'

Formerly, it was thought that the element *uosne-* continues the nominal stem, but *o*-stems have no stem form in *-e*. It also appears that formerly Sanskrit had *-āyá-* (*aśvāyá-* 'to desire horses'). This can be based on *-o-ie-*. The Sanskrit accent also seems to point in this direction.

-ie- can be used in order to form intensives from verbs:

PIE *dei-diḱ-i̯e* 'to display': Skt. *dediśyáte* (next to *dédiṣ-ṭe*)

-ie was added after the suffix *-eh₁-* (see point d below):

Lat. *taceō* 'to keep still' < *-ē-iō* < *-eh₁-ie/o-*

Finally, *-ie* is used in the formation of many denominative verbs:

PIE *h₃n(e)h₃-mn-ie* 'to name': Hitt. *lamniya-*, Gr. *onomaínō* < *-mn̥-iō*, Goth. *namnjan*
Skt. *námas-*   → *namasyáti* 'to honor'
Lat. *cūra*   → *cūrō* < *-ājō* 'to care'
Russ. *rabota*   → *rabotaju* 'to work'

This formation is very productive, for which reason it is very difficult to determine which verbs are old.

d.   Suffix *-eh₁-*
This suffix served to express a state or a position, compare Lat. *iaciō, -ere* 'to throw' next to *iaceō, -ēre* 'to lie'; Lith. *guĩlti* 'to go lie down' next to *guléti* 'to lie'.
    Balto-Slavic formed an intransitive aorist in this way: OCS *smrъd-ě-ti*, Lith. *smird-é-ti* 'to stink'. In Greek, the suffix also formed intransitive aorists: *man-ē-nai* 'to

rage', *khar-ē-nai* 'to be glad'. In Germanic it forms the third weak class of verbs: OHG *dagēn* (from **-eh₁-ie-*).

e.   Suffix *-sk-*

This suffix is found in all languages, and is sometimes very productive. It always had thematic inflection and the zero grade of the root:

> PIE **gʷm-skḗ* 'to go': Skt. *gácchati* (with shifted accent), Av. *jasaiti*, Gr. *báskō*
> PIE **pr̥ḱ-skḗ* 'to ask': Skt. *pr̥ccháti*, Av. *pərəsaiti*, Arm. *harcʻi*, Lat. *poscō* < **pork-skō* < **pr̥ḱ-*, OIr. *arco*, OHG *forscōn*, G. *forschen*

The oldest meaning is difficult to ascertain. In Latin it especially makes inchoatives, that is, verbs which indicate the beginning of an action (*rubē-scō* 'to become red'), in Tocharian causatives, while in Hittite it is used for imperfectives: *daskezzi* 'to start taking; to repeatedly take; to take one by one'.

f.   Suffix *-s-*

A present-tense suffix **-(e)s-* is found petrified, for example in:

> PIE **ḱleu-s*: Skt. *śró-ṣ-ati* 'to be obedient'
> PIE **h₂ǵ-es-*: Lat. *gerō* 'to carry', cf. *agō* < **h₂eǵ-*
> PIE **h₂ueg-s-* 'to grow': Gr. *aéksō*, cf. Lat. *augeō* < **h₂eug-*

Probably the suffix was originally athematic, with an ablaut **-es-/*-s-* and zero grade of the root: 3sg. **CC-és-ti*, 3pl. **CC-s-énti*. The suffix is used to build futures or subjunctives in a number of languages, for example in Gr. *leíp-s-ō* 'I shall leave', Lith. *bùs* 'will be', Lat. *ēmerō* 'I will have bought' (**ēm-es-*), Umbr. *ferest* 'will bring', OIr. subj. *-bé* (< **-bwest*) 'be'. The Sanskrit future suffix *-sya-*, as in *vak-ṣ-yáti* 'he shall speak', is a *-ie/o-* derivative of an *s*-present.

Together with reduplication (indicating repetition) the suffix **-s-* also makes desideratives:

> PIE **di-dr̥ḱ-(é)s-*, **dé-dr̥ḱ-s-*: Skt. *dídr̥kṣati* 'to desire to see'

On the model of the roots which ended in a laryngeal, of the type *CeRH-*, all Sanskrit roots in a sonant introduced **-Hs-*: *cí-kīr-ṣ-ati* < **kʷrHs-* to the Skt. root *kr̥* 'to make' < PIE **kʷr-*; the PIE root did not have a variant in **-Hs-*.

g.   Other Suffixes

There are traces of other suffixes. Thus, we find **-dʰ-* in Gr. *plḗthō* 'to fill' (cf. *é-plē-to* 'it was filled'). Gr. *é-skh-eth-on* 'I had, held back' (cf. *é-skh-on* 'I held') seems to point to a variant **-edʰ-*.

A *k*-suffix of uncertain origin is found in Lat. *fa-c-iō* 'to do' (*fa-* < **dʰh₁-*, the root of Gr. *tí-thē-mi*), Phryg. *ad-daket* 'he (shall?) do' (*da-* < **dʰeh₁-*); Gr. *olékō* ('to destroy'), cf. aor. *óle-s-a*.

h.   Nasal Presents

These are presents with an *-*n*- in the root. The *-*n*- is always found before the last consonant of the root, for example *leikʷ-, pres. *li-n-kʷ; there is an ablaut form with *e before the last consonant: *li-n-ekʷ-. Verb forms of which the final consonant was an occlusive or *s* have usually been thematized. They only remained athematic in Indo-Iranian and Hittite. In Hittite the infix was transformed to *-nin-*: *har-nin-k-anzi* 'they destroy'.

> PIE *li-n-ékʷ-ti 'to let': Skt. *riṇákti*, OPr. *po-līnka*, Lat. *linquō*
> PIE *ku-n-és-ti 'to kiss': Gr. *kunéō*, cf. OHG *kussen*, Hitt. 3 pl. *kuwassanzi*
> PIE *dm-n-éh₂-ti 'to subdue': Gr. *dámnēsi*, OIr. *damnaid*
> PIE *h₃r-n-éu-ti 'to set into motion': Skt. *r̥ṇóti*, Hitt. *arnuzi*, Gr. *órnūmi*

From verbs ending in *-*u* a novel suffix *-*neu*- was abstracted (Gr. *deík-nū-mi*, cf. Lat. *dīcō* < *deiḱ-). In the same way the suffix *-*neh₂*- > -*nā*- arose from roots ending in *-*h₂*. If the suffix *-*nh₂*- was thematized, the laryngeal disappeared (Gr. *kámnō* 'to become tired' < *ḱm-n-h₂-) or a sequence -*an*- developed (Gr. *khand-án-ō* 'to pick up' from **ǵʰnd-n̥-h₂*-). A complete paradigm of the nasal present in Sanskrit and PIE is given at the end of the chapter, in 18.11.

18.2.2 Personal endings

The present and the aorist have the same endings; we shall therefore treat together.

We already saw (Section 18.1.1) that there was a distinction between primary and secondary endings. The former were used in the indicative present, and the latter in the indicative of the imperfect and the aorist, and in the optative. The imperative had special endings, or the secondary endings. For the subjunctive see Section 18.8.3.

It has also been pointed out that there was an athematic and a thematic inflection. The primary endings of these two systems were totally different, while the secondary endings were identical.

a. The Athematic Endings (of the Present and Aorist)

PIE	Skt.	OCS	Lith.	Hitt.	Gr.	Lat.	Goth.
			PRIMARY				
*-mi	-mi	-mъ	-mi	-mi	-mi	-m	-m
*-si	-si	-si	-si	-si	-si	-s	-s
*-ti	-ti	-tъ	-ti	-zi	-ti	-t	-t
*-mes	-mas(i)	-mъ	-me	-ueni	-men/s	-mus	-m
*-th₁e	-tha	-te	-te	-tteni	-te	-tis	-þ
*-enti	-anti	-ętъ	-	-anzi	-nti	-nt	-nd
			SECONDARY				
*-m	-m	-ъ	-	-nun	-n	-m	(-u)
*-s	-s	-	-	-s	-s	-s	-s
*-t	-t	-	-	-t	-	-d	-
*-me	-ma	-mъ	-	-uen	-men/s	-mus	-ma
*-te	-ta	-te	-	-tten	-te	-tis	-þ
*-ent	-an	-ę	-	-er	-n	-nt	-na

Singular. It is easy to see that the PIE forms were: primary 1 *-mi, 2 *-si, 3 *-ti, second-ary 1 *-m, 2 *-s, 3 *-t. Hitt. -zi < -ti. Slav. -si is a contamination of *-si > -sь with the thematic ending. The absence of -i in Latin is probably analogical (3 sg. OLat. -d was later replaced by -t.)

Plural. The 3 pl. had *-(e)nti, *-(e)nt. — The 1 pl. is problematic. Skt. -mas: -ma must be old and points toward *-mes : *-me. We also find -n (Hitt., Gr.; originally perhaps -m) and *-o- (Lat. *-mos); OCS -mъ < *-mom; Greek had -men in the eastern dialects, -mes in the western dialects. The forms in the Slavic languages have led to the assumption that the thematic endings were *-(o)mom, sec. *-(o)mo (*-ome?). All the forms can be explained on the basis of this system. (Hitt. u- is perhaps derived from the dual.) — 2 pl. Skt. -tha must have had *-tH-; as there is no indication for another vowel than *e, the ending must have been *-th₁e; sec. *-te.

Dual. All dual endings are dealt with together in Section 18.6

b.   The Thematic Endings

PIE	Av. (Skt.)	OCS	Lith.	Gr.	Lat.	OIr.	Goth.
				PRIMARY			
	spasii-	*vez-*	*vež-*	*phér-*	*veh-*		*bair-*
*-oH	-ā(mi)	-ǫ	-ù	-ō	-ō	biru	-a
*-eh₁i	(-asi)	-eši	-ì	-eis	-is	biri	-is
*-e	(-ati)	-etъ	-a	-ei	-it	berid	-iþ
*-omom	(-āmas)	-emъ	-ame	-omen/s	-imus	bermai	-am
*-eth₁e	(-atha)	-ete	-ate	-ete	-itis	beirthe	-iþ
*-o	(-anti)	-ǫtъ	-a	-ousi	-unt	berait	-and
				SECONDARY			
*-om	(-am)	-ъ		-on			-(a)u
*-es	(-as)	-e		-es			-(ai)s
*-et	(-at)	-e		-e			-(ai)
*-omo/e	(-āma)	-omъ		-omen/s			-(ai)ma
*-ete	(-ata)	-ete		-ete			-(ai)þ
*-ont	(-an)	-ǫ		-on			-(ai)na

Primary. Lithuanian and Greek display the clearest indications for this inflection. 1 sg. All languages point toward *ō (except for OCS), while Lithuanian requires *-oH (which gave acute *-ū, which was shortened to -ù according to Leskien's law, see 11.9.4). — 2 sg. Compared with Lithuanian (-ì < *-íe), Greek has added -s (from the athematic inflection), whereas the acute of Lithuanian points toward a laryngeal, that is to say, *-eh₁i. We already saw that Slav. -ši contained this ending. — 3 sg. In Balto-Slavic, Old Russian -e has *-e, to which OCS has added the particle -tъ. Greek has added *-i as a characteristic of the primary ending; Greek and Slavic thus point to original -e; in Baltic, this became -a after i̯-. — 1 pl. For the ending *-mom, see the athematic inflection. The preceding vowel was *-o-, which Slavic replaced with *-e-. Indo-Iranian -ā- confirms the *-o- (according to Brugmann's law). — 2 pl. has *-e-, probably with *-th₁e. — 3 pl. The classical reconstruction is *-onti (Gr. -ousi /-ōsi/ < *-onsi < *-onti). But the ending *-nti belongs to the athematic inflection, and since *-mi, *-si and *-ti are not thematic endings, it is doubtful that *-nti would belong here. Lith. points toward *-o. This ending must be an old one, because *-onti is not likely to have disappeared. Tocharian A has -eñc < *-onti, but older forms have -e < *-o; Tocharian B has -eṃ from *-o + particle (thus not from *-onti). Slavic, Latin and Old Irish could also point to *-o, but examining this more closely would be going too far here. It is easily understandable that some languages added *-nti at a later stage.

Secondary. As has been said, the secondary endings are identical with the athematic ones, the thematic vowel excepted. The Gothic endings are those of the optative (suffix *-ai-*). 1, 3 pl *-ma, -na* (and 1 du. *-wa*) point to *-*ē*, which is not well explained.

In Hittite the presents which correspond to thematic verbs elsewhere have athematic endings, either of the *mi*-class or of the *hi*-class (see 18.4.2).

18.2.3 Inflection

The athematic inflection displays ablaut, whereby the singular has full grade with stress on the root, and the plural has zero grade of the root with the stress on the ending:

PIE	Skt.	Hitt.	Gr.
*h₁éi -mi 'I go'	*é -mi*	*epmi*	*eĩmi*
-si	*-ṣi*	*epsi*	*eĩ*
-ti	*-ti*	*epzi*	*eĩsi*
*h₁i -més	*i -más(i)*	*appueni*	*ímen*
-th₁é	*-thá*	*apteni*	*íte*
-énti	*y -ánti*	*appanzi*	*íāsi*

Next to *epp-* 'to take' < **h₁ep-*, Hittite has the zero grade *app-* < **h₁p-* in the plural forms. Gr. 3 pl. *-āsi* is an innovation; Mycenaean still has *-esi* /-*ensi*/ < **-enti*. Note that Greek verb forms always retract the stress as far as possible [cf. 11.9.3]. With a few exceptions, Greek verbal stress does not continue the PIE accent.

We cannot discuss the peculiarities of all verb types here. For the nasal presents see the paradigm at the end of this chapter. The following is the original inflection of reduplicated verbs:

PIE 123 sg.	**bʰé-bʰer-mi, -si, -ti*	Skt.	*bí-bhar-mi, -ṣi, -ti*
12 pl.	**bʰi-bʰr-més, -th₁é*		*bi-bhṛ-más, -thá*
3 pl.	*bʰé-bʰr-nti		*bí-bhr-ati*

A tentative explanation for the *i*-vocalism of the reduplication syllable has been given in Section 18.1.3. Note that the 3 pl. deviates from the normal type, as we find that the ending **-enti* was reduced to **-nti*. This points to a static inflection, on which see Section 18.7. Static inflection is also found in the 3pl. of the optative (18.8.4).

The thematic inflection had no ablaut. Examples are given in Section 18.2.2.

Exercise 54

State for the following verb forms the kind of stem formation (which suffix it contains, whether it is thematic or athematic), the presence of the augment, the person, number (1–3 sg./pl.) and whether the endings are of the primary or secondary type:

a.   *$spek̑iomom$
b.   *$bʰéh_2ti$
c.   *$h_1ésish_1ent$
d.   *$monéieh_1i$
e.   *$kh_2p\text{-}s\text{-}th_1é$
f.   *$h_1élink^wm$
g.   *$umh_1énti$
h.   *$g̑nh_3sk̑éte$
i.   *$didh_3més$
j.   *$uérug̑\text{-}iont$

Exercise 55

Reconstruct the required verb forms to the following roots, here in given in the zero grade:

a.   *$ug̑ʰ\text{-}$ 'convey'   causative pres.   3sg. impf.
b.   *$klh_2\text{-}$ 'break'   nasal pres.   3pl. pres.
c.   *$lik^w\text{-}$ 'to stay behind'   s-pres.   2sg. pres.
d.   *$g^wm\text{-}$ 'to come'   ie-pres.   2pl. inj.

18.3   The aorist

18.3.1   Stem formation

There were three kinds of aorist: the root aorist, the thematic aorist and the *s*- (or sigmatic) aorist. On the aorist with suffix *-eh_1- see 18.2.1, d.

a.   The root aorist
This consisted of a root, without suffix, plus endings. In Indo-Iranian this aorist is still frequently found, in Greek and Armenian a small number of such aorists remain, but elsewhere they have disappeared.

*$h_1é\text{-}dʰeh_1\text{-}t$ 'to put': Skt. *á-dhā-t*, Arm. *ed*, Gr. 1 pl. *é-the-men*
*$h_1é\text{-}k̑leu\text{-}t$ 'to hear': Skt. *áśrot*, Gr. imp. *klū-thi* (long *u* is analogical)
*$h_1é\text{-}pleh_1\text{-}t$, *$plh_1\text{-}$ 'to fill': Skt. *áprāt*, imp. *pūr-dhi*, Gr. *plē-to*
*$h_1é\text{-}dr̥k̑\text{-}$ 'to see': Skt. *ádr̥śma*

b.   The Thematic Aorist

This was formed by the root in zero grade with thematic inflection. There are only a few examples which may go back to PIE. Still, the formation is an old one.

> *h_1é-uid-et* 'to see': Skt. *ávidat*, Gr. *eīde*
> *h_1é-$h_1$lud^h-et* 'to come': Gr. *éluthe*, OIr. *luid*

A number of attested thematic aorists represent later thematizations of athematic aorists, for example Gr. *édrakon* 'I saw', *ékluon* 'I heard' (cf. the preceding), Skt. 2 sg. *á-kar-as* 'you made' for older *á-kar* < *a-kar-s*.

c.   The *s*- (sigmatic) Aorist

This aorist was formed with an **s* after the root, which had a lengthened grade (in the indicative active) or full grade (elsewhere). In Greek we never find a lengthened grade; perhaps it has disappeared through regular sound development (**dēiḱ-* > **deik-*, Osthoff's law). The *s*-aorist is found in Indo-Iranian, Greek and Slavic; in Latin some of these forms have been adopted in the perfect tense.

> *h_1é-uēǵ^h-s-* 'to carry': Skt. *ávākṣ-am*, OCS *věs-ъ*, Lat. *vēx-ī*
> *h_1é-dēiḱ-s-* 'to indicate': Av. *dāiš*, Gr. *é-deiks-a*, Lat. *dīx-ī*

18.3.2   Personal endings

The endings are the same as the secondary endings of the present tense, which were discussed in Section 18.2.2. See also the next section on 'inflection'.

18.3.3   Inflection

The athematic aorist has the same ablaut as the athematic present (full grade in the singular, zero grade in the plural):

	Skt.		Gr.	
h_1é-steh$_2$-m	ákar-am	ásthā-m	ébē-n	éthēk-a
-s	ákar	-s	-s	-as
-t	ákar	-t	-	-e
h_1é-sth$_2$-me	-ma	-ma	-men	éthe-men
-te	-ta	-ta	-te	-te
-nt ⎱		ásth-ur	éb(ēs)an	-(s)an
sth$_2$-ént ⎰	ákr-an			

Sanskrit. In 1 and 2 pl. the full grade of the root has been introduced. 3 pl. *-ur* (the perfect ending) has replaced (Av.) *-at* < **-nt*. The ending *-an* reflects **-ent*. It is thought

that the augmented forms had the zero grade, while the form without augment (the injunctive) had the full grade of the ending. For instance, in the middle we find *ákrata < *h₁é-kʷr-nto* as opposed to *kránta < *kʷr-énto*.

Greek. In *ébēn* the full grade has been generalized, but the zero grade appears from *éban* (< *h₁é-gʷh₂-(e)nt*) and from 3 du. *bátēn < *gʷh₂-*. In *éthēka* the ablaut is preserved (*éthemen < *-dʰh₁-*), but in the singular a *-k-* has been added. The 3 pl. *éban* and *éthean* are the oldest forms. The latter must have replaced *éthat < *h₁é-dʰh₁-nt*.

The thematic aorist is inflected in exactly the same way as the thematic imperfect; see further 18.2.2, point b.

The *s*-aorist is conjugated as follows (Skt. *ji-* 'to conquer'; Gr. *deik-* 'to display'; OCS *ved-* 'to transport', *děla-* 'to do'):

	Skt.	Gr.	OCS	OCS
*-s-m	ájaiṣam	édeiksa	věsъ	dělaxъ
-s	ájais	édeiksas	(vede)	děla
-t	ájais	édeikse	(vede)	děla
-me	ájaiṣma	edeíksamen	věsomъ	dělaxomъ
-te	ájaiṣṭa	edeíksate	věste	dělaste
-nt	ájaiṣur	édeiksan	věsę	dělašę

Sanskrit. In 2 and 3 sg. the endings *-s* and *-t* were lost by regular sound law. At a later stage, the endings *-īs*, *-īt* (< *-H-s*, *-H-t*) were adopted from roots ending in laryngeal. 3 pl. *-ur* is the ending of the perfect. Avestan still has *-aṯ < *-ṇt*.

Greek. 1 sg. *-a < -m̥*. 2 sg. is 1 sg. + *-s*; 3 sg. *-e* was taken from the perfect; 1 and 2 pl. have *-a-* from 3 pl. The 3 pl. ending *-ṇt* gave *-a[t] > -a*, to which *-n* (from *-nt* after a vowel) was added.

Slavic. 1 sg. *-ъ < -om* (thematic), *dělaxъ* has *x < s* from forms where the *s* occurred after *i, u, r* or *k*. 2 and 3 sg. *vede* are no *s*-aorist forms (which would have been *uēd-s-s/t > *vē*). *děla < -ās, -āst*. 1 pl. also has acquired the thematic vowel *-o-*. 3 pl. *-ę < *-ṇt*.

The *s*-aorist had the lengthened grade of the root in all of the indicative, and a full grade everywhere else. This can be explained by the fact that the stress always remained on the root (which means that it had a static inflection, cf. Section 18.7), and because the vowel was lengthened in PIE monosyllables. In the Rigveda we can still see that in the injunctive, that is, the forms without augment, the monosyllabic forms (2 and 3 sg. *dēiḱ*, *dēiḱst*) have lengthened vowels, while the others do not. In the indicative, the lengthened vowel became generalized.

18.4   The perfect

18.4.1   Stem formation

The perfect tense had no suffix. It often, but not always, had reduplication. Indo-Iranian and Greek almost always have reduplication; a notable exception is *$uoid$-h_2e 'I know'. Latin often has no reduplication, Germanic seldom.

The PIE perfect tense had an accented *-ó- in the root in the singular, and a zero grade in the plural. See further under inflection.

18.4.2   Personal endings

Singular. The reconstruction of the endings is primarily based on Sanskrit and Greek. At first glance, they point toward *-a, *-t(h)a, *-e for 1, 2 and 3 sg. The *-a must reflect *-h_2e. The laryngeal is still visible in Hittite *h*. Luwian has -ha; Hitt. -un comes from elsewhere. *-th_2e also explains the aspiration of Sanskrit (*$uoid$-ta > Gr. *oista; the *th* of Greek is unclear). 1 sg. *-h_2e versus 3 sg. *-e is confirmed by Skt. jagáma : jagā́ma; in 3 sg. *-g^wome the *o* became ā according to Brugmann's law, whereas in 1 sg. *-g^womh_2e this is not the case (see Section 11.6.2). Roots ending in a laryngeal have 3 sg. -au in Sanskrit, for example *dadáu*, of which the explanation is still uncertain.

PIE	Skt.	OCS	Toch. B	Hitt.	Hitt
*$uóid$-h_2e	véda	vědě	kautāwa	(ār-hhi)	ār-hhun
-th_2e	véttha	věsi	kautāsta	(-tti)	-tta
-e	véda	věstъ	kauta	(-i)	-s
*uid-mé	vidmá	věmъ	kautām(o)	(ar-ueni)	ar-uen
-(h_1)é	vidá	věste	kautās(o)	(-tteni)	-tten
-r/ēr	vidúr	vědętъ	kautāre	(-anzi)	-er

	Gr.	Lat.	OIr.	Goth.
	oĩda	vīdī	-cechan	wait
	oĩstha	vīdistī	-cechan	waist
	oĩde	vīdit	-cechain	wait
	ídmen	vīdimus	-cechnammar	witum
	íste	vīdistis	-cechnid	wituþ
	ísāsi	vīdēre, -ěrunt	-cechnatar	witun

Plural. 2 pl. was *-e judging by Sanskrit. Everywhere else the form is identical to that of the present (*-te), thus *-e (*-h_1e?) must be old. — The 3 pl. is more problematic.

The forms with *-t-* (Gr. *-āsi* < *-a-nti*) must be those of the present tense, therefore those with *-r-* must be old. Phrygian also has a form with *-r-*, *dakar*(*en*) 'they have made' (cf. Lat. *fēcēre*). Skt. *-ur* reflects *-r̥s*, which is confirmed by OAv. *cikōitərəš*; the origin of the *-s* is unclear. Avestan has *-arə* elsewhere (*vīδarə*), which is based on *-r̥*. Lat. *-ēre* (clearly < *-ēr-i*), *-ērunt* (a contamination of *-ēre* and *-erunt*, of which the explanation is unclear) point toward *-ēr*. Av. middle *ā̊ŋhāirē* 'they sit' (< *ās-ār-ai*) may also point to *-ēr*. In this way we arrive at *-r̥* and *-ēr*. The origin of this vacillation may lie in a reduplicated form (e.g., *gʷé-gʷm-r* 'they have come') as opposed to an unreduplicated one (e.g., (*uid-ér* 'they see'), or in static as opposed to mobile inflection (see Section 18.7).

OCS has *vědě* < *-a-i*, with an added *-i*; the other endings are those of the present. Latin also has *-i* added to all of its singular endings and to the 3 pl. In 2 sg. and pl. the element *-is-* is unclear. The palatal *n* of OIr. 3 sg. *-cechain* points toward *-e*; in 1 sg. *-cechan* the ending was not *-e*. The OIr. 1 pl. was transformed after the 3 pl. The 3 pl. has *-t-* from the *t*-preterit. Goth. 3 pl. *-un* < *-n̥t*; the *-u-* was transferred from there to the other persons.

Hittite only has a present tense and a preterit (just as Gothic; thus not an imperfect *and* a preterit / perfect; there is also no aorist). There are two types of present: one ending in (1 sg.) *-mi* and another in *-hi*. Probably the *hi*-present is derived (in part) from the old perfect tense, by addition of the primary feature *-i* (and in 3 pl. by the use of *-anzi*). Old Hittite 1 sg. *-he*, 3 sg. *-i* points toward *-hai* < *-h₂ei*, *-ei*. The 3 sg. pret. *-s* is perhaps taken from the *s*-aorist.

Note that the perfect has no primary : secondary opposition (the opposition is recent in Hittite); compare below on the pluperfect.

18.4.3   Inflection

The ablaut *o/Ø* is clearly seen in Indo-Iranian, Greek and Germanic. Other moods than the indicative are seldom found.

PIE probably did not have a pluperfect ('he had given'). Sanskrit and Greek have completely different forms; in Sanskrit the pluperfect is made with the secondary ending of the present (*á-ja-grabh-am*), while in Greek it was made simply through the addition of the augment.

Exercise 56

State for the following verb stems whether they are present, aorist or perfect. Sometimes more than one answer is correct:

a.   *h_2elh_2-/ *h_2lh_2- 'to wander'
b.   *g^hi-g^heh_1- 'to come'
c.   *$ǵ^hrs$-ié- 'to get stiff'
d.   *dēuk-s- / *deuk-s- 'to pull'
e.   *$k^wélh_1$-d^he- 'to appear'
f.   *iem-/*im- 'to stretch'
g.   *strnéh$_3$- / *strnh$_3$- 'to spread' (√ *sterh$_3$-)
h.   *g^hend- / *g^hnd- 'to catch' (√ *g^hed-)
i.   *dolǵ^h-éie- 'to split'
j.   *b^he-b^hoih_2- / *b^he-b^hih_2- 'to fear'
k.   *mesg-e- 'to immerse'

Exercise 57

Provide the required verb stems to the given roots:

a.   *leis   perfect
b.   *ǵneh$_3$ s-aorist
c.   *ies   reduplicated pres.
d.   *ḱleu   nasal pres.
e.   *deḱ   s-present
f.   *$h_2$melǵ   athematic pres.
g.   *$h_2$merd   causative
h.   *b^heud^h root aorist
i.   *uers   thematic pres.

18.5   The middle

18.5.1   Stem formation

In Sanskrit and Greek middle forms can be formed beside the indicative active of all presents and aorists (in fact, beside the subjunctive, optative and imperative, the participle and the infinitive as well). Greek and Sanskrit also have middle forms of the perfect, but these must be recent; see the following section and 18.9 and 10.

Some verbs only have middle forms ('media tantum' or deponentia). They display all possible stem formations:

Skt. *śáy-e*, Gr. *keĩ-mai* 'to lie'
Skt. *sác-a-te*, Gr. *hép-o-mai*, Lat. *sequ-o-r*, OIr. *sech-i-thir* 'to follow'
Gr. *dérk-o-mai* 'to see'
Gr. *gí-gn-o-mai* 'to be born'

See also Section 18.10.

18.5.2 Personal endings

Skt.	Hitt.	Toch. A/B	Gr.	Lat.	OIr.	Goth.
			PRIMARY			
-e	-hha(ha)(ri)	-ār/-mar	-mai	-or	-ur	-da
-se	-tta(ri)	-tār/-tar	-sai	-ris	-ther	-za
-te, -e	-(tt)a(ri)	-tär	-tai, -toi	-tur	-thir	-da
-mahe	-wasta(ri)	-mtär	-metha	-mur	-mir	-nda
-dhve	-ttuma(ri)	-cär/-tär	-sthe	-minī	-the	-nda
-nte, -re	-anta(ri)	-ntär	-ntai	-ntur	-tir	-nda
			SECONDARY			
-i	-hha(ha)t(i)	-e/-mai	-mēn			
-thās	-ttat(i)	-te/-tai	-so	-re	-the	
-ta, -a	-(tt)at(i)	-t/-te	-to			
-mahi	-wastat(i)	-mät/-mte	(-metha)			
-dhvam	-ttumat(i)	-c/-t	(-sthe)		-d	
-nta, -ra(n/m)	-antat(i)	-nt/-nte	-nto			

PIE intransitive	*-h$_2$			transitive *-mh$_2$
	*-th$_2$o			*-sth$_2$o
	*-o			*-to
	*-med^{h}h$_2$			*-med^{h}h$_2$ (*-mesd^{h}h$_2$)
	*-d^{h}ue			*-td^{h}ue
	*-ro			*-ntro

The historical interpretation of these endings is far from simple. Scholars have therefore not achieved full agreement. The following seems to me to be the correct approach. There are two important, general questions. The first is about the relation which the *r*-forms have to the other forms, and the second is about the primary : secondary relation.

The *r*-forms do not appear in all forms, except in Tocharian: the 2 sg. (OIr. imp. *-the*) and pl. do not have *-r*. But there is one branch of IE, namely Indo-Iranian, in

which -*r* appears in one form only: 3 pl. -*re*, -*ra(n/m)* in some forms. It is thus easy to assume that -*r* has spread in some languages from the 3 pl. into other persons, or has entirely disappeared (so as, for example, in Greek). This -*r*- reminds us of the 3 pl. ending *-*r*, *-*ēr* of the perfect tense, and that is probably no coincidence because, as we shall see, the singular endings of the middle are also very similar to those of the perfect (cf. Hittite).

From this it follows that *-*r* was not the characteristic of the primary endings. But neither was the *-*i* of Sanskrit and Greek the marker of the primary ending in PIE, because the languages which generalized *-*r* show no trace of *-*i*. It is understandable that, in some languages, the marker of the primary endings of the active (the -*i*) came to be used for the middle too. The conclusion is that there was no opposition between primary and secondary. (In Section 18.10 we shall see that the perfect endings can be considered as secondary endings of the middle.) This implies that we may also use the secondary endings for the reconstruction of the (single) system of middle endings, leaving out of consideration those elements which indicate primary and secondary (in the individual languages).

Singular. (Compare also Section 11.6.2.) 1 sg. Greek has -*mai*, but -*toi* (in Arcado-Cypriot and Mycenaean); the *a*-vocalism in the 1 sg. must therefore be old. Hittite points toward a laryngeal, which must have been *-*h$_2$. Skt. -*i* indicates that the ending consisted of the single laryngeal. Gr. *-*mai* and *-*mām* can then be explained as reflecting *-*maH* < *-*mh$_2$* (+ i/m). Lat. -*or* = -*ō* + *r*. — 2 sg. The Hittite, Tocharian and Celtic forms suggest that Skt. -*thās* is the older form; this must have had *-*th$_2$-*, probably *-*th$_2$o*. The *s*-forms are based on the active endings (*-*s*, *-*si*). Lat. -*re* < *-*so*. — 3 sg. -*to* is clear, but there was also *-*o* (more on this ending below).

Plural. 1 pl. Skt. -*mahi*, Gr. -*metha* point toward *-*med^{h}h$_2$*. But Greek also has -*mestha*, which seems similar to Hitt. -*wasta* (for the *w*- cf. act. -*weni*). — 2 pl. Skt. -*dhve*, -*dhvam* points toward *-*d^{h}wa*, which must go back to *-*d^{h}ue* together with Gr. -*sthe*. — The 3 pl. is very complicated. We see among other forms, *-*nto* and *-*ro*.

In Sanskrit one can still see that 3 sg. -*a*, -*e*, 3 pl. -*ra*, -*re* are only found with middle forms that have an intransitive meaning. It now seems probable that these intransitive middles (with *-*o*, *-*ro*, for example Skt. *śáy-e*, PIE *-*ḱéi-o* 'he lies') were the oldest type, which served as the basis for middle forms to transitive verbs (Gr. *loúetai* 'he washes for himself'). It was concluded a long time ago that *-*to* probably originated from *-*t* + *-*o*. It now seems that for all persons such endings existed, which were a combination of the secondary active ending followed by the (intransitive) middle endings, thus *-*m-h$_2$*, *-*s-th$_2$o*, etc. The adoption of the primary active form as a basis led to 1 pl. *-*mes-d^{h}h$_2$-*. — It is understandable that the system *-*to*, *-*ntro* was transformed to *-*to*, *-*nto* on the model of the active. Italo-Celtic went a step further. Here transitive *-*to*, *-*nto* was transformed to *-*toro*, *-*ntoro* on the analogy of intransitive *-*tro*, *-*ntro* (which had arisen from *-*o*, *-*ro*). Indeed, in Celtic

the deponents (intransitive) can be explained from *-*tro*, but the passive (= transitive) requires a preform *-*toro.*

18.5.3 Inflection

The middle forms have the zero grade of the root in the normal (mobile) inflection. In the static inflection, however, they take the full grade, just like the *s*-aorist.

The thematic forms have no ablaut. The diagram on this page gives some examples (Skt. *brū-C*/*bruv-V* 'to say' < **mluH-*, the zero grade of **mleuH-* > *bravī-ti*; *bhū-* 'to be'; *kr̥-* 'to do'; *stu-* 'to praise'; Gr. *do-* < **dh₃-* 'to give'; *hépomai* 'to follow'; *deik-* 'to indicate'.)

Athematic present		Thematic present	
bruv-é	*dído-mai*	*bháv-e*	*hép-omai*
brū-ṣé	*-sai*	*-ase*	*-ei < -eai*
-té	*-tai*	*-ate*	*-etai*
-máhe	*-metha*	*-āmahe*	*-ómetha*
-dhvé	*-sthe*	*-adhve*	*-esthe*
bruv-áte	*-ntai*	*-ante*	*-ontai*
Imperfect			
ábruv-i	*edidó-mēn*	*ábhav-e*	*heip-ómēn*
ábrū-thās	*-so*	*-athās*	*-ou*
-ta	*-to*	*-ata*	*-eto*
-mahi	*-metha*	*-āmahi*	*-ómetha*
-dhvam	*-sthe*	*-adhvam*	*-esthe*
ábruv-ata	*-nto*	*-anta*	*-onto*
Athematic aorist		**s-aorist**	
ákr-i	*edó-mēn*	*ástoṣ-i*	*edeiks-ámēn*
ákr̥-thās	*-u*	*-ṭhās*	*-ō < -ao*
-ta	*-to*	*-ṭa*	*-ato*
-mahi	*-metha*	*-mahi*	*-ámetha*
-dhvam	*-sthe*	*ástoḍhvam*	*-asthe*
ákr-ata	*-nto*	*ástoṣ-ata*	*-anto*

> **Exercise 58**
>
> Reconstruct the PIE preforms of the following Skt. forms:
>
> Skt. *áśret* 3sg.aor.ind.act., *śráyate* 3sg.pres.ind.med., *śiśráya* 3sg.pf.ind.act.: to PIE **ḱlei-* 'to lean'

Exercise 59

Indicate for the following Avestan verb forms whether their ending belongs to the active, the middle, or the intransitive middle (compare the forms given for Skt. to arrive at the answers):

a. *barənti* (3 pl. to pres. *bar-a-*)
b. *dadᵊmaⁱdē* (1 pl. to pres. *dad-/dᶻd-*)
c. *mąsta* (3 sg. to aor. *man-s-*)
d. *mruiiē* (**mluH-ai*, 3 sg. to pres. *mrauu-/mrū-*)
e. *vinasti* (3 sg. to pres. *vinad-/viṇd-*)
f. *fra-caraθβe* (< **-δβe*, 2 pl. pres. to *car-a-*)

18.6 The dual

Personal endings:

PIE	Skt.	Av.	OCS	Lith.	Toch.	Gr.	Goth.
			PRIMARY				
*-ues	*-vas*	*-uuahi*	*-vě*	*-va*		-	*-(o)s*
*-tHe/os	*-thas*	?	*-ta*	*-ta*		*-ton*	*-ts*
*-tes	*-tas*	*-tō*	*-te*		*-/teṇ*	*-ton*	-
			SECONDARY				
*-ue	*-va*	*-uua*				-	*-u, -wa*
*-tom	*-tam*	?				*-ton*	*-uts*
*-teh₂m	*-tām*	*-təm*			*-enas/-ais*	*-tēn*	-

A complete reconstruction of the paradigm is no longer possible: there is too little data, and it points in different directions.

Primary. 1 du. Goth. *-(o)s* must reflect **-oues*. The Slavic form has *-ě* analogically after the pronouns (**-ues* would have yielded Sl. **-ve*). Hitt. 1 pl. *-uen*(*i*) perhaps stems from the dual. — 2 du. perhaps had **-th₁-*, as did the 2 pl. — 3 du. Skt. *-tas*, OCS *-te* must continue **-tes*.

Secondary. 1 du. Goth. *-u* < **-ue*; for *-wa* compare 1 pl. *-ma*. — 2 du. In Goth. *-uts* the *-u-* is analogical after the plural endings and *-ts* could be the primary ending. Gr. *-tēn*, Dor. *-tān* can only have been **-teh₂m*.

The middle endings are:

PIE	Skt.	ath.	them.	Hitt.	Gr.
		PRIMARY			
*-ued^hh_2		-vahe	-vahe	(-wasta(ri))	-
*-(e)Hth_1-?		-āthe	-ithe		-sthon
*-(e)$Hteh_2$??		-āte	-ite		-sthon
		SECONDARY			
		-vahi	-vahi	(-wastat(i))	-
		-āthām	-ithām		-sthon
		-ātām	-itām		-sthēn

The pattern Skt. *v-*, *th-*, *t-* is the same as in the active. For prim. *-e*, sec. *-i* see the plural. The Greek forms have *-sth-* from the 2 pl. *-sthe*, and *-on*, *-ēn* as in the active. Hence, all of these forms can be innovations. If Skt. *-vahi* goes back to *-ued^hh_2 (OAv. *-uuaidī*; cf. 1 pl. med. *-mahi*, Gr. *-metha*), Hitt. 1 pl. *-wasta* must go back to *-$uosd^hh_2$. — Because the middle does not have a primary : secondary opposition, that opposition cannot be old in the dual either.

18.7   The static inflection

It has been observed that some (athematic) verbs, especially in Sanskrit, display an ablaut type which deviates from the normal kind. Whereas the usual type has full grade versus zero grade, the deviant type opposes a lengthened grade to a full grade. Compare:

ind. sg. full grade	*é-mi*	lengthened grade	*tắṣ-ṭi* < *$t\bar{e}t\acute{k}$-
	brávī-ti		*staú-ti* < *$st\bar{e}u$-
ind. pl. zero grade	*y-ánti*	full grade	*tákṣ-ati* < *$tét\acute{k}$-nti*
	bruv-ánti		
middle zero grade	*brū-té*	full grade	*stáv-e* < *steu-

In abstract terms:

normal	sg.	*CéC-mi*	static	*CéC-mi*
(mobile)	pl.	*CC-énti*		*Céc-nti*
	med.	*CC-tó*		*CéC-to*

The second type was called 'proterodynamic' by Johanna Narten in 1968 (meaning that the stress — sometimes — occurred one syllable further to the beginning of the word than normally was the case). Yet the important principle here is that in the

normal type the accent is mobile, while in the second type it remains on the root. The term 'static' is therefore preferable.

The ablaut can be understood from the accent: the root always has full grade, but in monosyllabic forms, vowel lengthening occurred. The 2 and 3 sg. of the injunctive were monosyllabic, for example, Skt. *staut*. From such forms, the long vowel was introduced into all of the singular.

We already saw that the *s*-aorist had static inflection. Since the aorist takes only secondary endings, monosyllabic forms were relatively strong in the *s*-aorist paradigm, which is why all of the indicative came to acquire the long vowel.

There were also media tantum with static inflection, for example Skt. *śáy-e*, Gr. *keî-tai* 'he lies' < *ḱéi-o*.

Perhaps some perfects with a long vowel belong here too: Gr. *gégōne* 'he made himself heard', *eíōtha* < *se-suōdʰ-* 'I am used to'.

It is as yet unknown why some verbs had the static inflection and others did not. Some scholars have speculated that certain roots always had an 'upgraded' kind of ablaut, that is to say, *ē*-grade in formations which normally have *e*-grade, and *e*-grade instead of normal zero grade forms. Roots with this alleged behaviour have been called 'Narten roots'. Yet it has proved impossible to define which roots would take this special kind of ablaut and which would not. Most of the long-vowel words adduced as evidence for this theory must be explained within the individual branches of Indo-European, or from lengthening in PIE monosyllables.

18.8   The moods

18.8.1   The indicative

Until now, we have limited ourselves to the indicative. The indicative is used for factual statements. The indicative of the present, with primary endings, indicated that the action referred to was taking place during the speech act. The indicative of the past tense (imperfect or aorist) indicated that the action referred to took place before the speech act. The past tense forms were characterized by secondary endings and the augment.

18.8.2   The injunctive

The injunctive is defined as a form with secondary endings without augment. It therefore neither indicated the present nor the past. Thus it could easily indicate intention: Skt. *índrasya nú vīryàṇi prá vocam* (inj.) 'Indra's heroic deeds will/shall I now declaim'. It was also used for an imperative form. The 2 pl. of the imperative is always the injunctive form. In Sanskrit the injunctive is obligatory in the case of all prohibitions:

mā́ na, indra, párā vr̥ṇak (inj.) 'Do not forsake us, Indra'. In Greek the injunctive forms are completely equal to the indicative forms (*bē̃* = *ébē* 'he went'); in this case, it makes no sense to speak of an injunctive (because there is no semantic component). Only in Sanskrit can one speak of an injunctive.

18.8.3 The subjunctive

The subjunctive had thematic inflection and primary endings:

	ATHEMATIC STEMS		THEMATIC STEMS	
-oH	Skt. *ás-ā(ni)*	Lat. *er-ō*	Skt. *bháv-ā(ni)*	Gr. *skh-ō̃*
-eh₁i	*-as(i)*	*-is*	*-ās(i)*	*-ē̃is*
-e	*-at(i)*	*-it*	*-āt(i)*	*-ē̃i*
-omom	*-āma*	*-imus*	*-āma*	*-ō̃men*
-eth₁e	*-atha*	*-itis*	*-ātha*	*-ē̃te*
-o	*-an*	*-unt*	*-ān*	*-ō̃si*

Lat. *erō* is a future ('I shall be') derived from a subjunctive.

The subjunctive is always 'thematic', which is to say that it has *e or *o + the thematic endings (*-H, *-h₁i, zero, *-mom, *-th₁e, zero). For this reason, if the subjunctive inflection occurred with thematic verbs (which already had a suffix *e/*o), the *e or *o was doubled and the result was *ē, *ō: 1 sg. *-o-oH, 3 sg. *-e-e, etc. Probably, such forms only came into being after PIE; they are only known from Indo-Iranian and Greek. In Old Avestan they are still disyllabic, *xšaiiā* = /xšayaā/, *hacå̄ṇtē* = /hacaantai/.

It is remarkable that the Sanskrit paradigm combines primary and secondary endings (*-ni* is a particle; *-ā*, *-si*, *-ti* and *-tha* are primary, *-ma* and *-(a)n* are secondary). Apparently Sanskrit has used the secondary athematic endings (later replaced by primary *-si*, *-ti*) to replace those (primary) thematic endings which have not been preserved in this language (2 + 3 sg., 1 + 3 pl.). Greek also has traces of this situation (in the dialects).

The subjunctive always has full grade in the root (Skt. *as-*, Lat. *er-* < *h₁es-* as opposed to *h₁es-/*h₁s-* in the indicative). This is most apparent in the middle, where Sanskrit has zero grade in all indicative forms, for example *brū-té*, but sub. *bráv-a-te* (*mluH-/*mleuH-). This suggests that the middle subjunctive is secondary, and that the subjunctive stood apart from the other forms (in contrast to the optative). This is confirmed by cases where the oldest system has an active subjunctive together with middle forms: Skt. ind. aor. middle *a-v(u)r-i*, sub. act. *vár-a-t*, opt. middle *vur-ī-ta* (*uelH-* 'to want').

Both Sanskrit, where, for example, *karat(i)* is the subjunctive to (pres.) *kr̥ṇómi*, and Latin, with the old subjunctive *tagam* alongside the present *tangō*, suggest that the

subjunctive was originally formed from the root, not from the present or aorist stem. That means that the subjunctive (to be) was originally an independent formation (a thematic present), and that each root only had one subjunctive.

18.8.4 The optative

The optative was formed with the suffix *-ieh_1-/*-ih_1-, with secondary endings. In the thematic inflection we find -oi- < *-o-ih_1-.

PIE	Skt.	Gr.	Lat.	Goth.
		ATHEMATIC		
*h_1s-$iéh_1$-m	s-yā́-m	eíēn	siem, sim	ber-jau
-s	-s	-s	siēs, sīs	-ei
-t	-t	-	siet, sit	-i
*h_1s-ih_1-$mé$	-ma	eĩmen	sīmus	-eima
-té	-ta	-te	sītis	-eiþ
*$h_1és$-ih_1-nt	s-y-úr	-en	sint, sient	-eina
		THEMATIC		
*$bʰér$-oih_1-m	bhár-eyam	phéroi-mi, -oia		bair-au
-s	-es	-s		-ais
-t	-et	-		-ai
-me	-ema	-men		-aima
-te	-eta	-te		-aiþ
-ent	-eyur	-en		-aina

Sanskrit has generalized -yā, and has -ur instead of *-at < *-ṇt. Old Latin still has -iē-. Only the verb 'to be' still preserves the old optative paradigm in Latin. Gothic generalized -ī- < *-ih_1-. 1 sg. -au reflects the thematic form *-oih_1m > *-ajun > -au. OCS has ě < *oi in 2 pl. bǫděte, which became an imperative.

Because the 3 pl. had zero grade both in the ending and in the suffix, the root must have had full grade. This is confirmed by roots ending in laryngeals, which were puzzling until recently, as in Skt. deyā́m from the root dā- 'to give'. The -e-, PIIr. *-ai-, comes from *deh_3-ih_1-nt > *daHi-; in the 1 pl., this yielded *daīma > *daima > *demá. This was then remade into deyā́ma, by which means the stem deyā- was formed.

Reduplicated optatives had the zero grade of the suffix everywhere. Av. daidīṭ < *$dʰe$-$dʰh_1$-ih_1-t. There are also traces of static inflection elsewhere. OAv. varǝzimā < *$uerǵ$-ih_1-me 'may we work'; Lat. velīmus, Goth. wileima '(may) we wish to' < *$uélH$-ih_1-me. But perhaps these forms are analogical after the 3 pl. This type is also expected in the s-aorist, which always follows the static inflection: Gr. Cret. lus-ian < -ih_1-$ṇt$. Normally, Greek has -sai-mi etc., with -a- from the indicative.

Middle. We find the following endings:

PIE	Skt.	Gr.	Goth.
ATHEMATIC			
*-ih_1-h_2	bruv-īyá	theímēn	
-th_2ó	-īthā́s	theīo	
-ó	-ītá	theīto	
-méd^hh_2	-īmáhi	theímetha	
-d^hué	-īdhvám	theīsthe	
-ró	-īrán	theīnto	
THEMATIC			
*-oih_1-h_2	bhár-eya	pher-oímēn	bair-aidau
-th_2o	-ethās	-oio	-aizau
-o	-eta	-oito	-aidau
-méd^hh_2	-emahi	-oímetha	(-aindau)
-d^hue	-edhvam	-oisthe	(-aindau)
-ro	-eran	-ointo	-aindau

According to Skt. 3 pl. -ran the optative had the intransitive middle endings. 3 sg. *-ih_2-o > Skt. *-iya was replaced by -ī + ta. The Skt. 1 sg. arose from the following proportional analogy: ind. 1 -e : 3 -te = opt. 1 X : 3 -ta; X = -a. — Greek has the usual middle endings. — Gothic has -u, probably from the 1 sg. opt. them. act., added to the normal middle ending.

18.8.5 The imperative

There were two systems (I and II).

	Skt. I	II	Hitt.	Gr.	Lat. I	II	Goth.
ACTIVE ATHEMATIC							
2.	i- hí	i-tā́t	ep	í-thi	ī	itō	
3.	é-tu	i-tā́t	epdu	í-tō		itō	
2.	i- tá	i-tā́t	epten	í-te	īte	itōte	
3.	y-ántu		appandu	i-óntōn		euntō	
ACTIVE THEMATIC							
2.	bhár-a	-atā́t		phér-e	age	agitō	bair
3.	-atu	-atā́t		-étō		agitō	bair-adau
2.	-ata			-ete	agite	agitōte	-iþ
3.	-antu			-óntōn		aguntō	-andau

PIE	athem. I	II	them. I	II
	Ø, *-*dʰi*	*-*tōd*	*-*e*	*-*etōd*
	*-*tu*	*-*tōd*	*-*etu*	*-*etōd*
	*-*te*	*-*tōd*	*-*ete*	*-*etōd*
	*-*entu*		*-*ontu*	

From Sanskrit and Latin it appears that there were two systems. The imperative II had *-*tōd* and indicated that an action in the (near) future was supposed to take place ('then you must…'). PIE *-*tōd* could be the ablative of the pronoun *to*, meaning 'from then onwards'. This element was used in 2 and 3 sg. and 2 pl., and perhaps also in the middle.

2 sg. One finds either the single stem (with full grade, Lat. *ī* < *h₁ei*; it is unclear to what extent *-*e* may be called the stem with thematic verbs), or an ending *-*dʰi*, usually with zero grade. — 3 sg. *-*tu* must be the secondary ending *-*t* + the particle *-*u*. Goth. *-adau* is unclear. — 2 pl. *-*te* is the secondary ending.

Middle. The endings are as follows:

Skt			Hitt.		Gr.	Lat.		
tr.	intr.	II	tr.	intr.		I	II old	recent
-sva			-hhut		-(s)o	-re	-tōd	-tor
-tām	-ām	-tāt	-ttaru	-aru	-sthō		-tōd	-tor
-dhva(m)		-tāt	-ttumat		-sthe	-minī		
-ntām	-rām		-antaru		-sthō(n)		-ntōd	-ntor
PIE	trans.		intr.	II				
	*-*sue*?							
	*-*to*?		*-*o*?	*-*tōd*				
	*-*dʰue*			*-*tōd*				
	*-*nto*?		*-*ro*?					

2 sg. Skt. *-sva* is unknown elsewhere, and is thus old. (One would expect *-*sth₂o*, intrans. *-*th₂o*.) *-*so* (Lat. *-re*) is the younger secondary ending. — 3 sg. Skt. *-ām*, *-tām* is also a specific ending. It is based on *-*o*, *-*to* (cf. Hittite) with a particle. The Greek form must have *-sth-* from the plural and *-ō* from act. *-*tō(d)*. The Latin and Hittite endings are recent formations. — 2 pl. is the secondary ending. — 3 pl. All forms are transparent, and thus probably recent.

It is doubtful whether *-*tōd* is old in the middle; Sanskrit only has a few forms.

Exercise 60

State for the following verb forms from athematic stems whether they are indicative, injunctive, imperfect, subjunctive, optative or imperative.

a.   *$g^{wh}n$-énti
b.   *b^hug^h-d^hi
c.   *$h_1$éi-omom
d.   *kés-i$h_1$nt
e.   *mi-mn-ués
f.   *str-n-h_3-té
g.   *h_1m-s-iéh_1-m
h.   *ték̑-eh_1i
i.   *b^hud^h-eh_1-tu
j.   *h_2e-$h_2$og̑-e

Exercise 61

Form the required verb forms to the given roots:

a.   *teng- 'make wet': s-aor. 3sg.ind.act.
b.   *pelh_2- 'to approach': nasal pres. 1sg.inj.act.
c.   *per- 'to cross': o-grade caus.pres. 2pl.opt.act.
d.   *k̑leu- 'to hear': root aor. 3pl.inj.act.
e.   *$h_2$ueh_1- 'to blow': subj. 3sg.act.
f.   *de/i-dk̑- 'to receive': redupl.pres. 3sg.opt.act.
g.   *demh_2- 'to tame': nasal pres. 3sg.imptv.act.
h.   *leg̑^{h}- 'to lie': intrans. middle (stative) 3sg.ind.
i.   *sek^w- 'to follow': thematic trans. middle 3pl.ind.
j.   *d^hers- 'to dare': perfect 2sg.ind.
k.   *ueid- 'to see': perfect 3pl.ind.
l.   *deh_3- 'to give': redupl. pres. 1du.inj.act.

Exercise 62

Reconstruct the PIE preform of the given verb forms:

a.   Skt. bhindánti 'they split' (root *b^hid-) pres.ind.act.
b.   Hitt. kuerzi 'he cuts' (root *k^wr-) pres.ind.act.
c.   Skt. dviṣṭé 'is hated' (root *du̯is-) pres.ind.mid.
d.   Av. dāraiiōiš 'may you hold' (root *d^her-) pres.opt.act.
e.   Lat. siēs 'may you be' (root *h_1s-) pres.opt.act.
f.   Gr. éstēn 'I stood' (root *sth_2-) aor.ind.act.
g.   Gr. éoike 'she appears' (root *uik̑-) pf.ind.act.

18.9   The nominal forms

18.9.1   The participles

PIE had a number of participles which played an important role in the language. The oldest languages rely heavily on the use of participles. There were probably no subordinate clauses in PIE.

Active: present, aorist. The participle was formed with *-(e)nt-*. The inflections, either hysterodynamic or static, have already been examined in Section 13.2.5, under point f, and in 13.2.7. A few examples:

> Skt. pres. *adánt-* 'eating', *yánt* 'going' (*h_1i-ent-*); them. *bhárant-* 'carrying'; s-aor. *dhák-ṣ-at* 'burning' < *-s-ṇt*
> OCS *nesy, nesǫšt-* 'carrying' < *-ont-i̯-*; Lith. *nešą̄s, -ant-*
> Hitt. *kunant-* 'killed' from *kuen-*
> Toch. A *aśant-*, Toch. B *aśeñca* 'transporting' (PIE *$h_2eǵ$-*)
> Gr. *titheís < -ent-s, iṓn, phérōn*, s-aor. *deiksant-*
> Lat. *ferēns < *-ent-s, -ent-* 'carrying', *iēns* 'going'. Goth. *bairands*

The thematic participle had no ablaut, as in Avestan: always *-ont-*, for example Av. gen. *-aṇtō < *-ont-os*. Sanskrit was the only language to adopt the athematic ablaut *-ont-/*-nt-*, for example gen. *-atas < *-nt-os.*

In Hittite the participle has passive (or intransitive) meaning. Whether the original meaning was neutral ('which has something to do with …') is uncertain.

Active: perfect. The suffix was *-ues-*. The inflection has already been discussed in Section 13.2.5 g. A few examples:

> Skt. *vid-vā́n, -uṣ-* 'knowing'
> OCS *nesъ, -ъš-* 'having carried' < *-us-i̯-*
> Lith. *lìk-ęs, -us-* 'having left' (with transformed nominative *-uents*)
> Toch. A *papräku*, Toch. B *peparku* 'having asked'
> Gr. *eidṓs* 'knowing' < *ueid-uōs*, feminine *iduĩa < *uid-us-ih$_2$*
> Goth. (only lexicalized, that is to say, made into a substantive) *berusjos* 'parents' < 'who have carried'

Middle. The suffix *-mh$_1$no-* makes middle participles. This looks like a compound suffix, made from the zero grade of the suffix *-h$_1$en-* (Section 13.1.2) after a verbal noun in *-m-*. For the forms see Section 10.5. Examples:

> Skt. *sáca-māna-* 'following', *dá-dh-āna-* 'laying', *śáyāna-* 'lying'
> Av. *barəmna-* 'riding (a horse)'
> Arm. (lexicalized, e.g.) *anasun* 'animal' = 'not-speaking', *-un < -omnós*

Toch. A *klyosmāṃ*, Toch. B *klyausemane* 'hearing'
Phryg. *tetikmenos* 'cursed'
Gr. *hepómenos* 'following'

Traces in Latin are *alumnus* 'pupil' < **alo-manos*, to *alō* 'to feed', and *fēmina* 'woman' = 'nursing' (*d^heh_1- 'to suck').

18.9.2   The verbal adjective

This is an adjective that is not derived from a tense stem, as is the participle, but from a root. The most frequently found is the adjective in *-*to*-; the root has zero grade.

Skt. *syūtá-* 'sewn', OCS *šitъ* < **sjū-tъ*, Lith. *siū́-tas*
Skt. *gatá-*, Gr. -*batós*, Lat. *(in)-ventus* 'arrived' < **g^wm-tó-*
Lat. *tentus* 'stretched' < **tn-to-*
Arm. *lu* 'known' < **ḱlu-tó-*
Goth. *nasiþs* 'saved' < **-tó-s*

Germanic uses this suffix to form the verbal adjective of weak verbs, as in E. *fill-ed*.
   The same function as *-*to*- was fulfilled by *-*no*-:

Skt. *bhinná-* < **b^hid-nó-* 'split'
Skt. *pūrṇá-* 'full, filled', OCS *plъnъ*, Lith. *pìlnas*, OIr. *lán*, Goth. *fulls*, all from **plh_1-no-*, Lat. *plēnus* (with full grade)

The suffix form *-*eno*- is found in OCS *vlъčenъ* 'pulled'. In Germanic *-*ono*- is used for the strong verbs: Goth. *bit-ans* < **-onos*, E. *bitten* (sometimes *-*ino*-: Runic *slaginaz*, OS *geslegen* 'beaten'). We find **-u̯o-* in the same function: Skt. *pakvá-* 'cooked'. With **-lo-* were made the past participle passive in Slavic (*nes-lъ* 'borne') and Armenian (*gereal* 'taken'). A suffix **-mo-* is found in Sankrit (*bhīmá-* 'terrible, frightening'), in Balto-Slavic in the present participle passive (Lith. *nẽšamas*, OCS *nesomъ* 'being carried', *nevidimъ* 'invisible'), in Albanian (*la-m* 'washed'), in Luwian (*kisama-* 'combed') and in Tocharian (A *pärknäm* 'asking', B *lyukemo* 'shining').

18.9.3   The verbal nouns and the infinitives

PIE probably had no infinitives, but it did have verbal nouns. An infinitive is an indeclinable form, derived from a verbal stem, for example Gr. *loũsai* 'to wash'; this form is unchangeable and derived from the aorist stem *lous(a)-*. A verbal noun, in contrast, is a (declinable) substantive, derived from the root of a verb. The difference in the syntax is important. The verbal noun is constructed as a noun, thus — for example — with the 'object' in the genitive: 'the killing of a man', as opposed to the accusative object

found with an infinitive, 'to kill a man'. Example: OIr. *guin* (verbal noun *$*g^{wh}oni$*) *duini* (gen.) 'the killing of a man'.

Such verbal nouns were formed in many ways. In the function resembling an infinitive we most often find the dative ('in order to') and the accusative (especially after verbs of movement).

Several stem types occur as verbal nouns. A root noun is: Skt. *áj-e* (dat.) 'in order to drive', Lat. *ag-ī* 'to be driven'. From the *-tu-* suffix we find the accusative in Skt. *dā́tum* 'in order to give', OCS *vidětъ* 'to see', Lith. *im̃tų* 'in order to take', OPr. *dātun*, Lat. (supinum) *vīsum* 'in order to see'; the dative in Skt. *dā́-tav-e*, OPr. *da-twei*, Lat. (supinum) *dictū*. Old Irish also has *-tu-*, as in *léciud* 'to leave'. From a *ti*-stem the dative is used in Skt. *pī-táy-e* '(in order) to drink', OCS *ves-ti* 'to transport'. Old Irish has verbal nouns with *-t-*, *-m-* and *-n-*. The Germanic infinitive goes back to (acc.) *-onom*, Goth. *it-an*, G. *essen*.

It thus turns out that there were several different formations in the oldest phase. Sanskrit, for example, has a dozen. Out of these verbal nouns, infinitives often developed in the later period. These, then, are petrified cases of verbal nouns. It is often difficult to recover the origin of these forms.

The infinitive Skt. *-dhyai*, Av. *-diiāi* (OAv. *jaidiiāi* 'to kill') is perhaps cognate with Umbr. *-fi* (*herifi* 'to wish'), which would point toward *$*-d^hiōi$*; but the interpretation is uncertain.

Exercise 63

Reconstruct the PIE active participle belonging to the following stems:

a. pres. **serp-e-* 'to creep'
b. aor. **deuk-s-* 'to lead'
c. pf. **k^weit-* 'to notice'
d. pres. **k^wer-/**k^wr-* 'to cut'
e. pres. **pu-n-H-* 'to clean'
f. pf. **steg-* 'to cover'

Exercise 64

Reconstruct the PIE preform of the given participles:

a. Skt. *ruddhá-* 'obstructed' (root **lud^h-*)
b. Lat. *calumnia* 'slander' (stem **kHl-u-*; the *io*-stem replaces an *o*-stem)
c. Skt. *ánna-* 'food' (root **h_1ed-*)
d. Gr. *átrestos* 'fearless' (root **trs-*)
e. Goth. *fulgins* 'hidden' (root **plk-*)

18.10 The PIE verbal system

After having analyzed the individual categories, we shall briefly summarize what we have discovered for PIE. Our present reconstruction differs quite a bit from the vision that was generally accepted until recently. For this reason it seems a good idea to begin by presenting this 'classic' picture. It used to be customary to imagine that the verbal system of PIE was in principle the same as that of Sanskrit and Greek. This can be presented schematically as follows:

		pres. ind.	imf. ind.	sub.	opt.	imp.	ATH.	THEM.
PRES.	act.	+	+	+	+	+	+	+
	med.	+	+	+	+	+	+	+
AOR.	act.	−	+	+	+	+	+	+?
	med.	−	+	+	+	+	+	+?
PF.	act.	+	−	+	+	+	+	−
	med.	?	−	?	?	?	?	−

Now compare the following overview of the verbal endings which we have reconstructed in this book:

ATHEMATIC			THEMATIC			STATIVE	
1	2	2–5	3	4	4–5	5	6
prim. pres.	sec. aor.	trans. middle	prim.	sec.	trans. middle	intrans. middle	pf.
-mi	*-m*	*-mh$_2$*	*-oH*	*-om*	*-omh$_2$*	*-h$_2$*	*-h$_2$e*
-si	*-s*	*-sth$_2$o*	*-eh$_1$i*	*-es*	*-esth$_2$o*	*-th$_2$o*	*-th$_2$e*
-ti	*-t*	*-to*	*-e*	*-et*	*-eto*	*-o*	*-e*
-mes	*-me*	*-me(s)d^{h}h$_2$*	*-omom*	*-omo/e*	*-ome(s)d^{h}h$_2$*	*-me(s)d^{h}h$_2$*	*-me*
-th$_1$e	*-te*	*-(t)d^{h}ue*	*-eth$_1$e*	*-ete*	*-etd^{h}ue*	*-d^{h}ue*	*-(h$_1$)e*
-enti	*-ent*	*-ntro*	*-o*	*-ont*	*-ontro*	*-ro*	*-(ē)r*

The endings of the imperative are not important here; 2–5 and 4–5 came into being due to the addition of 5 to 2 and 4.

First a few details:

— The alternations *-ent(i) / *-nt(i) and *-ēr (< -er) / *-r were dependent on the accent. — The interchange *e/o* in the thematic inflection remains unexplained (1 sg. could be *-eh$_3$). — Probably simplifications had already been at work in this system. Thus, the thematic 2 pl. may have been different from the athematic form and the 1 pl.

intrans. med. $*$-$me(s)d^hh_2$ could be the transitive form, while the intransitive form was only $*$-d^hh_2.

Now for the main lines of development. We may notice the following. The present and the aorist (= secondary) endings form one system. The fact that the (primary) thematic endings are different from those of the athematic type suggests that the thematic inflection was not only the inflection of the stems which happened to end in -*e/o*, but that this was an independent category with its own meaning. It has been assumed that -*e/o*- indicated a definite object. See below under the subjunctive. That the secondary endings are identical to those of the athematic inflection requires an explanation (see below).

It is significant that the (intransitive) middle endings show a strong similarity to those of the perfect tense. In addition, an (active) perfect often has a middle present alongside it, for example Gr. *dérkomai – dédorka* 'to see'. Further, the perfect had since the earliest times no middle (and the intransitive middle — by definition — had no active). Neither of them has the opposition primary : secondary. Finally, the perfect tense usually has intransitive meaning, just as the intransitive middle. This allows us to conclude that the (intransitive) middle was related to the perfect as the present was to the aorist. The middle-perfect system is thus referred to as 'stative' because these forms indicate a state. If there had been an opposition between them such as that between imperfective and perfective (as in the Slavic languages), the PIE verb would, in its outlines, have been organized as follows (a few other points have also been worked into the scheme below):

	imperfective	perfective	transitive middle	optative
SUBJECTIVE	ath. pres.	ath. aor.	ath.	ath.
	1 $*$-mi	2 $*$-m	2–5 $*$-mh_2	$*$-ieh_1-m
OBJECTIVE	them. pres.	them. aor.	them.	them.
	3 $*$-oH	4 $*$-om	4–5 $*$-omh_2	$*$-oih_1-m
STATIVE	intr. middle	perf.	–	?
	5 $*$-h_2	6 $*$-h_2e		

The subjective inflection has no definite object, while the objective inflection always has a definite object (as in Hungarian). The imperfect is a younger derivation from the present.

The subjunctive probably first developed out of category 3. As we have seen above, there are indications that there was only one subjunctive, directly derived from the root.

It is conceivable and even probable that a root formed only one of the categories 1–6. In this way it becomes understandable that there originally was only one subjunctive, directly derived from the root. Other stems were then formed with the help

of suffixes and/or reduplication. In this way, too, it is understandable that the thematic present could function as a subjunctive (with 1–2).

The difference between the primary and secondary endings in the thematic inflection could be explained as follows. We have already discussed the hypothesis (Section 13.2.10) that PIE had an ergative system. According to this theory, the subject of PIE transitive verbs was in the ergative, while their object was found in the absolutive. The absolutive also served as the subject of intransitive verbs. This system was valid for the athematic (= subjective) inflection, for the stative (= intransitive) inflection, and for the aorist of the thematic verbs. With the present of the thematic verbs it was otherwise. (Georgian, for example, has a difference of this kind between the present and the aorist.) Here the subject would be found in the dative in the case of living creatures, and in the instrumental case with an inanimate subject.

				subject	**object**
ATHEMATIC	transitive			ergative	absolutive
	intransitive			absolutive	–
STATIVE	(intransitive)			absolutive	–
THEMATIC	(transitive)	aorist		ergative	absolutive
		present	'animate'	dative	absolutive
			'inanimate'	instrumental	absolutive

The endings would now refer to an ergative subject, but the primary thematic endings would refer to a dative subject. This reconstructions rests, however, only on an analysis of the endings, for which it provides a possible explanation; the syntax of the attested Indo-European languages works in a completely different way.

18.11 A paradigm as example

After this analytical survey we present on the next pages a complete paradigm of a present tense in Sanskrit. It is a present ending in -*no/nu*- (Skt. *cinóti* 'to gather'). Next to it are the possible PIE forms.

Once again a word of caution: it is important to remember that the Sanskrit paradigm is the reality upon which our work is based; the PIE paradigm is only a reconstruction.

SANSKRIT
(*cinóti* 'gathers')

PRESENT ACTIVE						
ind.	*ci-nó-mi*	ind.		*á-ci-nav-am*	inj. *ci-náv-am*	
pres.	*-ṣi*	imf.		*-no-s*	*-nó-s*	
	-ti			*-no-t*	*-nó-t*	
	-n-más(i)			*-n-ma*	*-n-má*	
	-nu-thá			*-nu-ta*	*-nu-tá*	
	-nv-ánti			*-nv-an*	*-nv-án*	
sub.	*ci-náv-ā(ni)*	opt.		*ci-nu-yā́-m*	imp. I	II
	-a-s			*-s*	*ci-nú(-hí)*	*-nu-tā́t*
	-t			*-t*	*-nó-tu*	
	-ā-ma			*-ma*		
	-a-tha			*-ta*	*-nu-tá, -nó-ta(na)*	
	-n			*-yúr*	*-nv-ántu*	
ptc.	*ci-nv-ánt-*					

PRESENT MIDDLE					
ind.	*ci-nv-é*	ind.	*á-ci-nv-i*	inj.	*ci-nv-i*
pres.	*-nu-ṣé*	imf.	*-nu-thās*		*-nu-thā́s*
	-té, -nv-é		*-nu-ta*		*-nu-tá*
	-n-máhe		*-n-mahi*		*-n-máhi*
	-nu-dhvé		*-nu-dhvam*		*-nu-dhvám*
	-nv-áte, -áté		*-nv-ate*		*-nv-ata*
sub.	*ci-náv-ai*	opt.	*ci-nv-ī-yá*	imp.	
	-a-se		*-thā́s*		*ci-nu-ṣvá*
	-a-te		*-tá*		*-tā́m*
	-ā-mahai		*-máhi*		
	-a-dhve		*-dhvám*		*-dhvám*
	-a-nta		*-rán*		*-nv-átām*
ptc.	*ci-nv-āná-*				

PROTO-INDO-EUROPEAN

	PRESENT ACTIVE		
ind.	$*k^wi\text{-}néu\text{-}mi$	ind. $*h_1é\text{-}k^wi\text{-}neu\text{-}m$ inj.	$*k^wi\text{-}néu\text{-}m$
pres.	-si	imf. -s	-s
	-ti	-t	-t
	-nu-més	-nu-mé	-nu-mé
	$-th_1é$	-té	-té
	-énti	-(e)nt	-ént
sub.	$*k^wéi\text{-}oH$	opt. $*k^wi\text{-}nu\text{-}iéh_1\text{-}m$ imp. I II	
	$-eh_1i$	-s $*k^wi\text{-}nú(\text{-}d^h\acute{\imath})$ -tȭd	
	-e	-t -néu-tu -tȭd	
	-omom	$-ih_1\text{-}mé$	
	$-eth_1e$	-té -nu-té -tȭd	
	-o	$-néu\text{-}ih_1\text{-}nt$ -éntu	
ptc.	$*k^wi\text{-}nu\text{-}ént\text{-}$		
	PRESENT MIDDLE		
ind.	$*k^wi\text{-}nu\text{-}mh_2$	ind. $*h_1é\text{-}k^wi\text{-}nu\text{-}mh_2$ inj.	$*k^wi\text{-}nu\text{-}mh_2$
pres.	$-sth_2ó$	imf. $-sth_2o$	etc.
	-tó	-to	
	$-me(s)d^hh_2$	$-me(s)d^hh_2$	= ind.
	$-d^hue$	$-d^hue$	
	-ntro	-ntro	
		opt. $*k^wi\text{-}nu\text{-}ih_1\text{-}h_2$ imp. I II	
		$-th_2ó$ $*k^wi\text{-}nu\text{-}sué$ -tȭd	
		-ó -tó? -tȭd	
		$-mé(s)d^hh_2$	
		$-d^hué$ $-td^hue$ -tȭd	
		-ró -ntó?	
ptc.	$*k^wi\text{-}nu\text{-}mh_1nó\text{-}$		

Exercise 65

Study the following Sanskrit paradigms, all of which continue the PIE root *gʷem-. Reconstruct the PIE form for each single form, on the model of Section 18.11. If the Skt. form cannot go back by regular sound law to the PIE form, explain which analogical remodelling(s) has/have taken place.

A. Pres.ind.act.	B. Pres.subj.act.	C. Pres.opt.act.	D. Pres.impt.med.
gácchāmi	*gácchā(ni)*	*gáccheyam*	2sg. *gácchasva*
gácchasi	*gácchās(i)*	*gácches*	2pl. *gácchadhvam*
gácchati	*gácchāt(i)*	*gácchet*	
gácchāmas(i)	*gácchāma*	*gácchema*	
gácchatha	*gácchātha*	*gáccheta*	
gácchanti	*gácchān*	*gáccheyur*	

E. Aor.ind.act.	F. Aor.subj.act.	G. Perf.ind.act.
ágamam	*gámāni*	*jagáma*
ágan	*gámas*	*jagántha*
ágan	*gámat*	*jagā́ma*
áganma	*gámāma*	*jaganmá*
áganta	*gámatha*	*jagmá*
ágman	*gáman*	*jagmúr*

18.12 Schleicher's fable

In 1868, August Schleicher published a self-invented fable called *Avis akvāsas ka* 'The sheep and the horses'. It was meant to give an idea of how PIE would have sounded. Several scholars have sinced published their own version of this fable. Below, I first provide the English translation, followed by Schleicher's original version, which shows how close PIE reconstruction then still was to Sanskrit. Note, for instance, the absence of *e and *o (> Skt. *a*). Also, Schleicher's version stays close to the syntax of Sanskrit.

The sheep and the horses
(1) A sheep that had no wool saw horses, one of them pulling a heavy wagon, one carrying a big load, and one carrying a man quickly.
(2) The sheep said to the horses: "My heart pains me, seeing a man driving horses".
(3) The horses said: "Listen, sheep, our hearts pain us when we see this: a man, the master, makes the wool of the sheep into a warm garment for himself. And the sheep has no wool".
(4) Having heard this, the sheep fled into the plain.

Avis akvāsas ka

(1) *Avis, jasmin varnā na ā ast, dadarka akvams, tam, vāgham garum vaghantam, tam, bhāram magham, tam, manum āku bharantam.*

(2) *Avis akvabhjams ā vavakat: kard aghnutai mai vidanti manum akvams agantam.*

(3) *Akvāsas ā vavakant: krudhi avai, kard aghnutai vividvant-svas: manus patis varnām avisāms karnauti svabhjam gharmam vastram avibhjams ka varnā na asti.*

(4) *Tat kukruvants avis agram ā bhugat.*

In 2010, Frederik Kortlandt published eight different versions of the fable, starting in the PIE phase (that is, before Anatolian left the PIE homeland), and going via 'Classic Indo-European' and 'Balto-Slavic' to a Lithuanian version. This enables him to show the relative chronology of the linguistic changes reconstructed for earlier phases of BSl. and Indo-European. We here provide the third version, 'Classic Indo-European'. This is the second stage of development of the non-Anatolian languages, and in that sense already somewhat different from what should be called PIE. Still, this version is probably the closest to the forms and symbols used in the present introduction.

(1) *ʕʷeuis ioi ʕuelʔneʕ nēʔs ʔeḱuns ʔe uēi'd, tom 'gʷrʕeum uoǵom ueǵontm, tom m'geʕm borom, tom dǵmenm ʔoʔḱu berontm.*

(2) *ʔe uēuk ʕʷeuis ʔeḱumus, ʕedǵo ʔmoi ḱēr'd ʕnerm ui'denti ʔeḱuns ʕe'ǵontm.*

(3) *ʔe ueukn'd ʔiḱues: ḱludi ʕʷuei, ʕedǵo nsmi ḱēr'd ui'denti, ʕnēr potis ʕʷuiom ʕulʔneʕm subi gʷermom uesti kʷrneuti, ʕʷuimus kʷe ʕulʔneʕ neʔsti.*

(4) *to'd ḱeḱluus ʕʷeuis pleʕnom ʔe bēu'g.*

Notes:

a. 'Horse' is reconstructed as an *u*-stem **ʔeḱu-* on account of Hittite *ekku-* < *ʔeḱu-*.

b. Final cluster simplification has already been applied: *nēʔs* < earlier **nēʔst*, *uēuk* < **uēukt*, *bēu'g* < **bēu'gd*

c. *ʔiḱues* "with reduction of pretonic **e* to **i*"

> **Exercise 66**
>
> Study closely the differences between the 2010 reconstruction and the somewhat more traditional reconstruction taught in this book, and try to explain them. You might focus on:
>
> a. Phonology: the laryngeals, the articulation of the stops.
> b. Morphology: ablaut, nominal endings, verb forms. Try to divide the words into separate morphemes.
> c. Syntax: case agreement, number, gender.
> d. Lexicon: differences between Schleicher's version and Kortlandt's.

Appendix

I.   Key to the exercises

Exercise 1
a. *d, b. *bʰ, c. *p, d. *st_b, e. *d, f. bʰ, g. *st, h. *t, i. *dʰ

Exercise 2
a. *gʷ, b. *g/*ǵ, c. *ḱ, d. *ǵʰ, e. *ḱ, f. *gʷ, g. *ǵʰ, h. *kʷ

Exercise 3
a. *t, b. *bʰ_ǵʰ, c. *dʰ_ǵʰ, d. *dʰt, e. *dʰ_gʰ

Exercise 4
a. *pélk/ḱ-, *plk/ḱ-é-, b. *óiḱ-, *oiḱ-, c. *sont-, *sént-, d. *líp-, *-loip-, e. *wes-, *wés-, f. *ment-, *mént-

Exercise 5
a. *d_t, b. *dʰ, c. *p_d, d. *sgʰ, e. *d_ḱ, f. *gʷ
g. *ḱ_t-, h. *bʰ_s-, c. *-p-

Exercise 6
a. *p, root, b. *gʰ, suffix, c. *g_t, suffix, d. *t, root, e. *dʰ_bʰ, suffix

Exercise 7
a. PIE *d > PGm. *t = E. t; > OHG zz > NHG ss between vowels
b. PIE *t- > PGm. *þ- (Grimm's Law) > E. [ð]-, > NHG d-; PIE *-d > PGm. *-t = E. -t, OHG -z > NHG -s
c. PIE *p > PGm. *b (Verner's Law) > NHG b; > E. v between vowels
d. PIE *ǵ > PGm. *k (> kch in southern HG); PIE *t > PGm. *d (Verner's Law)
e. PIE *d > PGm. *t = E. t; > OHG z-; PIE *ǵʰ > PGm. *g = E. g, NHG ng [ŋ]
f. PIE *ḱ > PGm. *x (Grimm's Law) > E. h-; PIE *s > PGm. *z (Verner's Law) > WGm. *r = E. r

Exercise 8
a. *k_b, b. *d-, c. *st_g, d. *d, e. *d_ḱ

Exercise 9

a. *$tḱ$, b. *$peḱt$-, *$pḱt$-, c. *$dʰgʷʰ$

Exercise 10

a. *$ulkʷ$-, b. *n, c. *s, d. *$-mn$, e. *s, f. *$i\_u\_ḱ$-, g. *i-, h. *s_n, i. *u-, j. $prḱ$-, k. *$-dʰr$, l. *$mntis$

Exercise 11

a. *$gʷem$-, b. *$gʰost$-, c. *h_1e-, d. *$nokʷ$-, e. *ued^h-, f. *$-ōr$, g. *$roud^h$-, h. *$moin$-, i. *o, j. *$ē$, k. *$-ōi$, l. *o

Exercise 12

a. *eu : *u, b. *o vs. *e or zero, c. *oi vs. *i, d. *on vs. *n

Exercise 13

a. *$ḱHt$-, b. *h_2ner-, c. *$h_1regʷ$-, d. *h_1lng^h-, e. *h_3est-, f. *$th_2ǵ$-, g. *h_2e_i-, h. *$ḱh_2p$-, i. *$spHoi$- (or *sph_3ei-), j. *keh_2ulo-, k. *$Horǵ^hi$-, l. *$uiHro$-

Exercise 14

a. *seh_1- (*sh_1-), b. *peh_2- (*ph_2-), c. *peh_3- (*ph_3-)

Exercise 15

a. *$gʷrHtos$, b. *h_2enti, c. *ueh_1ntos, d. *$ḱrHs$-, e. *b^hreh_2ter-, f. *$mrǵ^hu$-, g. *smh_2elis

Exercise 16

a. *h_3nob^h- vs. *h_3nb^h-, b. *leh_1d- vs. *lh_1d-, c. *$domh_2$- vs. *$ndmh_2tos$

Exercise 17

a. *tep-, b. *$ḱokʷr$-, c. *$ǵomb^ho$-, d. *h_2eug-, e. *$b^heh_2ǵ^h$-, f. *b^her-, g. *$gʷōm$, h. *$perd$-, i. *$seh_2ǵ$-, j. *b^hend^h-, k. *$gʷʰen$-, l. *d^hroug^h-, m. *$h_1eḱuo$-, n. *$gʰost$-, o. *$tḱiti$-, p. *trp-

Exercise 18

a. *$derk$-, *$dorḱ$, *$drḱ$-, *$dorḱ$-
b. *b^heid-, *b^hid-, *b^hoid-, *b^he/oid-
c. *b^hud-, *b^houd-, *b^heud-, *b^hud-, *b^heud-, *b^hud-
d. *$drem$-, *drm-, *$drom$-
e. *$h_3reǵ$-, *$h_3roǵ$-, *$h_3rǵ$-, *$h_3rǵ$-, *$h_3reǵ$-
f. *h_2ueh_1-, *h_2ueh_1-, *h_2uh_1-
g. *$ḱeuH$-, *$ḱuH$-, *$ḱuH$-
h. *$terh_1$-, *trh_1-, *$torh_1$-
i. *h_3ng^h-, *h_3nog^h-, *h_3nog^h-

Exercise 19

a. *$mntos$, b. *$septm$, c. *$mrti$-, d. *h_2eies-, e. *h_3orb^h-, f. *$ḱlounis$

Exercise 20

a. Gr. *plēthús*, b. *pothéō*, c. *teúkhō*, d. *télson*, e. *élaphos*, f. *omeíkhō*

Exercise 21

a. *mánas*, b. *cakrá-*, c. *bhāraya*, d. *dhūmásya*, e. *aśīrta-*, f. *buddha-*, g. *ririhuṣī-*

Exercise 22

a. *qumþs* 'coming', b. *filu* 'much, many', c. *leihwan* 'to lend', d. *kalds* 'cold'.

Exercise 23

a. Gr. *néphos*, Av. *nabō* (*nabah-*), b. Skt. *júṣṭis*, Goth. *kusts*, c. Lat. **prāmo-* (attested in *prandium* 'lunch'), Lith. *pìrmas*, d. Lat. *trūd-*, Goth. *þraut-*, OCS *trud-*

Exercise 24

a. **mer-*, b. **tues-*, e. **h₃reǵ-*, f. **bleu-*, j. **sieh₁-*

Exercise 25

a. **tokʼ-*, b. **leis-*, c. **prk-*, d. **h₁os-*, e. **stiǵʰ-*, f. **dʰēu-*, g. **tent-*, h. **suōp-*, i. **streiH-*

Exercise 26

a. **h₂éb-*: stressed *e*-grade; **-ōl*: zero grade **-l* in phase 1, unstressed **-ol* in phase 2, then lengthening before word-final resonant.

b. **uéd-*: stressed *e*-grade; **-ōr*: zero grade **-r* in phase 1, unstressed **-or* in phase 2, then lengthening before word-final resonant; **-én-*: stressed *e*-grade.

c. **h₂nḗr*: stressed *e*-grade, then lengthening before word-final resonant.

d. *pod-*: zero grade **-pd* in phase 1, unstressed **-pod-* in phase 2.

e. **nébʰ-*: stressed *e*-grade; **-os*: zero grade **-s* in phase 1, unstressed **-os* in phase 2; **nebʰ-*: zero grade **nbʰ-* in phase 1, introduction of unstressed *e*-grade in phase 3; **-és-*: stressed *e*-grade; **-os*: zero grade **-s* in phase 1, unstressed **-os* in phase 2.

Exercise 27

Primary suffixes are added directly to the root; secondary suffixes are added to the stems of existing words.

Exercise 28

a. dvandva, b. determinative, c. possessive, d. governing, e. governing, f. possessive

Exercise 29

a. acc.sg., b. loc.pl., c. nom.sg., d. acc.pl., e. nom.sg., f. ins.pl., g. dat./loc.sg., h. gen.abl. sg., i. gen.pl., j. nom.pl.

Exercise 30

a. **-i*, b. **-(o)s*, c. **-om*, d. **-i*, e. **-Ø/*-s*, f. *-Ø*, g. **-bʰi*, h. **-ns*, i. **-(e)h₁*, j. **-i*, k. **-su*, l. **-Ø*, m. **-(e)i*, n. **-mus*

Exercise 31

a. PD, b. static, c. PD, d. HD, e. HD

Exercise 32

a. PD. Prototype: nom.acc. *$\acute{g}$én-s*, gen. *$\acute{g}$n-és-s*

b. PD. Prototype: nom. *séuH-nu*, acc. *séuH-nu-m*, gen. *suH-néu-s*

c. HD. Prototype: nom. *$h_2$éus-s*, acc. *$h_2$us-és-m*, gen. *$h_2$us-s-ós*

d. HD. Prototype: nom. *dér-u*, acc. *dér-u* (neuter), gen. *dér-u-s*

Exercise 33

a. zero grade in the root, full grade in the suffix in the nom.sg, final accent. PIE *urh_1-én*, *urh_1-n-ós*.

b. zero grade in root and suffix but full grade in the ending of the ins.sg. PIE *b^hiH-s-éh₁*.

c. full grade in the root in nom.sg, zero grade of root and suffix in the ending. PIE *$h_1$ér-h_2-(+ -as)*, *h_1r-h_2-ós*.

d. zero grade in the root and full grade in the suffix in the nom.sg., full grade in the suffix in the acc.sg. PIE *h_2s-tér* (+ -za), *h_2s-tér-m*.

Exercise 34

a. nom.sg. *$\underset{.}{u}lH$-ont(s)*, gen.sg. *$\underset{.}{u}lH$-nt-ós*.

b. *wl- > l-*.

c. We find the zero grade *ulH-* of the root instead of the full grade *uélH-*.

d. Apparently, the expected form PIE *uélH-(o)nt-* was preserved in this compound.

e. Gaul. *vlatos* < *wlātós*, OIr. *flaith* < *wlātís*, with Proto-Celtic *wlā-* < PIE *ulH-* before *-tó-*, *-tí-*.

Exercise 35

a. nom.sg. *g^wén-h_2-s*, acc.sg. *g^wén-h_2-m*, gen.sg. *g^wn-éh₂-s*

b. The phonetic changes made the different case forms too dissimilar to keep them within one paradigm. The normal-type forms have been created by analogy: *jány-us* by inflecting *jánis* as a real *i*-stem, *gná̅* en *gná̅m* by interpreting the gen.sg. *gnás* as an *ā*-stem.

Exercise 36

ues-r/n-. nom. *ués-r*, gen. *us-én-s*.

Exercise 37

a. *-u-ós*, b. *-u-ós*, c. *-i-éi*, d. *-u-ós*, e. *-u-éi*, f. *-u-ós*, g. *-i-ós*, h. *-ēu-m* (for *-eu-m*).

Exercise 38

a. HD (*-u-éh$_1$), b. PD (*-ou-s), c. HD (*-ou-m or a long vowel), d. PD (*-ou-s), e. HD (*-u-éi), f. HD (*-u-ós)

Exercise 39

a. *h$_2$ér-mn-su, b. *sup-s-éi, c. *ḱlu-és-om, d. *sok^{w}H-éi-ns, e. *Hroth$_2$-iH-ós, f. *h$_1$i-nt-iéh$_2$-s, g. *h$_1$ésh$_2$-r, *h$_1$sh$_2$-én-s, h. b^{h}réh$_2$-tr-s. Analogical remakes have subsequently influenced the outcome of each of the given forms.

Exercise 40

a. *suH-, b. *speḱ-, c. *uid-, d. *klōp-. All are root nouns.

Exercise 41

a. *suHnéues *uh$_2$th$_1$ós
b. *ǵ^{h}imí (or *ǵ^{h}iẽm) *h$_1$édmn *ḱunmus
c. *dérub^{h}i *g^{w}lh$_2$nóm
d. *b^{h}orm *h$_2$iésh$_1$
e. *kéh$_2$uōs *ik^{w}éns

Exercise 42

a. nom.gen.sg. *ǵomb^h-o-, b. loc.sg. *urǵ-o-, c. loc.pl. *sup-no-, d. acc.pl. *porḱ-o-, e. acc.sg. / nom.acc.sg.n. *uoǵ^h-nelo-, f. abl.sg. *uiH-ro-, g. ins.pl. *h$_1$rud^h-ro-, h. ins. sg. *peh$_3$-tlo-.

Exercise 43

a. *uiHrōi *pertstlos
b. *uoǵ^{h}oi *suepnom
c. *ḱuitnōs *h$_2$rtḱōs
d. *ulk^{w}om *porḱōis

Exercise 44

a. *h$_1$méh$_2$i, b. *g^{w}rh$_2$-u-ih$_2$-m, c. *med^{h}ioi, d. *d^{h}rug^h-unt-ih$_2$

Exercise 45

a. PIE *sén-iōs, b. *prHmons, c. *ḱuk$^{(w)}$-i, d. *plH-u-ih$_2$, e. *m(e)ǵiéses

Exercise 46

a. Goth. *filu* < PIE *pélH-u, Gr. *polús* < *polH-u-s, Skt. *purú* < *plH-u.
b. PIE *plH-nó-s (Gr. and Latin *plēnus* show that the *H here is *h$_1$)

Exercise 47

a. *sn-is-éi *h$_2$n-r-éi
b. *pt-n-unt-b^{h}i *uek^w-(o)s-b^{h}i
c. *mǵ-éh$_2$-m *ḱu-n-ih$_2$-m

Exercise 48

a. (1) There is no distinction between m. and f. gender. (2) There is ablaut between *e
and *i, which is unknown outside a few pronouns. It seems obvious that *k^wo- is
also related but the origin of the different vowel is unclear. (3) The case endings
are the pronominal endings also found in *h_1e, *im, which appear to be post-PIE
additions outside the nom.acc.

b. Lat. *tunc* < *tom-ke is acc.sg. of the dem. *so, *to- plus deictic *$\acute{k}e$ (see 17.3) The acc.
often indicates a limited amount of time.

Lat. *sīc* < *$seike$ contains an old pronominal ins.sg., maybe *h_1ei plus the *s- of *so,
*to-.

Lat. *topper* < *tod-per contains the nom.acc.sg. *tod 'that' plus the Latin particle *-*per*
which refers to frequency or duration (< PIE *$peri$, see 17.1.5).

Lat. *citrō* < *ki-$terōd$ is the abl.sg. of a stem *ki-$tero$-, with the adjectival suffix *-$tero$- of
binary contrast (14.4) added to the particle *$\acute{k}i$, which, in some branches of IE,
became an inflected deictic pronoun.

U. *esmik* < *$esmike$ contains the loc.sg. *$h_1\acute{e}smi$ of the pronoun *h_1e, plus deictic *$\acute{k}e$.

c. The acc.sg. *im.

Exercise 49

a. *id-id + *-$\acute{k}e$, b. *$sā$-pe-$sā$, that is, twice the f. *seh_2- with the particle *pe, c. PIE *si-
h_2sih_2, d. Twice PIE *so plus the particle *de.

Exercise 50

a. By means of the (enclitic) gen.sg. of the personal pronoun (*h_1moi), b. By means of
the possessive adjective (*h_1mo-).

Exercise 51

kas < *k^wos, *ka* < *k^wod, *quai* < *k^weh_2-i, *kasmu* < *$k^wosmōi$, *kan* < *k^wom; *toū* < *tuH,
ioūs < *iuH-s.

Exercise 52

These forms contain in their first member the nom. of the pronoun m. *h_1e, f. *ih_2
(provided with f. *-$ā$ in the feminine; the exact preform of the m. is uncertain) and
the acc.sg. of the pronoun *so-/*to-. It therefore seems likely that both PIE pronouns
had merged into one paradigm in Proto-Albanian. The second member probably con-
sisted of an uninflected form indicating the possessor, maybe the enclitic genitives
(*moi, *toi, *nos, *wos) or the accusative (*me, *$t(w)e$).

Exercise 53

a. *tri* (m.), *teir* (f.): PIE nom. masc. *$treies$, fem. *$tisres$. The *-s- has disappeared in
teir but has left its trace in the *i* of -*eir*. For 'four', we have PIE masc. *$k^w\acute{e}tuores$

> *pedwar* (*p* reflecting the labiovelar, and *dw* < *tw), whereas *pedeir* must reflect fem. *kʷetursres > *kʷetusres with *-sr-* yielding *-ir-* as in 'three'.

b. *naontek* '19', *pemp* '5', *dek* '10', *pevar* '4' (m.), *trizek* '13', *ugent* '20'

c. *trios *h₂nḗr; *potnih₂m *duis; *duoih₁ *h₃néh₃mnih₁ (nom.acc.du.); **Hoi(H)noei* *prHuom *nmrtom

Exercise 54

a. **speḱ-ie-* them. 1pl. prim.

b. **bʰeh₂-* root pres. athem. 3sg. prim.

c. **si-sh₁-* red. pres. athem. +augment 3pl. sec. (= imperfect)

d. **mon-eie-* caus. pres. them. 2sg. prim.

e. **kh₂p-s-* s-pres. athem. 2pl. prim.

f. **li-n-kʷ-* nasal pres. to root **likʷ-* athem. +augment 1sg. sec. (= imperfect)

g. **umh₁-* root pres. athem. 3pl. prim.

h. **ǵnh₃-ske-* sk-pres. them. 2pl. sec.

i. **di-dh₃-* red. pres. athem. 1pl. prim.

j. **uer-urǵ-ie-* intensive *ie*-pres. them. 3pl. sec.

Exercise 55

a. *h₁é-uoǵʰ-eie, b. *klnh₂-énti, c. *likʷ-és-si, d. *gʷm-ie-te

Exercise 56

a. present or aorist, b. present, c. present, d. aorist, e. present, f. present or aorist, g. present, h. present, i. present, j. perfect, k. present

Exercise 57

a. **le-lois-* / **le-lis-*, b. **ǵnēh₃-s-* / **ǵneh₃-s-*, c. **ie-ies-* / **ie-is-*, d. **ḱl-ne-u-* / **ḱl-n-u-*, e. **dḱ-es-* / **dḱ-s-*, f. **h₂melǵ-* / **h₂mlǵ-*, g. **h₂mord-eie-*, h. **bʰeudʰ-* / **bʰudʰ-*, i. **uers-e-*.

Exercise 58

*h₁éḱleit, *ḱléio, *ḱekloie

Exercise 59

a. act. (**-onti*), b. mid. (**-medʰh₂+i*), c. mid. (**-to*), d. intr.mid. (**-o+i*), e. act. (**-ti*), f. mid. (**-dʰue+i*)

Exercise 60

a. indicative, b. imperative, c. subjunctive, d. optative, e. indicative, f. injunctive, g. optative, h. subjunctive, imperative, indicative

Exercise 61

a. *h₁étengst, b. *plnéh₂m, c. *poréioih₁te, d. *ḱluént, e. *h₂uéh₁e, f. *didḱiéh₁t, g. *dmnéh₂tu, h. *léǵʰo, i. *sékʷontro, j. *dʰedʰorsth₂e, k. *uidr or *uidḗr, l. *didh₃ué

Exercise 62

a. *b^hindénti*, b. *k^wérti*, c. *duistó*, d. *d^horéioih$_1$s*, e. *$h_1$siéh$_1$s*, f. *$h_1$ésteh$_2$m*, g. *uéuoiƙe*

Exercise 63

a. *sérpont-*, b. *déuksnt-*, c. *k^weit-uos-, -us-*, d. *k^wérnt- / *k^wrént-*, e. *punHént-*, f. *steguos-, -us-*

Exercise 64

a. *lud^htó-*, b. *kHluomh$_1$no-* (>> *-io-*), c. *$h_1$dnó-* (>> IIr. *Had-*), d. *ntrsto-*, e. *plƙéno-*

Exercise 65

A. *g^wmskóH*, *g^wmskéh$_1$i*, *g^wmské*, *g^wmskómom*, *g^wmskéth$_1$e*, *g^wmskó*; B./F. *g^wé-moH*, *g^wémeh$_1$i*, *g^wéme*, *g^wémomom*, *g^wémeth$_1$e*, *g^wémo*; C. *g^wmskóih$_1$m*, *g^wmskóih$_1$s*, *g^wmskóih$_1$t*, *g^wmskóih$_1$me*, *g^wmskóih$_1$te*, *g^wmskóih$_1$ent*; D. *g^wm-skésue*, *g^wmskéd^{h}ue*; E. *$h_1$ég^{w}emm*, *$h_1$ég^{w}ems*, *$h_1$ég^{w}emt*, *$h_1$ég^{w}mme*, *$h_1$ég^{w}mte*, *$h_1$ég^{w}mnt*; G. *g^wég^{w}omh$_2$e*, *g^wég^{w}omth$_2$e*, *g^wég^{w}ome*, *g^weg^{w}mmé*, *g^weg^{w}m(h_1)é*, *g^wég^{w}mr*.

Main analogical changes: A: addition of athematic endings in 1–3sg. and 3pl., generalization of *cch* < *ske*, accent retraction. B: creation of a new subjunctive on the basis of the *sk*-present, IIr. *gask-a-aH*, *gask-a-as*, etc. C: generalization of *cch*, replacement of 3pl. *-nt* by *-rs* > *-ur*. E: replacement of *j-* < *g^we-* by *g-* in the sg.; F: Replacement of *j-* by *g-* in all forms, introduction of athematic endings.

Exercise 66

a. Phonology: the laryngeals are rendered not with the symbols h_1, h_2, h_3, but with the phonetic symbols for their putative pronunciation, ʔ, ʕ and ʕʷ. The traditional triad *t*, *d*, *d^h* is here rendered by *t*, *ʼd*, *d*, the second consonant indicating a glottalized stop.

b./c. Morphology: the ablaut largely sticks to the most original versions of static, PD and HD nominal paradigms. Only one *e*-grade per word is allowed. *e*-grade in monosyllables is rendered as *ē*. Here is the text with separated morphemes and grammatical glosses:

(1) ʕʷeu.i-s   io-i   ʕuel.ʔn.eʕ   nē-ʔs   ʔeƙ.u-ns   ʔe
sheep-NOM.SG REL.DAT wool-NOM.SG NEG-be-3SG.INJ horse-ACC.PL then

uēiʼd   tom   ʻgʷrʕ.eu-m   uoǵ.o-m   ueǵ-ont-m
see-3SG.AOR DEM.ACC.SG.M heavy-ACC.SG wagon-ACC.SG convey-PTC-ACC.SG

tom   mʼg.eʕ-m   bor.o-m
DEM.ACC.SG.M big-ACC.SG load-ACC.SG

tom   dǵm.en-m   ʔo.ʔƙ.u   ber-ont-m
DEM.ACC.SG.M man-ACC.SG fast-ACC.SG.N carry-PTC-ACC.SG

(2) *ʔe   uē-uk   ʕʷeu.i-s   ʔeḱ.u-mus*
then RED.say-3SG.PRES sheep-NOM.SG horse-DAT.PL

ʕedǵ-o   ʔm-oi   ḱēr'd   ʕner-m   ui'd-ent-i
pain-3SG.INTR.MID me-DAT heart-NOM.SG man-ACC.SG see-PTC-DAT.SG

ʔeḱ.u-ns   ʕe'ǵ-ont-m
horse.ACC.PL lead-PTC-ACC.SG

(3) *ʔe   ue-uk-n'd   ʔiḰ.u-es   ḱlu-di   ʕʷu.ei*
then RED.say-3PL.PRES horse-NOM.PL listen-IMP.2SG sheep-VOC.SG

ʕedǵ-o   ns-mi   ḱēr'd   ui'd-ent-i
pain-3SG.INTR.MID us-DAT heart-NOM.SG see-PTC-DAT.SG

ʕnēr   pot.i-s   ʕʷu.i-om   ʕul.ʔn.eʕ-m   su-bi
man-NOM.SG master-NOM.SG sheep-GEN.PL wool-ACC.SG self-DAT

gʷer.mo-m   ues.ti   kʷr.ne.u-ti
warm-ACC.SG garment-ACC.SG make-3SG.PRES.IND

ʕʷu.i-mus-kʷe   ʕul.ʔn.eʕ   ne-ʔs-ti
sheep-DAT.PL-and wool-NOM.SG NEG-be-3SG.PRES.IND

(4) *to'd   ḱe-ḱlu-us   ʕʷeu.i-s   pleʕ.no-m   ʔe*
DEM.ACC.SG.N RED.hear-PF.PTC.NOM.SG sheep-NOM.SG plain-ACC.SG then

bēu'g
flee-AOR.3SG

II. Phonetics

Here is a short survey of the classification of the more frequent sounds, and a list of phonetic symbols. See also the list of terms.

1. Symbols

C consonant
C: long (geminated) consonant
Cʷ labialized consonant (also *C°*)
Cʸ palatalized consonant (also C´)
Cʰ aspirated consonant
C' glottalized, ejective consonant
C̃ nasalized consonant
R̥ In IE: vocalic sonant (NB in phonetics this sign indicates a voiceless sound)

R̥ consonantal glide
V vowel
V̆ short vowel
V̄, V: long vowel
Ṽ, V̧ nasalized vowel
Ø zero
/ / phonological
[ ] phonetic
{ } orthographic

2. Vowels

The vowel and consonants signs of the world's languages have been established in the *International Phonetic Alphabet* (*IPA*). See www.langsci.ucl.ac.uk/ipa/index.html for their pronunciation. A summary of the main sounds relevant to Indo-European is given in the tables below. In the present study, more traditional and/or more frequently used signs than in *IPA* are sometimes employed; these are given after the slash.

On the basis of the position of (the highest point of) the tongue the vowels can be grouped roughly in a triangle (*i – u – a*); compare Section 4.9.

(1 = unrounded; 2 = rounded)

	front		central	back	
	1	2	1	1	2
high	*i*	*y/ü*	*ɨ*	*ɯ/ï*	*u*
–	*I*				*ʊ*
middle high	*e*	*ø/ö*		*ɣ/ë*	*o*
–			*ə*		
middle low	*ɛ*	*œ/ɔ̈*		*ʌ/ë*	*ɔ*
low	*æ*		*a*	*a*	*ɒ*

3. Consonants

See also the illustration on the next page. After the comma the voiced form is given.

	1	2	3	4	5a	5b	6	7	8	9	10
	bi-labial	labio-dental	dental	alveo-lar	retro-flex	pala-to-al-veolar	palatal	velar	uvular	pha-ryn-geal	laryn-geal
stop	p, b		t, d		ʈ, ɖ		c, ɟ	k, g	q, G		ʔ
affricate		pf	ts, dz		tʃ, dʒ			kx			
fricative	ɸ, β	f, v	θ, ð	s, z	ʂ, ʐ	ʃ, ʒ	ç, j	x, ɣ	χ, ʁ	ħ, ʕ	h, ɦ
nasal	m		n		ɳ		ɲ	ŋ			
lateral			l		ɭ		ʎ				
lateral fric.			ɬ, ɮ								
trill / tap			r / ɾ		– / ɽ				ʀ / –		
approximant		ʋ	ɹ		ɻ		j	ɰ			

The sounds 3–8 are made with the tongue against the place of articulation as indicated. Many of these consonants can have secondary articulations; the most frequent are:

labialized, C^w: k^w, g^w
aspirated, C^h: p^h, b^h
nasalized, $\tilde{C}$: $\tilde{\beta}$
glottalized, C': t'
velarized, C^γ: ɫ, a 'thick' *l*, nearly as in E. *wall*
palatalized, C': *t*', *s*', *š*', *č*', *l*', *u̯*'

Alternative / more traditional consonant notations:

ṭ, ḍ = ʈ, ɖ   x́, γ = ç, j
ḱ, ǵ = c, ɟ   ṇ = ŋ
tš, dž = tʃ, dʒ   ñ = ɲ
ṣ, ẓ = ʂ, ʐ   ḷ = ɭ
š, ž = ʃ, ʒ   w = ʋ
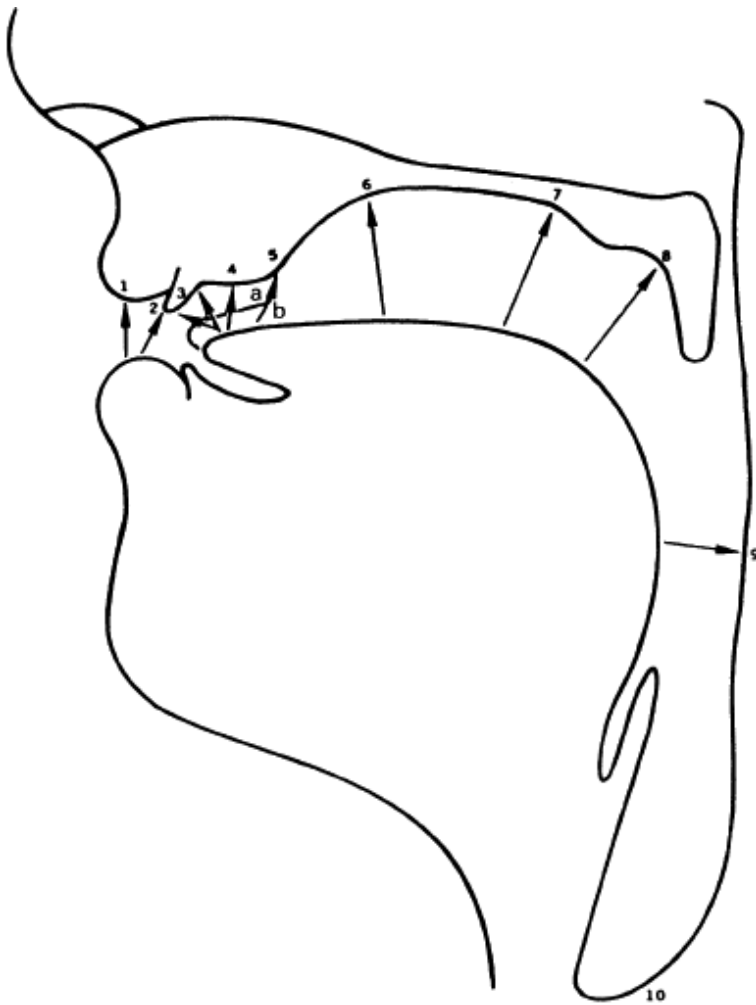
1. bilabial
2. labiodental
3. dental and interdental
4. alveolar
5. postalveolar
 a. retroflex
 b. palato-alveolar
6. palatal
7. velar
8. uvular
9. pharyngal
10. glottal

III. List of Terms

(Words preceded by ° are also defined in this list.)

Ablative, case indicating origin.

Ablaut, from G. *Abstufung der Laute* 'gradation of sounds'. Vowel gradation, alternation of vowels as in E. *find, found*, (Fr. apophonie). In PIE ablaut a distinction is made between full grade (with the vowel *e* or *o*, e.g. *-ter*, *-tor-*), zero grade (without a vowel: *-tr-*) and the lengthened grade (with long vowel *ē* or *ō*: *-tēr*, *-tōr-*).

Absolutive, case in ergative languages used to indicate the subject of intransitive, and the object of transitive verbs.

Accusative, case used to indicate the direct object.

Acrostatic, see °static.

Acute, an accent indicating rising tone; circumflex indicates a rising-falling tone. (Sometimes these terms are used historically and the intonation is, in fact, different, e.g. in Lithuanian.)

Adstratum, a language in contact with another, which may influence this language; it is not a °substratum or a °superstratum.

Adverb, a word used to qualify a verb, adjective or other adverb.

Affix, a bound morpheme, i. e. a °morpheme not appearing independently. One can distinguish between prefix (*be-* in *beloved*), infix (the *n* in Lat. *vi-n-c-ō* beside *victus*) and suffix (*-ing* in *danc-ing*).

Affricate, a consonant which begins as a stop and ends as a (homorganic) fricative, as *pf* in G. *Pferd.*

Allomorph, a variant of a °morpheme. In Lat. *hon-ōs, hon-ōr-is, -ōs-* and *ōr-* are allomorphs.

Allophone, one of the phonetic variants of a °phoneme. For instance, the different *t*-sounds in *tea, stop, past* are allophones of each other. See °combinatory variant.

Alveolar, pronounced by placing the tongue against the gum of the upper teeth (alveolar ridge), as in *t, s, l.*

Anaphoric, referring back to another word already mentioned.

Anaptyxis, the development of a vowel between two consonants, for instance Lat. *periculum* from the older *periclum*. See °svarabhakti.

Aniṭ, a Sanskrit root not ending in *-i* (< laryngeal), and also a PIE root not ending in a laryngeal. Compare °seṭ.

Anlaut, (at) the beginning of a word. Compare °auslaut and °inlaut.

Anudātta, see °*udātta.*

Aorist, a °tense of the Greek verb.

Aphaeresis, the removal of an initial vowel; e.g. *'rithmatic* for *arithmatic*, or *bishop* from Gr. *epískopos.*

Apical, see °coronal.

Apocope, the loss of a short final vowel, mostly in absolute final position.

Approximant, a sound produced when the speech organs (lips, tongue etc.) come close but barely touch (allowing the air to flow easily).

Archiphoneme, is assumed where the difference between two or more phonemes has been neutralized, for instance *N* for Latin *n* and *m* before *b*, as in *imberbis* 'beardless' from *in-* and *barba* (where an *m* was always spoken); it is then written as *iNberbis.*

Aspect, the expression of the course of an action (in verb forms)

Aspiration, the articulation of a consonant with a *h*-like offglide; for example, Greek *theós* with t^h.

Assibilation, the development of a palatal or palatalized consonant into a °sibilant or (a cluster or) an °affricate with a *s*-sound as second element; e.g. PIE *ḱmtom > Skt. *śatám*, Av. *satəm*; Lat. *centum* > Ital. *cento* [č-].

Assimilation, the influence which two sounds have on each other, and by which their features become more similar or the same; see °progressive and °regressive assimilation.

Asyndeton, two or more parts of speech with the same syntactical function juxtaposed without connective; e.g. the famous saying *veni, vidi, vici.*

Athematic, see °thematic.

Attributive, adjunct with a substantive, such as the adjective in *the big house*, or the genitive (*of the neighbour*) in *the house of the neighbour.*

Augment, verbal prefix (PIE *h_1e-, Gr. *e-*) indicating a past tense.

Auslaut, (at) the end of a word.

Auxiliary, a verb giving extra semantic or syntactic information about the main verb which it accompanies, e.g. *has* and *will* in E. *he has done, he will go.*

Back vowel, a vowel formed by raising the back part of the tongue, e.g. *a, o, u.* The opposite is a °front vowel.

Bahuvrihi, (literally '(having) much rice'), a possessive compound, stating what the referent of the compound 'has'; for instance *redskin* 'someone who has a red skin' (not: 'who is a red skin').

Barytonon, word with non-final stress; see oxytonon.

Bilabial, sound produced by placing the upper and lower lip against one another or close together, as in *p, m.*

Bilingue, a text in two languages, one of which is an almost exact translation of the other.

Breaking, diphthongization of a vowel before a consonant (or a vowel) in the next syllable; e.g. *a* > *ea* before *r, l* + consonant in Old English: *ceald* 'cold', cf. G. *kalt.*

Case, in inflectional languages: the form of a noun, pronoun or adjective indicating its relationship to other words in a sentence.

Cataphoric, referring to a constituent which has yet to come.

Causative, verb indicating that an action results in another action, for instance to *fell* is 'to cause something to fall'.

Centum languages, languages where the PIE palatals (*$\acute{k}$ etc.) are continued as velars, e.g. *$\acute{k}mtom$ > Lat. *centum*. If the palatal stop is °assibilated, the language is called a satem language.

Circumflex, see °acute.

Collective, a noun indicating a plurality as a unity, e.g. G. *Gebrüder* 'brothers', Welsh *llygod* 'mice'. The opposite is a singulative, with which one can derive a single entity from a collective: W. *llygoden* 'mouse'.

Combinatory variant, a variant of a °phoneme determined by the surrounding sounds. For example the *ch* in G. *mich* is, under the influence of the preceding sound, pronounced differently (viz. more palatalized) to the *ch* in *noch*. See °allophone.

Compensatory lengthening, the lengthening of a vowel which accompanies the loss of a following consonant, as in Lat. *fānum* < *fasnom*.

Complementary distribution, two sounds are in complementary distribution when they never occur in the same position. For instance the [*ph*] in English *pin* and the [*p*] in *spin*: the unaspirated sound can only occur after *s*, whereas the aspirated sound is not possible in this position.

Concord, (G. Kongruenz), agreement of two words in grammatical category like number, person etc.

Conjugation, inflexion of verbs according to tense, person and number.

Conjunction, a word used to link together words or parts of a sentence.

Continuant, a speech sound in which the air stream is not completely obstructed so that the sound can be continued for some time, as *l, m, s*.

Copula, (especially) the verb 'to be' when used to link subject and predicate; e.g. *he is an officer*.

Coronal, a sound formed by the tip of the tongue, as *t, d, s, z, n, l, r*. Also: °apical (apex = tip of the tongue). Cf. °laminal.

Dative, case form usually used to indicate the recipient of the action.

Declension, inflexion of nouns, pronouns and adjectives.

Deictic, indicating or specifying place, time etc. For example *here, this, then*.

Dental, a speech sound produced by a closure or stricture in the area of teeth, as in *t*, and *n*.

Deponent, a verb with only passive (or middle) forms, with active (at least non-passive) meaning; e.g. Lat. *loquī* 'to speak'.

Derivative, a word derived from another word, e.g. *manhood* from *man, teacher* from *teach*.

Diachronic, pertaining to changes over a period of time. E.g. diachronic linguistics; as opposed to synchronic, which pertains to a single point in time.

Diphthong, a combination of two vowels in one syllable, for example *[oi]* in *boy*.

Diminutive, a form of a word indicating a slight degree or the smallness of the referent.

Dissimilation, the differentiation of two identical or similar sounds. For instance E. *turtle* from Lat. *turtur*.

Distinctive features, phonetic features which determine the difference between phonemes. For example, *t* and *d* differ because the latter is voiced and the first is not.

Disyllabic roots, in PIE: roots ending in a consonant + a laryngeal; the laryngeal later often became a vowel, as in *perh₂- > Gr. *pera*-. See °seṭ.

Dorsal, see °velar.

Elision, the loss of a short vowel (seldom a diphtong) at the end of a word before the initial vowel of the following word. For instance Gr. *ep' emoi* for *epí*, *boúlom' egṓ* for *boúlomai*.

Enclitic, words so closely connected with the adjacent word that together they form an (accentual) unit. For instance Gr. *theós tis* 'one god or another'. See °proclitic.

Endocentric, a compound in which the referent is identical to the first or second part of the compound; for example, *gun-boat* is a kind of boat.

Epenthesis, is the development of sounds, for phonetic reasons, in the transition between two other sounds, i.e. *str-* < **sr-* in *stream*.

Ergative, is the case used in some languages to mark the agent of a transitive verb, (as opposed to the subject of an intransitive verb which is mostly in the absolutive case).

Exocentric, a compound in which the referent is not identical with one of the two members of the compound, but lies outside the compound itself; see °bahuvrīhi.

Flap, a sound produced by quickly blocking the air stream once. The retroflex *r* can be produced in this way.

Flexion, see °inflexion.

Fortis, sounds produced by a powerful airstream; the opposite is lenis.

Fricative, (also: spirant), a rasping or hissing sound produced by narrowing the airstream as in *f*, *χ* (as *ch* in Scots *loch*), *s*.

Front vowel, a vowel made by raising the front part of the tongue, such as *i* and *e*; see °back vowel

Full grade, see °ablaut.

Geminate, a consonant which is distinctively longer than a simple consonant, e.g. [*t:*]. The word *geminate* refers to the usual rendering in writing by a double sign, e.g. <*tt*>.

Genitive, case indicating possession and origin; for instance Lat. *senātūs* (gen.) *consultum* 'senate's decision'.

Gerund, a verbal noun; e.g. Lat. *modus vivendī* (ger.) 'way of living'.

Gerundive, a passive verbal adjective indicating necessity ('which must be…'), e.g. *triumviri rei publicae constituendae* 'three men for the state which must be (re) organised', i.e. 'to reorganise the state'.

Glide, an approximant, such as *y*, *w*. Also: sound developing as a transition from one sound to the other, (often) not phonemes, such as the [j] in E. *European* between *e* and *a*. Whether or not such a sound is a phoneme depends on the language.

Gloss, explanation of a word in another language.

Glottalised, a sound spoken with an explosion of air due to the suddenly opening vocal cords. This explosion (glottal stop) can be heard in careful speech before an initial vowel, e.g. *a-* in *the alien*; in G. it occurs before every word-initial vowel.

Glottochronology, a theory postulating that words in the lexicon are replaced by different words at a constant pace throughout (pre)history. Using percentages of similarity and disparity in the lexicon, one would be able to determine how long ago related languages separated. The theory is incorrect.

Guṇa, in Sanskrit this is a grammatical term for the full grade (PIE vowel **e* or **o*). See °ablaut.

Guttural, see °velar.

Haplology, the omission of a syllable which is (almost) identical to the following, e.g. Gr. *amphoreús* from Myc. */amphiphoreus/*.

Heteroclitic, a noun with two different stems, like Gr. *húdōr* 'water' (*r*-stem), gen. *húdat-os* (*t*-stem).

High, said of vowels produced with the mouth in a (more) closed position, for instance *i*, *u*. Low vowels are made with the mouth more open, for instance *a*.

Homorganic, sounds produced by the same speech organs, e.g. *t*, *n*, *l*, *r*.

Hysterodynamic, an inflectional class, assumed for PIE, with the stress (more) to the end of the word, as in Greek *patḗr*, *patéra*, *patrós*. The opposite is called proterodynamic, as in Goth. *sunus*, gen. *sunaus*. See Section 13.2.4.

Imperative, mood indicating a command.

Inchoative, verb indicating a beginning.

Indicative, mood which states an action as a fact.

Infix, see °affix.

Inflexion, °declension and °conjugation.

Injunctive, mood which mentions an action as outside time.

Inlaut, in (the middle of) the word, i..e. not at the beginning or end of a word. See °anlaut and °auslaut.

Instrumental, a case indicating the instrument with which an action is carried out.

Innovation, a new development.

Isogloss, a line indicating the limit of the spread of a word or sound. Isomorph is such a line for morphological phenomena.

Iterative, verb describing a repetitive action.

Jer, in Slavic, the very short vowels ъ and ь, originating from PIE *i* and *u*. They often disappeared later, but they could also become full vowels.

Labial, produced by the lips.

Labio-dental, sounds whereby the lower lip is placed against the upper teeth as in *f*.

Laminal, a sound produced by the blade of the tongue (lamina). See °coronal.

Laryngeal, a sound produced in the larynx.

Lateral, a sound whereby the air escapes sideways as in *l*.

Lax, see °tense.

Lenis, see °fortis.

Lenition, a process in which consonants are spoken as lenis, or in some other way are less powerfully produced. In this way a *t* can become a *d* or a ϑ.

Lexeme, the meaning of a word in all its formal variants; for instance, E. *write, writes, writing, written* belong to the lexeme *write*.

Lexicon, the total number of words in a given language.

Lingual, articulated with the tongue.

Liquid, collective name for *r* and *l*.

Locative, case indicating place; e.g. *Romae* 'in Rome'.

Low, see °high.

Lowering, shift of vowels to a more open pronunciation, which corresponds with a lower position in the vowel chart (see above), e.g. *u* > *o*. See °raising and °high.

Masculine, pertaining to male.

Media, see °tenuis.

Medium, (also: middle) a verbal category which indicates that the subject is closely involved in the action.

Metathesis, a change in the order of phonemes, for instance Gr. *tiktō* < **titkō*.

Mood, a verbal category used to indicate *modality*, that is, the evaluation of a sentence in relation to other sentences. Examples are desire, expectation, possibility, necessity, etc.

Morpheme, the smallest element of a language to carry a meaning; *resolved* contains three morphemes *re-, solv-, -ed*.

Morphology, the study of word forms. A distinction is made between word formation (derivation) and inflexion (of the noun and verb).

Morphonology, the study of the sound changes that morphemes undergo in word formation and inflexion. See °allomorph.

Motion, deriving a word designating a female from the word for the male, as *princess* from *prince*.

Muta, ('dumb'), a °stop.

Mutation, changes in sounds under the influence of other sounds, such as °umlaut. For example the initial mutations of the Celtic languages, where the first consonant changed under the influence of the (last sound of the) ending of the previous

word, which later disappeared, e.g. Welsh *tad* 'father', *fy nhad* 'my father', *ei dad* 'his father'.

Nasal, a sound made with the airstream going through the nose, e.g. *m* and *n*.

Nasalisation, articulation of a vowel whereby part of the air escapes through the nose. Fr. *un* has a nasalised vowel.

Neuter, grammatical gender which is neither masculine nor feminine.

Neutralisation, the loss of a °phonological opposition between two or more sounds. At the end of a word in Dutch, the difference between *t* and *d* is neutralised.

Noun, all non-verbal forms. Mostly only the substantive is meant.

Obstruent, a sound produced by closing (occlusive, explosive or stop) or constricting (fricative, spirant) the air passage.

Occlusive, see °obstruent.

Opposition, see °phonological opposition.

Optative, mood expressing primarily a desire.

Oral, a sound spoken with the air escaping through the mouth, not through the nose.

Oxytonon, word with final (acute) stress; paroxytonon is a word with the stress on the second last syllable, proparoxytonon on the third last syllable. See °barytonon and °perispomenon.

Palatal, sound produced by raising the tongue toward the hard palate.

Paradigm, the group of various inflected forms of a declinable word.

Paradigmatic relationship, two entities (sounds, words, meanings) are in a paradigmatic relationship if they can be placed in the same position and are therefore in opposition to each other. The opposite is called °syntagmatic relationship.

Participle, an adjective formed from a verbal stem.

Periphrastic, a category expressed with an °auxiliary and a main verb; for instance periphrastic Lat. *laudatus est* 'he has been praised' as opposed to *laudavit* 'he has praised'.

Perispomenon, a word in Greek with a circumflex accent on the last syllable, properispomenon on the second last syllable. See °oxytonon.

Pharyngal, a sound produced in the pharynx, the cavity behind the mouth down to the larynx. Pharyngeal consonants are hardly found in Europe, but occur e.g. in Arabic and in Caucasian languages.

Phoneme, a sound which distinguishes words. In E. *b* and *p* are separate phonemes, witness *big* and *pig*. A single phoneme can have several °allophones.

Phonetic, pertaining to the physical characteristics of sounds.

Phonetics, the study of the production (articulatory phonetics), the physical characteristics (physical or acoustic phonetics) and the perception (auditive or perceptive phonetics) of speech sounds.

Phonological opposition, two sounds are in phonological opposition (are °phonemes) if the difference between them distinguishes between two words, as E. *th* : *s* in *think* : *sink.*

Phonological, relating to °phonemes, as opposed to °phonetic.

Phonology, the study of the sound system (the °phonemes) of a language.

Plosive, see °obstruent.

Plurale tantum, a word that can only be used in the plural, as E. *measles.*

Polnoglasie, the development of tautosyllabic *er*, *or* etc. to *ere*, *oro* in Russian, e.g. *péred* 'before' < *perd (OCS *prědъ*, with metathesis).

Postposition, a word placed after the word it governs, e.g. *honōris causā* 'for the sake of honour'; as opposed to a °preposition.

Predicate, a verb or syntagm with a verb.

Predicative, a noun or noun group used as a complement of a verb, e.g. *a lot of work* in *that is a lot of work.*

Prefix, see °affix.

Preposition, see °postposition.

Preterite, the past tense in languages that do not oppose several past tenses (like imperfect, aorist, perfect).

Preverb, a °morpheme added before a verbal stem in order to change the lexical meaning; for instance *under* in E. *under-estimate.*

Proclitic, an °enclitic word preceding the word with which it forms a unit.

Productive, a morphological procedure is productive if it can keep being applied to new forms, e.g. *-ish* (*smallish*, *biggish*): *fourish.*

Progressive assimilation, (also perseverant) °assimilation whereby the following sound is influenced by the previous sound, e.g. NHG *Zimmer* < MHG *zimber.*

Proterodynamic, see °hysterodynamic.

Prothesis, a sound automatically added at the beginning of a word because of its structure, e.g. the *i-* in Turkish *istasyon* 'station'.

Raising, shift of vowels to a more closed pronunciation, which corresponds with a higher position in the vowel chart (see above), e.g. *e* > *i*. See °lowering.

Redundancy, information given above that which is strictly necessary. In Lat. *acrēs oculī* '(the) eyes (are) sharp' both forms signal the plural.

Referent, an entity to which a form refers.

Regressive assimilation, (also: anticipatory) °assimilation whereby the following sound influences the previous sound, e.g. Lat. *affero* < **abfero.*

Resonant, (G. Sonant), a consonant which can be used like a vowel, e.g. *r̥*. See sonorant.

Retroflex, a sound produced by curling back the tongue. Sanskrit *ṭ* and *ṣ* are retroflexes.

Rhotacism, the development of a consonant to *r*. For instance Lat. *gener-is* < **genes-.*

Root, the °morpheme of a word carrying the basic meaning, as opposed to °affix(es) and endings. E.g. *run* in *running, runner, a run*.

Root aorist, -present, -nouns, aorists etc. formed from the root (with ending but) without a suffix.

Rounded, sounds produced with lip-rounding, such as *o*, *u*.

Samprasāraṇa, the change (ablaut) between a resonant followed by a vowel and the resonant without that vowel, e.g. **suopnos/*supnos*.

s-mobile, the *s*- that can be present or absent at the beginning of certain PIE roots, without recognizable difference in meaning, cf. E. *melt*: *smelt*. Cf. 12.1.5

Sandhi, assimilation between two words, e.g. Gr. *am pedíon* from *an*.

Satem languages, see °centum languages.

Segment(al), (referring to) parts of speech which can be isolated in the speech continuum, like sounds/phonemes, as opposed to suprasegmental elements like stress and intonation.

Semivowel, the sounds *y* and *w*. See °glide.

Seṭ, literally "with *i*". Sanskrit term for a root ending in *-i*. See °aniṭ, °disyllabic root.

Shwa, (G. Schwa) the name for a neutral vowel, *ə* (as the *e* in E. *taken*). The term was taken from Hebrew.

Sibilant, fricatives and affricates pronounced with a hissing sound, like *s, z, š, ž, ts, tš*.

Singulative, see °collective.

Sonorant, sounds usually produced as voiced: vowels, nasals, liquids, approximants. The difference between sonorant and °resonant is not always defined in the same way.

Spirant, see °fricative.

Spread vowel, sound spoken by spreading as opposed to rounding the lips.

Static, the PIE inflectional type which has the stress fixed on the root; see 13.2.4 and 13.2.7. Also acrostatic.

Stative, a verb (form) referring to a state, not to a process.

Stem, a word without its flexional ending.

Stop, see °obstruent.

Subjunctive, mood of the verb, expressing will or expectation (depending on the language).

Substratum, a language which influenced a language which arrived later in the same area. See 3.3 and 4.11.

Suffix, see °affix.

Suppletion, the use of different roots in one paradigm, e.g. *good* : *better*.

Suprasegmental, see °segmental.

Svarabhakti vowel, a vowel that can be inserted between two consonants (but which has no phoneme status), as in Dutch *[mɛlək]* for *melk*.

Svarita, see °udātta.

Syllable, the sequence of a vowel, whether or not preceded by or followed by one or more consonants. The structure of syllables depends on the language (stage). Thus, Gr. gen. 'of the father' was at first (Hom.) syllabified as *pat-rós*, and later became (Att.) *pa-trós.*

Synchronic, see °diachronic.

Syncope, the loss of a vowel in the middle of a word, e.g. Lat. *auspex* < *aui-spex 'bird-watcher'.

Syntagm, any group of words forming a unity, e.g. *on the hill.*

Syntagmatic relationship, the relationship between the parts of a sentence or a group of words.

Tautosyllabic, belonging to the same °syllable. Opposite: heterosyllabic.

Tense (adj.), sounds pronounced with a considerable muscular effort. Opposite: lax.

Tense (subst.), category of the verb which indicates the time of the action or state.

Tenuis, ('thin'), Greek/Latin term for voiceless (unaspirated) °stops. Voiced stops were called media.

Thematic, a term from IE verb morphology meaning 'with a stem vowel', namely (PIE) *e or *o; for instance Gr. *lég-o-men*, *lég-e-te* 'we, you say'. As opposed to athematic, e.g. Gr. *phē-mí* 'I say'. Thematic is also used with nouns to refer to the *o*-stems.

Udātta, 'raised', the Sanskrit term for the main stress (pitch). Anudātta ('not raised') is the low tone, svarita ('sounded') a middle tone, the one immediately following the main tone.

Umlaut, vowel changes under the influence of another vowel (sometimes also a consonant); e.g. OHG *gast*, pl. *gesti*, with *a* > *e* due to *-i.*

Uvular, a sound produced by moving the back of the tongue toward the uvula as in the rolled *r* and Spanish *j* in *Juan.*

Velar, sound produced by closing or constricting the airstream with the back part of the tongue against the velum, e.g. *k*. Also: guttural. Because these sounds are made with the part of the tongue called dorsum, also: dorsal.

Vowel, in phonetics: a sound whereby the airstream passes unobstructed. In phonology: the core of a syllable.

Vocative, case for the person addressed.

Vṛddhi, term from Sanskrit grammar: the ablaut form with a lengthened vowel (PIE *ē, *ō). See °*guṇa* and °ablaut.

Zero, linguistic term for nothing, no sound; sign Ø.

Zero grade, see °ablaut.

Bibliography

The bibliography is organized in three parts: I. General introduction, II. Language change, and III. Indo-European Linguistics. The focus is on English and German titles, less so on French. Of course, useful handbooks and specialist studies also appear in other languages, such as Czech, Danish, Dutch, Italian, Russian, Spanish, etc. The titles in Section 1 and 2 may be regarded as 'further reading', whereas in Section 3, the selection also refers to the basis on which the theories proposed in this book are founded.

Abbreviations

BBS = Kortlandt, F. *Baltica & Balto-Slavica*. Amsterdam/New York: Rodopi 2009.

BSL = *Bulletin de la société de linguistique de Paris*.

IBS = *Innsbrucker Beiträge zur Sprachwissenschaft*.

ICIL = Kortlandt, F. *Italo-Celtic origins and prehistoric development of the Irish language*. Amsterdam/New York: Rodopi 2007.

FS = Festschrift

KZ (also ZVS) = *Zeitschrift für vergleichende Sprachforschung*. Göttingen 1852. (Now HS *Historische Sprachforschung*.)

MSS = *Münchener Studien zur Sprachwissenschaft*.

ÖAW = *Österreichische Akademie der Wissenschaften*.

SGIEIU = Kortlandt, F. *Studies in Germanic, Indo-European and Indo-Uralic*. Amsterdam/New York: Rodopi, 2010.

UP = University Press

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Albanian

Grammars:

Camaj, M. 1984 *Albanian grammar with exercises, chrestomathy and glossaries*. Wiesbaden: Harrassowitz.

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Texts in translation:

Fishta, Gj. 2003 *The Highland lute: the Albanian national epic, cantos I–V: the cycle of Oso Kuka*. Translated from the Albanian by Robert Elsie. Pejë: Dukagjini.

Gjecov, Sh. & L. Fox. 1989 *Kanuni i Lekë Dukagjinit: The Code of Lekë Dukagjini*. New York: Gjonlekaj.

Dictionaries:

Demiraj, B. 1997 *Albanische Etymologien*. Amsterdam: Rodopi.

Huld, M. 1984 *Basic Albanian etymologies*. Columbus, Ohio: Slavica.

Orel, V. 1998 *Albanian etymological dictionary*. Leiden: Brill.

Baltic

Grammars:

Ambrazas, V. (ed.) 2006 *Lithuanian Grammar*. 2nd ed. Vilnius: Baltos Lankos.

Endzelin, J. 1923 *Lettische Grammatik*. Heidelberg: Winter.

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Stang, Ch. 1966 *Vergleichende Grammatik der baltischen Sprachen*. Oslo: Universitetsforlaget.

Trautmann, R. 1910 *Die altpreussischen Sprachdenkmäler*. Göttingen: Vandenhoeck & Ruprecht.

Texts:

Mažiulis, V. 1966–1981 *Prūsų kalbos paminklai*. 2 vols. Vilnius: Mintis.

Dictionaries:

Fraenkel, E. 1962–1965 *Litauisches etymologisches Wörterbuch*. Heidelberg: Winter.

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Toporov, V. 1975-*Prusskij jazyk, Slovar'*. Moscow: Nauka.

Trautmann, R. 1923 *Baltisch-slavisches Wörterbuch*. Göttingen: Vandenhoeck & Ruprecht.

Slavic

Grammars:

Bräuer, H. 1961–1969 *Slavische Sprachwissenschaft*. 3 vols. Berlin: de Gruyter.

Leskien, A. 1962 *Handbuch der altbulgarischen Sprache*. 8th ed. Heidelberg: Winter.

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Zaliznjak, A. 2004 *Drevnenovgorodskij dialekt*. 2nd ed. Moscow: Nauka.

http://gramoty.ru/ (all Old Russian birchbark texts)

Texts in translation:

Auty, R. & D. Obolensky (eds.) 1977 *An introduction to Russian language and literature*. Cambridge UP.

Grasshoff, H. 1973 *Altrussische Dichtung aus dem 11.-18. Jahrhundert*. Leipzig: Reclam.

The lay of the war waged by Igor. 1981 Moscow: Progress. [Text, modern Russ. and Eng. transl.]

Trubetzkoy, N. 1973 *Vorlesungen über die altrussische Literatur*. Firenze.

Dictionaries:

Derksen, R. 2008 *Etymological dictionary of the Slavic inherited lexicon*. Leiden/Boston: Brill.

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Trubachev, O. 1974- *Ètimologičeskij slovar' slavjanskix jazykov*. Moscow: Nauka.

Vasmer, M. 1953–1958 *Russisches etymologisches Wörterbuch*. Heidelberg: Winter.

Italic

Grammars:

Baldi, P. 1999 *The foundations of Latin*. Berlin / New York: Mouton de Gruyter.

Leumann, M. 1977 *Lateinische Laut- und Formenlehre*. München: Beck.

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Monteil, P. 1970 *Éléments de phonétique et de morphologie du latin*. Paris: Klincksieck.

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Meiser, G. 1986 *Lautgeschichte der umbrischen Sprache*. Innsbruck: IBS.

Texts

Rix, H. 2002 *Sabellische Texte. Die Texte des Oskischen, Umbrischen und Südpikenischen*. Heidelberg: Winter.

Dictionaries

Ernout, A. & A. Meillet 1967 *Dictionnaire étymologique de la langue latine*. 4th ed. Paris: Klincksieck.

Untermann, J. 2000 *Wörterbuch des Oskisch-Umbrischen*. Heidelberg: Winter.

de Vaan, M. 2008 *Etymological dictionary of Latin and the other Italic languages*. Leiden: Brill.

Walde, A. & J. Hoffmann. 1930–1954 *Lateinisches etymologisches Wörterbuch*. 2 vols. Heidelberg: Winter.

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Lejeune, M. 1974 *Manuel de la langue vénète*. Heidelberg: Winter.

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Celtic

Grammars:

Lewis, H. & H. Pedersen 1937 *A concise comparative Celtic grammar*. Göttingen: Vandenhoeck & Ruprecht. Supplement 1961.

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Hemon, R. 1975 *A historical morphology and syntax of Breton*. Dublin: Institute for Advanced Studies.

Jackson, K. 1953 *Language and History in Early Britain: a chronological survey of the Brittonic languages, first to twelfth century A.D.* Edinburgh UP.

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Duval, P.-M. (ed.) 1985–2002 *Recueil des inscriptions gauloises*. Paris: CNRS.

Rowland, J. 1990 *Early Welsh saga poetry. A study and edition of the Englynion*. Cambridge: Brewer.

Sims-Williams, P. 2006 *Ancient Celtic place-names in Europe and Asia Minor*. Oxford: Blackwell.

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Untermann, J. 1997 *Monumenta Linguarum Hispanicarum*. Vol. 4: *Die tartessischen, keltiberischen und lusitanischen Inschriften*. Vol. 5: *Wörterbuch der keltiberischen Inschriften*. Wiesbaden: Reichert.

Texts in translation:

Cross, T. & C. Slover. 1936 (= 1969) *Ancient Irish tales*. Totowa (NJ): Barnes & Noble.

Gantz, J. 1981 *Early Irish myths and sagas*. Harmondsworth: Penguin.

Jackson. K. 1969 *The Gododdin*. Edinburgh UP.

Jackson, K. 1971 *A Celtic miscellany*: *Translations from the Celtic literature*. Harmondsworth: Penguin.

Jarman, A. 1981 *The Cynfeirdd. Early Welsh poets and poetry*. Cardiff: University of Wales.

Jarman, A. & G. Rees Hughes. 1992 *A guide to Welsh literature, vol. 1*. Revised ed. Cardiff: University of Wales.

The Mabinogion. 1974 Translated by G. Jones and Th. Jones. London: Everyman.

The Mabinogi and other medieval Welsh tales. 1977 Translated by P. Ford. Berkeley: University of California.

The Táin. 1970 Translated by Th. Kinsella. Oxford UP.

Dictionaries:

Delamarre, X. 2001 *Dictionnaire de la langue gauloise*. Paris: Errance.

Dictionary of the Irish language: based mainly on old and middle Irish materials. 1913–1976 Dublin: Royal Irish Academy.

Geiriadur Prifysgol Cymru ['Dictionary of the University of Wales'] 1950–2002 Cardiff: Gwasg Prifysgol Cymru.

Matasović, R. 2009 *Etymological dictionary of Proto-Celtic*. Leiden/Boston: Brill.

Schumacher, S. 2004 *Die keltischen Primärverben. Ein vergleichendes, etymologisches und morphologisches Lexikon*. Innsbruck: IBS.

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Germanic

Grammars:

Boutkan, D. 1995 *The Germanic 'Auslautgesetze'*. Amsterdam: Rodopi.

Hirt, H. 1931–1934 *Handbuch des Urgermanischen*. 3 vols. Heidelberg: Winter.

Krahe, H. & W. Meid 1965–1969 *Germanische Sprachwissenschaft*. 3 vols. Berlin: de Gruyter.

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Prokosch, E. 1939 *A comparative Germanic grammar*. Philadelphia: LSA.

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Krause, W. 1970 *Runen*. Berlin: de Gruyter.

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Krause, W. 1968 *Handbuch des Gotischen*. 3rd ed. München: Beck.

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Heusler, A. 1931 *Altisländisches Elementarbuch*. Heidelberg: Winter.

Nedoma, R. 2001 *Kleine Grammatik des Altisländischen*. Heidelberg: Winter.

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Quirk, R. & C. Wrenn 1989 *An Old English grammar*. London: Routledge.

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Sjölin, B. 1969 *Einführung in das Friesische*. Stuttgart: Metzler.

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Gallée, J. & H. Tiefenbach. 1993 *Altsächsische Grammatik*. 3rd ed. Tübingen: Niemeyer.

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Quak, A. & J. van der Horst. 2002 *Inleiding Oudnederlands*. Leuven: University Press.

Texts:

Streitberg, W. 2000 *Die gotische Bibel*. 7th ed. Heidelberg: Winter.

Krause, W. & H. Jankuhn. 1966 *Die Runeninschriften im älteren Futhark*. 2 vols. Göttingen: Akademie der Wissenschaften.

Lühr, R. 2000 *Die Gedichte des Skalden Egill*. Dettelbach: Röll.

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Braune, W. & E. Ebbinghaus. 1994 *Althochdeutsches Lesebuch*. 17th ed. Tübingen: Niemeyer.

Texts in translation:

Beowulf. Translated by D. Wright. 1957 Harmondsworth: Penguin.

The elder Edda, a selection transl. by P. Taylor & W.H. Auden. 1969 London: Faber & Faber.

Heusler, A. 1957 *Die altgermanische Dichtung*. Darmstadt: Wiss.Buchges.

Njál's Saga. Transl. by M. Magnusson and H. Pálsson. 1972 Harmondsworth: Penguin.

Simek, R. & H. Pálsson. 2007 *Lexikon der altnordischen Literatur*. 2nd ed. Stuttgart: Kröner.

Snorri Sturluson, *Edda*. New complete translation by A. Faulkes. 1987 London: Everyman.

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Heidermanns, F. 1993 *Etymologisches Wörterbuch der germanischen Primäradjektive*. Berlin: de Gruyter.

Seebold, E. 1970 *Vergleichendes und etymologisches Wörterbuch der germanischen starken Verben*. The Hague: Mouton.

Lehmann, W. 1986 *A Gothic etymological dictionary*. Leiden: Brill.

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Hoad, T. 1986 *The concise Oxford Dictionary of English etymology*. Oxford UP.

Holthausen, F. 1934 *Altenglisches etymologisches Wörterbuch*. Heidelberg: Winter.

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Sjölin, B. 2006 *Etymologisches Handwörterbuch des Festlandsnordfriesischen*. Kiel: Christian-Albrechts-Universität.

Kluge, F. & E. Seebold 2002 *Etymologisches Wörterbuch der deutschen Sprache*. 24th ed. Berlin/New York: de Gruyter.

Lloyd, A. & O. Springer 1988- *Etymologisches Wörterbuch des Althochdeutschen*, I-. Göttingen: Vandenhoeck & Ruprecht. [4 vols. containing *a-h* have appeared until now]

Tiefenbach, H. 2010 *Altsächsisches Handwörterbuch. A concise Old Saxon dictionary*. Berlin/New York: de Gruyter.

Franck, J. & N. van Wijk. 1912 *Franck's etymologisch woordenboek der Nederlandsche taal*. 2nd ed. The Hague: Nijhoff.

Philippa, M., F. Debrabandere & A. Quak (eds.) 2003–2009 *Etymologisch woordenboek van het Nederlands*. 4 vols. Amsterdam UP.

de Vries, J. 1971 *Nederlands etymologisch woordenboek*. Leiden: Brill.

Fragmentary languages

Illyrian

Krahe, H. 1955–1964 *Die Sprache der Illyrer*. Wiesbaden: Harrassowitz.

Solta, G. 1980 *Einführung in die Balkanlinguistik*. Darmstadt: Wiss. Buchgesellschaft.

Thracian, Macedonian

Russu, I. 1969 *Die Sprache der Thrako-Daker*. Bucarest: Editura ştiinţifică.

Detschew, D. 1957 *Die thrakischen Sprachreste*. Vienna: Rohrer.

Velkova, Z. 1986 *The Thracian glosses*. Amsterdam: Hakkert.

Kalléris, J. 1954–1976 *Les anciens Macédoniens: Étude linguistique et historique*. Athens: Institut français d'Athènes.

Katičić, R. 1976 *Ancient languages of the Balkans*. 2 vols. The Hague/Paris: Mouton.

Messapian

Santoro, C. 1982 *Nuovi studi messapici*. Galatina: Congedo.

Parlangeli, O. & C. Santoro. 1978 II Messapico. In: *Popoli e civiltà dell' Italia antica: lingue e dialetti*, ed. A. Prosdocimi. Rome: Biblioteca di Storia Patria.

de Simone, C. & S. Marchesini. 2002 *Monumenta Linguae Messapicae*. 2 vols. Wiesbaden: Reichert.

Sicily

Agostiniani, L. 1977 *Iscrizione anelleniche di Sicilia: le iscrizione elime*. Florence: Olschki.

Agostiniani, L. 1992 Les parlers indigènes de la Sicile prégrecque. *LALIES* 11, 37–74.

Zamboni, A. 1978 Il Siculo. In: *Lingue e dialetti dell' Italia antica*, ed. A. Prosdocimi. Rome: Biblioteca di Storia Patria, 951–1012.

Schmoll, U. 1958 *Die vorgriechischen Sprachen Siziliens*. Wiesbaden: Harrassowitz.

Lusitanian

Untermann, J. 1997 *Monumenta Linguarum Hispanicarum*. Vol. 4: *Die tartessischen, keltiberischen und lusitanischen Inschriften*. Wiesbaden: Reichert.

III.2 The reconstruction of PIE

This section lists a number of studies on special problems discussed in or relevant to PIE phonology and morphology. Numbers refer to the sections of the present book. The studies mentioned are selected because (a) they give a good introduction or overview of the relevant question, or because (b) they form the scholarly basis of the views presented in the present book. It is therefore a very personal selection, which does not in any way aspire at exhaustiveness or present a balanced view of the field. Other scholarly literature on the relevant subjects can be found through the studies mentioned below, or via the introductions mentioned in III.1.

2.4   Indo-Hittite

Kloekhorst, A. 2008 Some Indo-Uralic aspects of Hittite. *Journal of Indo-European Studies* 36, 88–95.

Kloekhorst, A. 2008 *Etymological Dictionary of the Hittite Inherited Lexicon*, Leiden: Brill, 7–11.

Kortlandt, F. 2010 An outline of Proto-Indo-European. In: F. Kortlandt, *Studies in Germanic, Indo-European and Indo-Uralic*. Amsterdam/New York: Rodopi, 37–45.

Oettinger, N. 2006 Review of: J. Jasanoff, *Hittite and the Indo-European verb* (Oxford UP 2003). In: *Kratylos* 51, 34–45, in particular p. 39f.

Zeilfelder, S. 2001 *Archaismus und Ausgliederung. Studien zur sprachlichen Stellung des Hethitischen.* Heidelberg: Winter.

2.5   Indo-Uralic, Nostratic

Bomhard, A. 2008 *Reconstructing Proto-Nostratic*. 2 vols. Leiden: Brill.

Greenberg, J. 2000 *Indo-European and its closest relatives. The Eurasiatic language family. Vol. I: Grammar*. Stanford UP.

Kortlandt, F. 2010 Indo-Uralic and Altaic. *SGIEIU* 415–418.

Kortlandt, F. 2010 Indo-Uralic and Altaic revisited. *SGIEIU* 419–428.

3.3   The arrival of the Indo-Europeans; IE and non-IE substrates

Beekes, R. 2003 The prehistory of the Lydians, the origin of the Etruscans, Troy and Aeneas. *Bibliotheca Orientalis* 59, 205–241.

Beekes, R. 2010 Pre-Greek loanwords in Greek. In: Beekes, R. *Etymological dictionary of Greek*. Vol. 1, p. xiii–xlii. Leiden/Boston: Brill 2010.

Holzer, G. 1989 *Entlehnungen aus einer bisher unbekannten indogermanischen Sprache im Urslavischen und Urbaltischen*. Vienna: ÖAW.

Kortlandt, F. 2010 C. C. Uhlenbeck on Indo-European, Uralic and Caucasian. *SGIEIU* 31–36.

Kortlandt, F. 2010 An Indo-European substratum in Slavic? *SGIEIU* 73–80.

Lubotsky, A. 2001 The Indo-Iranian substratum. In: Carpelan, C., Parpola, A., Koskikallio, P. (eds.) *Early Contacts between Uralic and Indo-European: Linguistic and Archaeological Considerations*, Helsinki: Societé finno-ougrienne, 301–317.

Schrijver, P. 2000 Non-Indo-European surviving in Ireland in the first millennium AD. *Ériu* 51, 95–99.
Schrijver, P. 2005 More on non-Indo-European surviving in Ireland in the first millennium AD. *Ériu* 55, 137–144.

11.3.2 & 11.3.3 Palatals, velars and labiovelars, The three velar series

Meillet, A. 1894 De quelques difficultés de la théorie des gutturales indo-européennes. *Mémoires de la Société de Linguistique de Paris* 8, 277–304.
Kortlandt, F. 2010 Indo-European palatovelars before resonants in Balto-Slavic. In: *BBS* 27–32.
Kümmel, M. 2007 *Konsonantenwandel*. Wiesbaden: Reichert. Pp. 310–327.
Lubotsky, A. 2001 Reflexes of Proto-Indo-European **sk* in Indo-Iranian. *Incontri linguistici* 24, 25–57.

11.3.6   Glottalized consonants

Gamkrelidze, T. 1981 Linguistic typology and language universals. In: Y. Arbeitman & A. Bomhard (eds.), *Bono homini donum. Festschrift Kerns*, Amsterdam: Benjamins, 571–609.
Kortlandt, F. 2009 Remarks on Winter's law. *BBS* 65–71.
Kortlandt, F. 2009. Winter's law again. *BBS* 73–76.
Kortlandt, F. 2010 PIE glottalic stops: The comparative evidence. *SGIEIU* 53–65.
Kortlandt, F. 2010 General linguistics and Indo-European reconstruction. *SGIEIU* 7–20.
Kortlandt, F. 2010 Greek numerals and PIE glottalic consonants. *SGIEIU* 105–109.
Kortlandt, F. 2007 Lachmann's law again. *ICIL* 121–123.
Kümmel, M. 2007 *Konsonantenwandel*. Wiesbaden: Reichert. Pp. 299–310.
Lubotsky, A. 2007 Sanskrit *-na-* participles and the glottalic theory. *Verba Docenti. FS Jasanoff*, ed. A. Nussbaum, Ann Arbor/New York: Beech Stave, 232–235.
Winter, W. 1978 The distribution of short and long vowels in stems of the type Lith. *ésti: vèsti: mèsti* and OCS *jasti: vesti: mesti* in Baltic and Slavic languages. In: J. Fisiak (ed.), *Recent developments in historical phonology*, The Hague: Mouton, 431–446.

11.3.8   The Gmc. and HG sound shifts

Kortlandt, F. 2010 Vestjysk stød, Icelandic preaspiration, and PIE glottalic stops. *SGIEIU* 165–168.
Kortlandt, F. 2010 Proto-Germanic obstruents. *SGIEIU* 169–174.
Kortlandt, F. 2010 Kluge's Law and the rise of Proto-Germanic geminates. *SGIEIU* 175–177.
Kortlandt, F. 2010 English *bottom*, German *Boden*, and the chronology of sound shifts. *SGIEIU* 197–199.
Kortlandt, F. 2010 The High German consonant shift. *SGIEIU* 249–253.
Kortlandt, F. 2010 Glottalization, preaspiration and gemination in English and Scandinavian. *SGIEIU* 293–297.
Kroonen, G. 2011. *The Proto-Germanic n-stems. A study in diachronic morphophonology*. Amsterdam / New York: Rodopi.
Lühr, R. 1988 *Expressivität und Lautgesetz im Germanischen*. Heidelberg: Winter.

Vennemann, Th. 1984 Hochgermanisch und Niedergermanisch: Die Verzweigungstheorie der germanisch-deutschen Lautverschiebungen. *Beiträge zur Geschichte der deutschen Sprache und Literatur* 106, 1–45.

11.3.9 Skt. *kṣ* — Gr. *kt*

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Maps
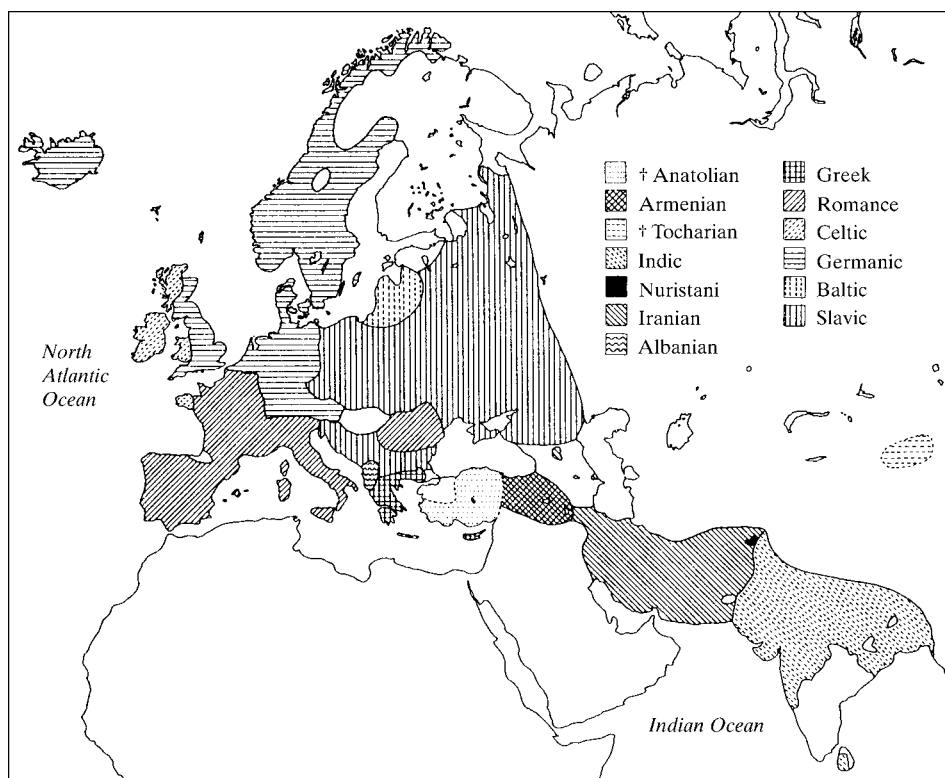
Map 1. The Indo-European languages. — Anatolian (Hittite and its relatives) has died out, as did Tocharian in Xinjiang; both were replaced by Turkic languages. Basque remained as the only non-Indo-European language in Europe. Hungarian, which belongs to the Finno-Ugric family, arrived later, in the 9th century A.D. The Iranian language west of the Caspian Sea is Ossetic. It is surrounded by Caucasian languages. In southern India Dravidian languages are spoken, of which Tamil is the best known.
Reprinted from: Merrit Ruhlen, *A Guide to the World's Languages*, Vol. 1. London, 1987, 36. With the permission of the publishers, Stanford University Press. © 1987 by the board of Trustees of the Leland Stanford Junior University.
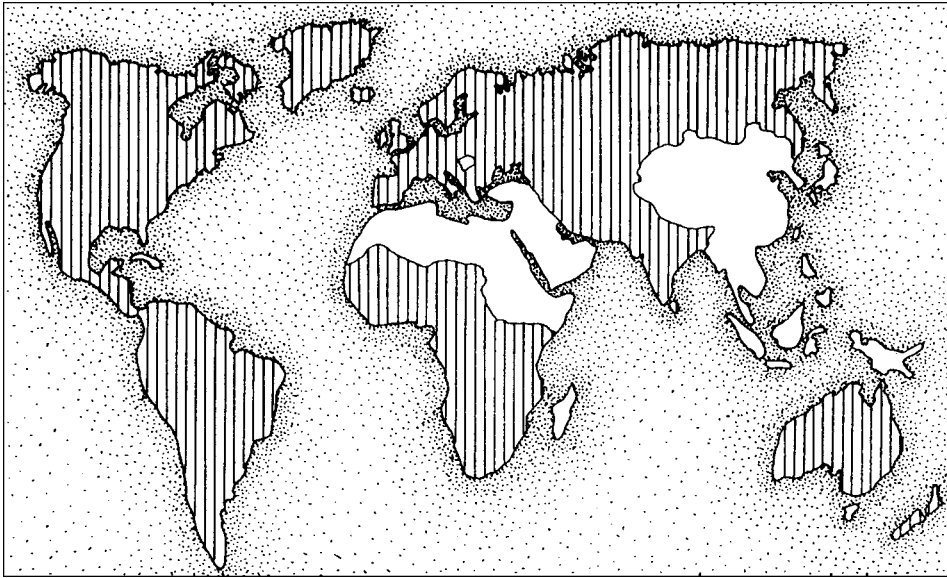
Map 2. Countries where an Indo-European language is spoken, either as the first or as an officially recognized language of state. — Nearly half of the population of the world at present speaks an Indo-European language.
From: J. P. Mallory, *In Search of the Indo-Europeans*. London 1989, 264.
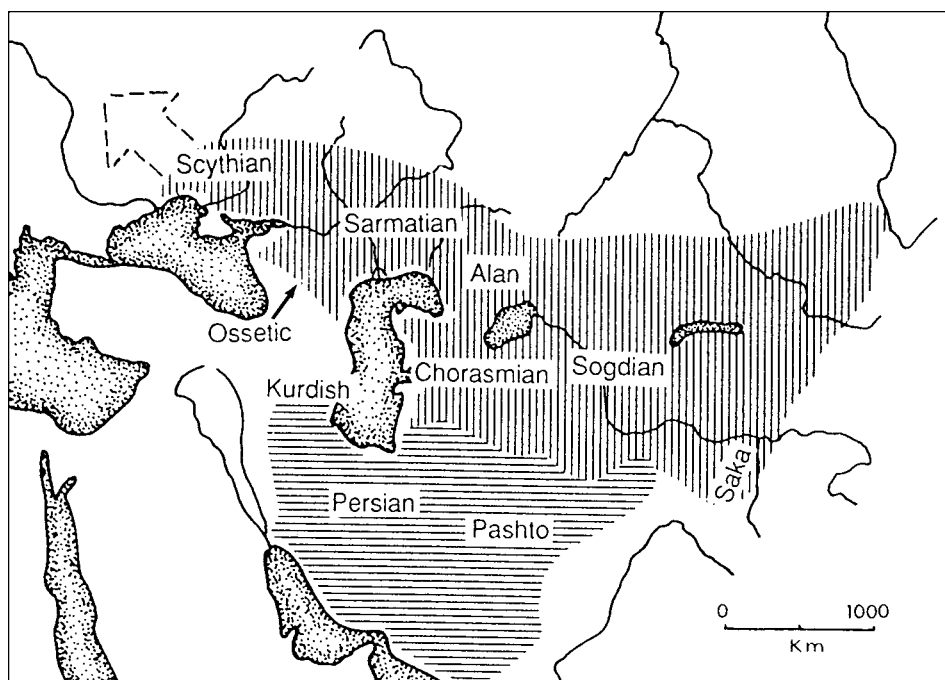
Map 3. The Iranian languages. — The Iranian languages at the time of their greatest expansion. Vertical hatching indicates the East-Iranian languages, horizontal hatching the West-Iranian languages. Pashto is the major language of Afghanistan. (Note that Pashto is an East-Iranian language.) The eastern languages are those of the peoples known to us as Scythians. Ossetic is a remnant of them. From: J.P. Mallory, *In Search of the Indo-Europeans* London, 1989, 48
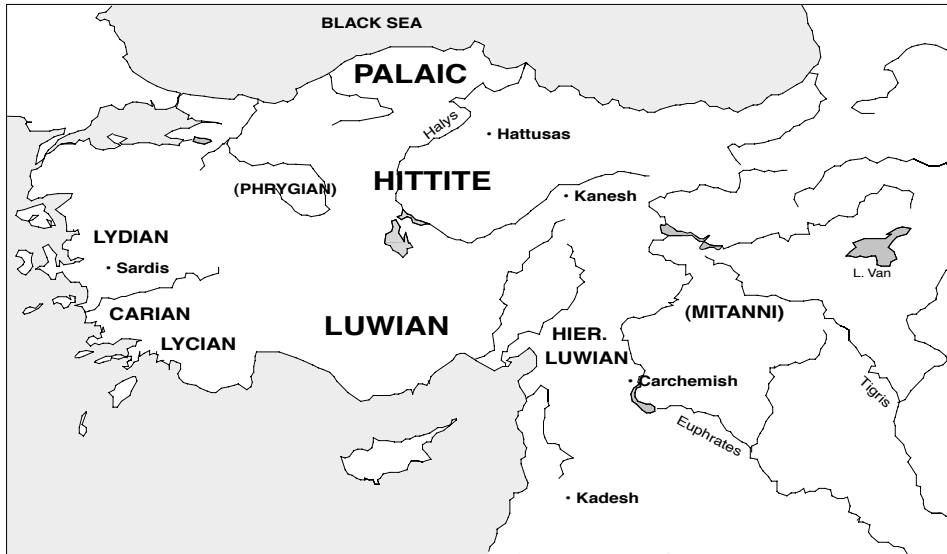
Map 4. The Anatolian languages — This group probably arrived from the north-west, across the Bosporus. The family has completely died out. Best known is Hittite, from about 1700–1200 B.C. The other languages are Palaic, Luwian (both written in cuneiform), Hieroglyphic Luwian (which survived till the 8th century B.C.), and in the west, Lycian, Carian and Lydian, known from about the 5th and 4th centuries B.C. (in alphabetic writing). — Phrygian arrived much later (after 1200 B.C.) and does not belong to this family. The Mitanni, in the 15th century B.C., spoke (non-Indo-European) Hurrian, but their rulers were Indo-Aryans.

Map 5. The Slavic languages — Note the position of Sorbian in east Germany. Rumanian is a Romance language. Hungarian is related to Finnish, as is Estonian in the north of the Baltic area. The Albanian speakers in Kosovo in former Yugoslavia, north-east of Albania, are not indicated.

Map 6. The Thracian tribes — The Thracians lived mostly in present-day Bulgaria. Serdica is now Sofia. The Daci and Getae are larger peoples, closely related to the Thracians. Between brackets non-Thracian tribes. The Dardanoi are Illyrians, the position of the Paiones is unclear, the Makedones are considered a group in themselves.

Map 7. Italy — Etruscan is a non-Indo-European language that came from the Aegean area. Greek and Phoenician are later arrivals. Messapic probably came from across the Adriatic sea. North Pice-nian is considered non-Indo-European. The position of Rhaetic, which resembles Etruscan, Ligurian (Indo-European or a substratum language?) and Siculan and Elymian is uncertain. The Italic sub-group of Indo-European consists of Latin and Oscan, Umbrian, South Picene and Pre-Samnitic. East of the Latin territory are found many small languages (formerly called 'Sabellic'), belonging to the group of Oscan and Umbrian, of which very little is known. Venetic is often considered a language on its own, but it may well have belonged to the Italic subgroup.
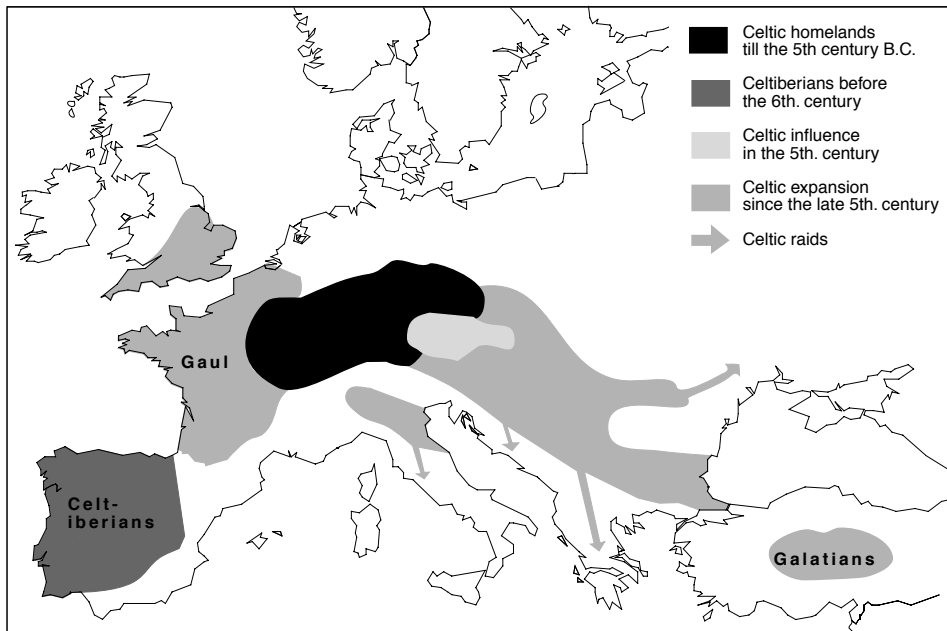
Map 8. The expansion of the Celts — The Celts can be traced back to central Europe, from where they spread in many directions. They came as far as Turkey, where the Galatians are of Celtic origin. In Italy they settled in the Po valley, in the Iberian peninsula in the east already in the 6th c. B.C. (the Celtiberians). From France they moved to the British isles, where their languages survived. The speakers of Breton crossed from Britain to Brittany in the 5th and 6th centuries A.D..

Map 9. The Celtic tribes in Britain — The whole of England, and Ireland, was Celtic at the time of the Roman conquest. The most recent view is that the Picts too were Celts and that their case was not different from the other peoples. — The Old Welsh epic the *Gododdin* continues the name of the *Votadini*.
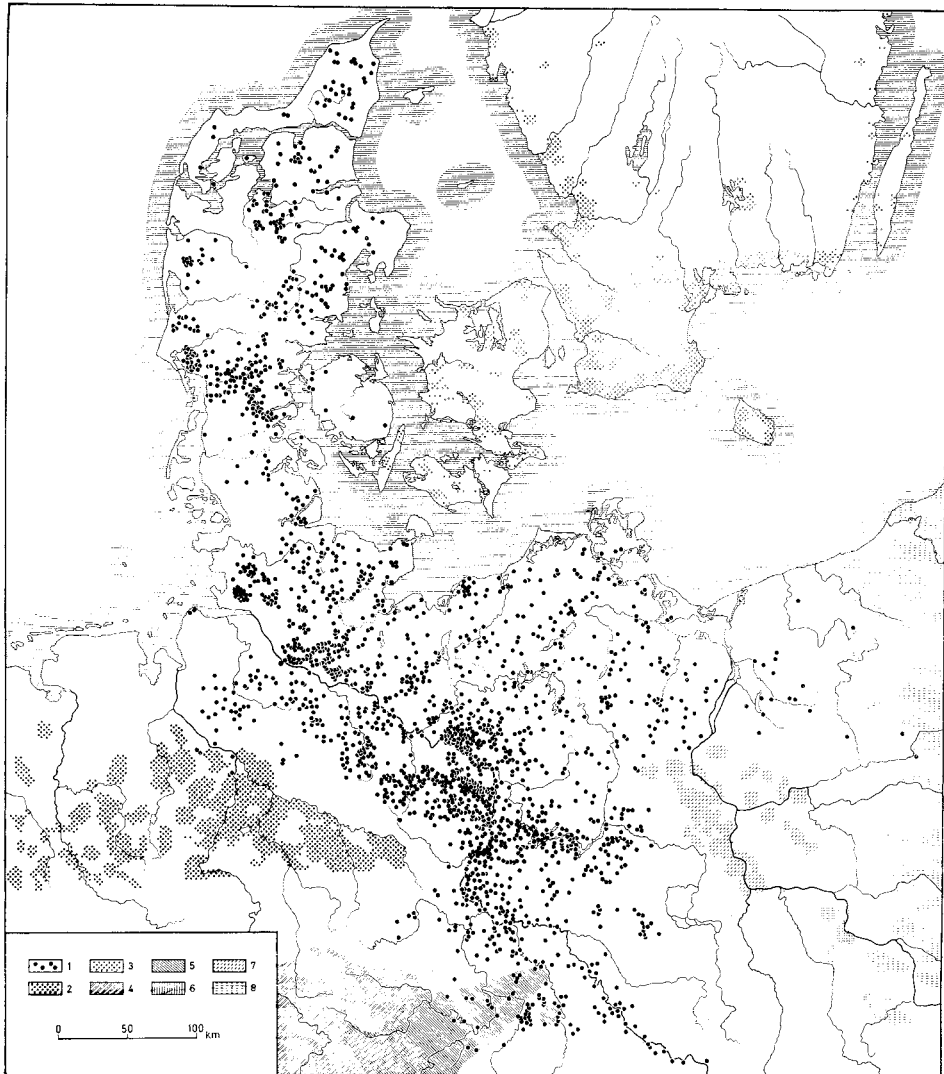
Map 10. The Jastorf culture — This culture (nr. 1) is the oldest stage which we can confidently assign to the Germanic peoples, just before they split up. It is found in Denmark and south of it in Germany. It dates from 600–300 B.C. The Harpstedt culture (nr. 2) west of it may be closely related. The Jastorf culture seems to have developed without interruption from earlier Bronze Age cultures in the same area, which again derive from the Corded Ware complex (see Map 13). From: *Die Germanen. Geschichte und Kultur der germanischen Stämme in Mitteleuropa*, Bd. I. Darmstadt, 1988, 96–97.
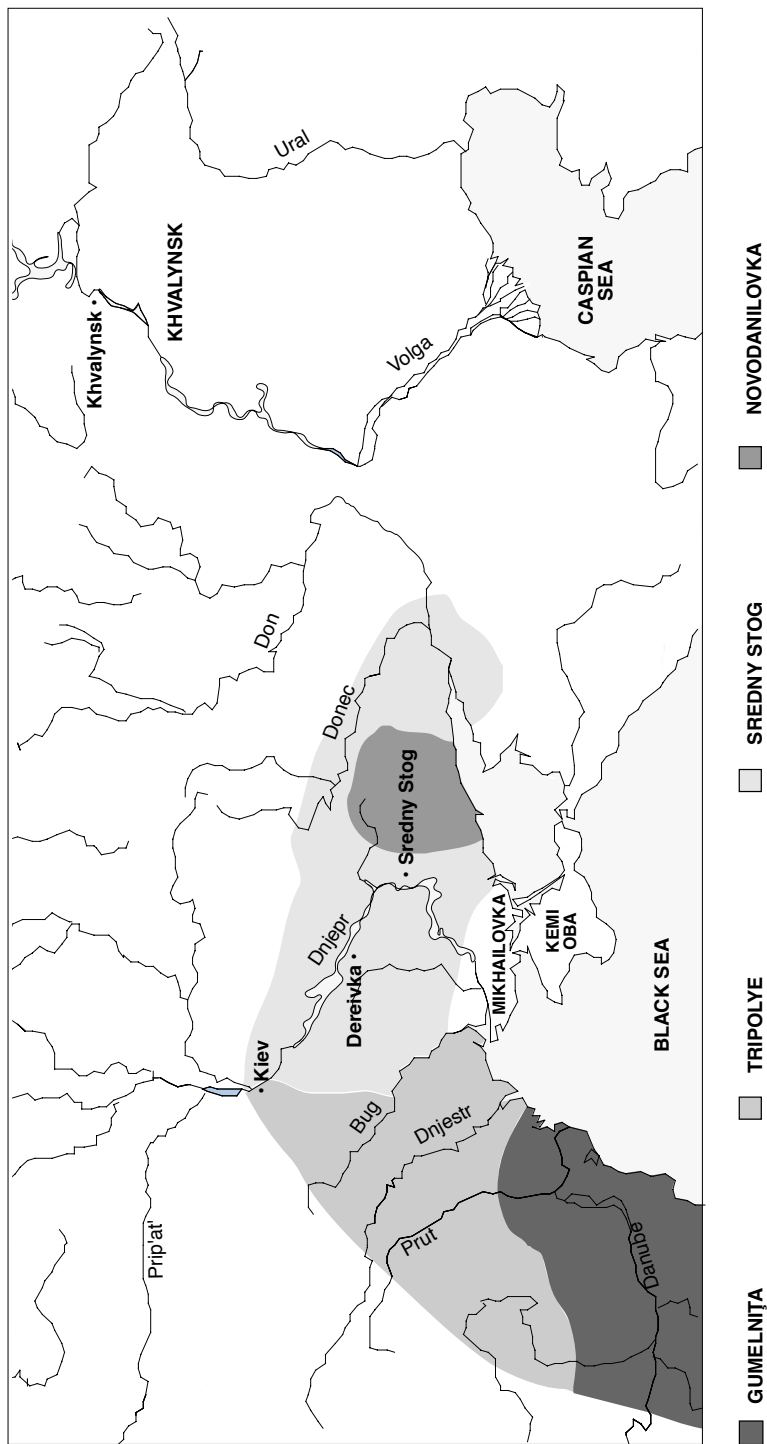
Map 11. The Sredny Stog culture — The latest research has confirmed the old view that the Indo-Europeans originated from the south Russian steppes, especially the area of the Ukraine. Here the Sredny Stog culture (± 4500–3500) fits very well what we know about the Indo-Europeans on the basis of their vocabulary. The Novodanilovka and Lower Mikhailovka-Kemi Oba cultures are closely related. Here for the first time the horse was tamed. — The Tripolye culture to the west, a very refined culture, is decidedly non-Indo-European.

GUMELNIŢA   TRIPOLYE   SREDNY STOG   NOVODANILOVKA
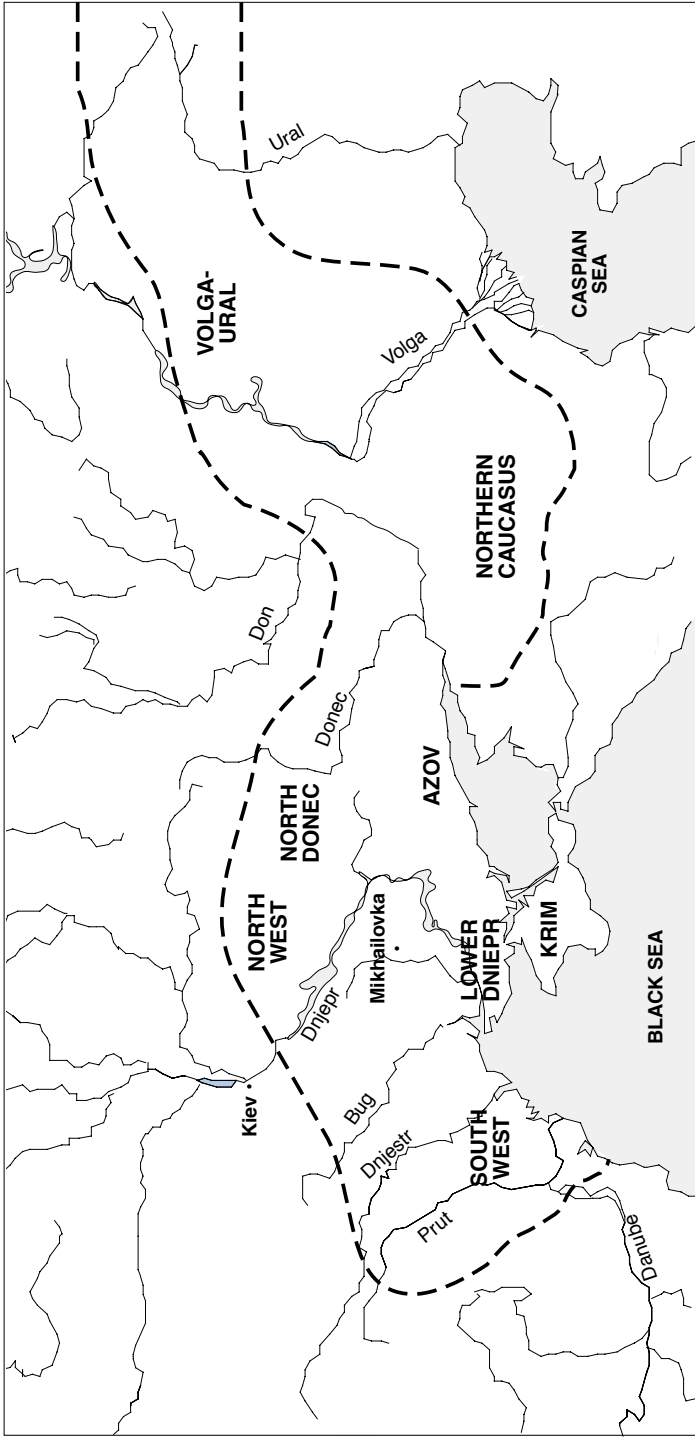
Map 12. The Yamnaya (Pit Grave) culture — This complex, that stretched out over a very great area, developed out of the Sredny Stog culture. (The names indicate regional variants.) It lasted from ± 3600–2200. In this time the first wagons appear. People were buried on their back with their legs flexed, a position which remained typical for the Indo-Europeans for a very long time (see ills. 12a and 12b). The burials were covered with a mound, a *kurgan*.
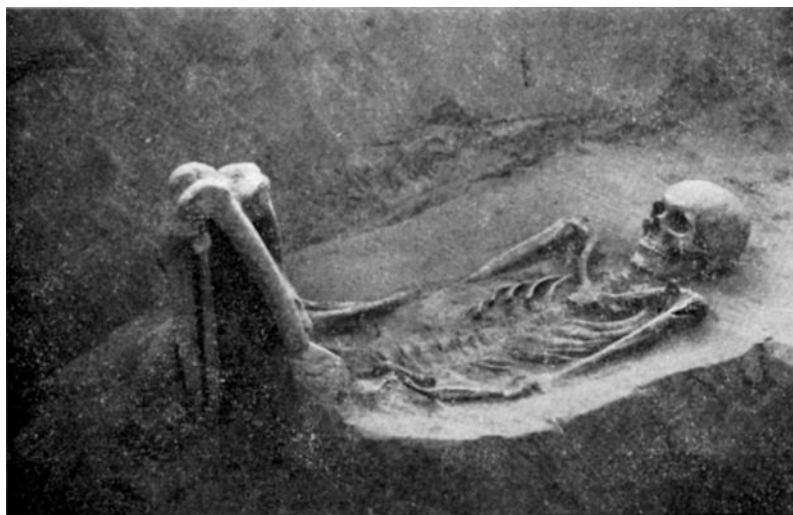
Map 12a. An Indo-European burial — A burial with the dead with flexed legs, a position which remained typical for the Indo-Europeans for a very long time. This burial belongs to the first expansion wave of the Indo-Europeans, along the Danube to Hungary. Often the legs later fell to one side. From I. Ecsedy, *The people of the Pit-Grave Kurgans in Eastern Hungary*, Budapest 1970, 71.
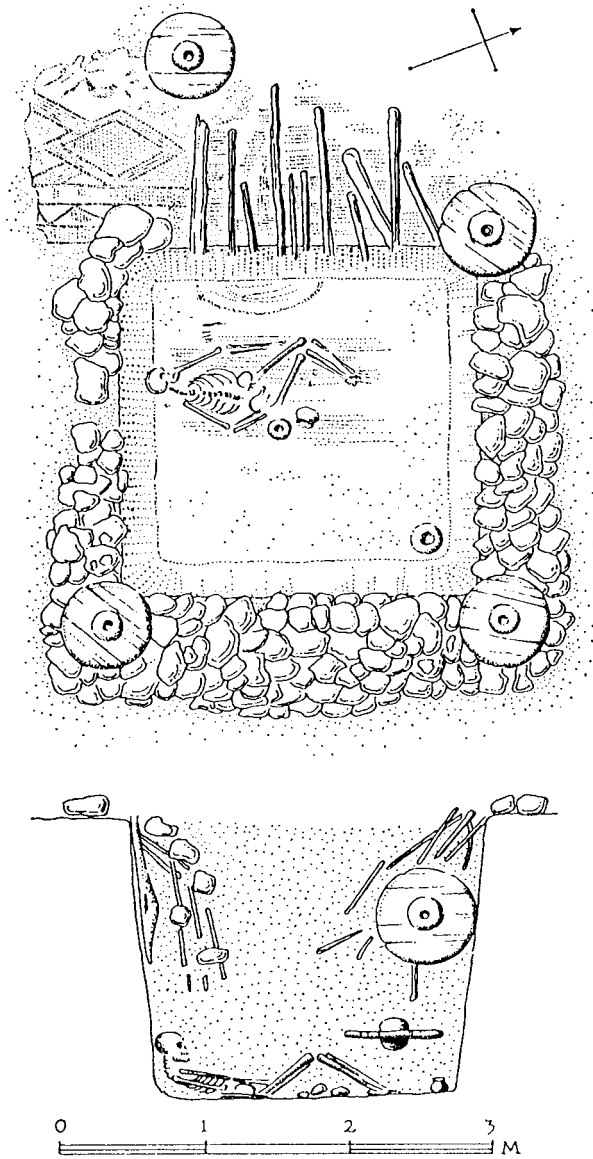
Map 12b. Wheels in the Yamnaya (Pit Grave) culture. — During this culture the first evidence for wagons and cars appears. This is a burial from Tri Brata, in the area between the Don and the Volga. It contains no less than six wheels and thus provides evidence for the use of cars. The wheels are of the tripartite type, i.e. each is made of three pieces of wood. These 'solid' wheels antedate the spoked wheels, which are a much later development. Note further that the deceased is buried with the knees drawn upward, as was characteristic of the Indo-Europeans. 3rd millennium B.C., Pit Grave culture. From Stuart Piggott, *The earliest Wheeled Transport*, London, 1983, 55.

The Globular Amphorea Culture
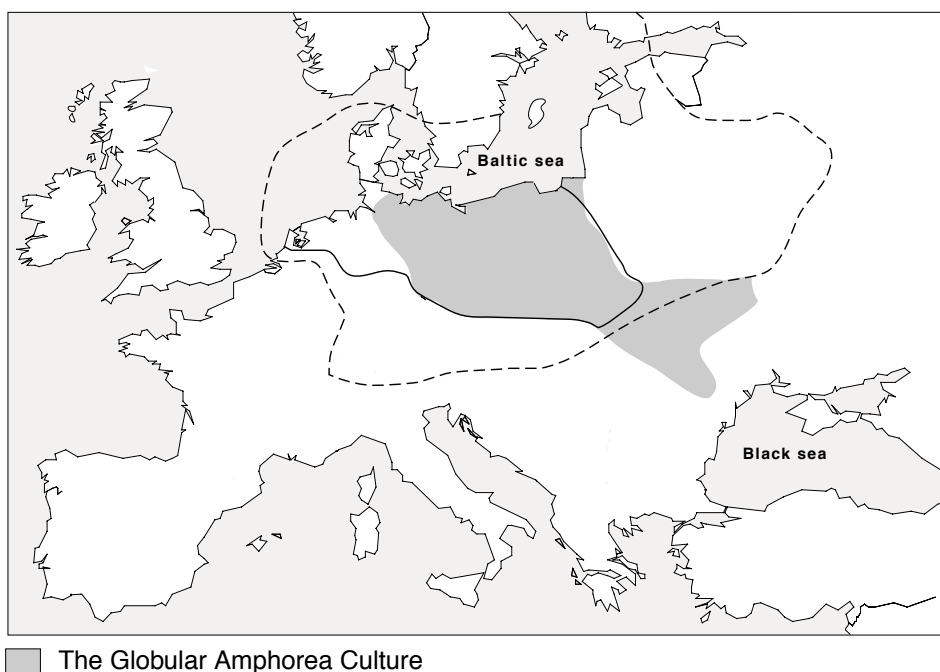
Map 13. The Corded Ware complex — This complex of cultures (among them the Battle-Axe cultures) probably represents the arrival of the first Indo-Europeans in central Europe (outer line). It dates from about 3000–2000. The Globular Amphorae culture (the grey area) may be slightly earlier, but the relation between these two cultures is not quite clear. The inner line indicates the preceding, non-Indo-European Funnel-Beaker culture (in German called: Trichterbecherkultur).

Map 14. The first Indo-Europeans in Asia — The Tocharians, in Xinjiang, may be a continuation of the Afanasievo culture (3000–2000), to the north-east of their later territory, from the upper Yenisei up to the Altai mountains (not shown on the map). — The Indo-Iranians are probably found in the Andronovo culture, round the Aral Sea. They probably destroyed the Indus civilization (2500–1500), with its large cities like Mohenjo Daro and Harappa. We can follow the Indo-Aryans through the Gandhara Grave culture (since 1800), the Cemetery H culture in the Punjab, where the Rigveda originated, and the Painted Gray Ware (1300–400) from the Punjab to the Ganges. Indo-Aryans are also found far west among the rulers of the Mitanni (who were themselves Hurrians) in the 15th century B.C. — In Iran the Gorgan culture has been assumed to be of Indo-Iranian origin, but its early date (3000–2250) creates difficulties. Only since the Iron Age I culture (1400–800) a continuous development can be shown here. — The Timber Grave (or Srubnaya) culture is the successor to the Yamnaya culture.

Illustrations

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१ यो जा॒त ए॒व प्र॒थ॒मो मन॑स्वान्
देवो॒ देवा॒न्क्रतुना पर्य॑भूषत् ।
यस्य॒ शुष्मा॒द्रोद॑सी॒ अभ्य॑सेतां
नृ॒म्ण॒स्य म॒ह्ना स जना॑स॒ इन्द्र॑: ॥

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य॒: । जा॒त: । ए॒व । प्र॒थ॒म: । मन॑स्वान् ।
देव॑: । देवा॑न् । क्रतुना । परि॑ऽअभूषत् ।
यस्य॑ । शुष्मा॑त् । रोद॑सी॒ इति॑ । अभ्य॑से-
ताम् ।
नृ॒म्ण॒स्य॑ । म॒ह्ना । स: । ज॒ना॒स॑: । इन्द्र॑: ॥

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1   yó jātá evá prathamó mánasvān
     devó deván krátunā paryabhūṣat;
     yásya śúṣmād ródasī ábhyasetāṃ
     nṛmṇásya mahná: sá, janāsa, Índraḥ.

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*The chief wise god who as soon as born surpassed
the gods in power; before whose vehemence the two
worlds trembled by reason of the greatness of his
valour: he, o men, is Indra.*

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Illustration 1.   Sanskrit, devanāgarī-script. — A strophe from the Rigveda (II 12,1). Indra is one of
the principal deities of the Indian pantheon. He killed the demon Vrtra, who withheld the life-giving
waters of heaven. With 'both worlds' (the dual *ródasī*) heaven and earth are meant. The verse is the
triṣṭubh, which has the following structure:
    - - ˘ - - | ˘ ˘, - ˘ - - (lines a and d)
    - - - - | - ˘ ˘, - ˘ - - (b and c)
(| indicates the caesura; , indicates the beginning of the cadence)

Illustration 2. Avestan script, to be read from right to left. A passage from the Gatha-Avesta of Zarathustra. The first strophe (three lines; Yasna 30,2) reads:

> *sraotā gəušāiš vahistā \ auuaēnatā sūcā manaŋhā*
> *āuuarənå viciϑahiiā \ narām narəm xᵛax̌iiāi tanuiiē*
> *parā mazā yåŋho \ ahmāi [nā] sazdiiā baodaṇtō paitī*

'Listen with your ears to the best things, | reflect with a clear mind upon the two choices of decision | — man by man for himself — before the great retribution, | caring to declare yourselves to Him.' (after S. Insler, *The Gāthās of Zarathustra*, Leiden 1975)
The translation is in details doubtful. Zarathustra emphasized that man had to choose the side of Ahuramazda in the continuous struggle against evil. (The word *nā* was incorrectly introduced in the text from other passages.)
Each verse consists of 7 + 9 syllables in the original metre.

Illustration 3. Old Persian cuneiform writing — The inscription from Behistun (Bīsotūn, ancient Bagastāna 'Place of the Gods'), south of Hamadān (ancient Ecbatana), some 50 metres high on the rock. In it king Darius relates how he took over the throne from a usurper, in 521 B.C., and crushed rebellions that broke out in various parts of the empire. The relief (shown in part) shows Darius (left) before the defeated chained rebels. Above right is Ahuramazda. The inscription proper is below the relief, in Old Persian, in Akkadian and in Elamite. The inscription is said to be the largest in the world, the transcription of the Old Persian text alone being nine pages in print.
From W. Hinz, *Darius und die Perser*, Baden-Baden 1976, 146; a photograph of L. Trümpelmann.
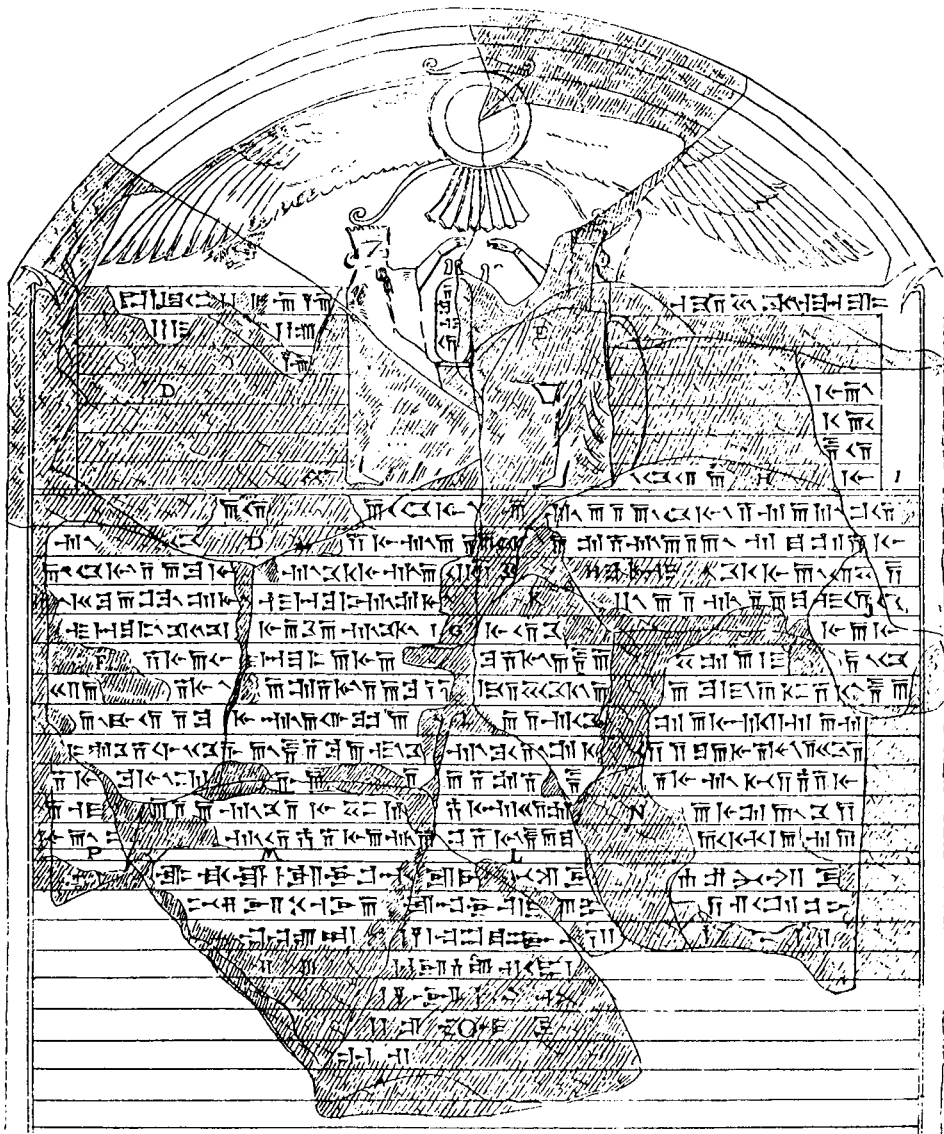
Illustration 4. Old Persian cuneiform writing. — A stela of king Darius from Egypt in which he reports about the construction of the Suez-canal. The king is shown twice, adoring Ahuramazda (the symbol at the top). The last seven lines give the translation in Elamitic. The back of the stela gives the text in Egyptian, in hieroglyphs. The last section of the text says: 'I ordered to dig this canal from the river called Nile which flows in Egypt toward the sea that comes from Persia. Upon that this canal was dug thus as I ordered it, and ships came through this canal to Persia thus as was my wish.'
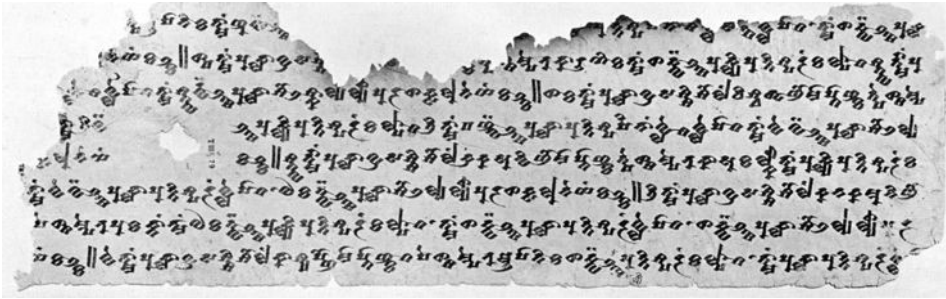
Illustration 5. Tocharian. — Most manuscripts date from the sixth to eighth centuries A.D. from the Chinese province of Xinjiang. The script is a form of the North Indian Brahmi-script. The picture shows a text in Tocharian A from Turfan, with a fragment from the Maitreyasamiti. The top has been damaged by fire. This ms. was transcribed in the 1908 article by E. Sieg and W. Siegling in which they showed the IE character of Tocharian ('Tocharisch, die Sprache der Indoskythen', *Sitzungsberichte der Königlich Preußischen Akademie der Wissenschaften*, 1908, 915–934).

Illustration 6. Armenian — The Armenian script is said to have been devised by bishop Mešrop in A.D. 402, on the basis of the Greek script. The text (in East Armenian) is John 3.16:

> *Orovhetew Astowac aynpēs sirecʻ ašxarhkʻə or ir miacin Ordin towaw, or amen noran hawa-tacʻołə čʻkorši* (read *čʻkorčʻi*), *ayl yawitenakan keankʻn ownenay.*

Translated literally: "Because God so-much loved the-world, that his only-born son he-gave, so-that every-one in-him believ-ing not be-lost, but eternal life has."
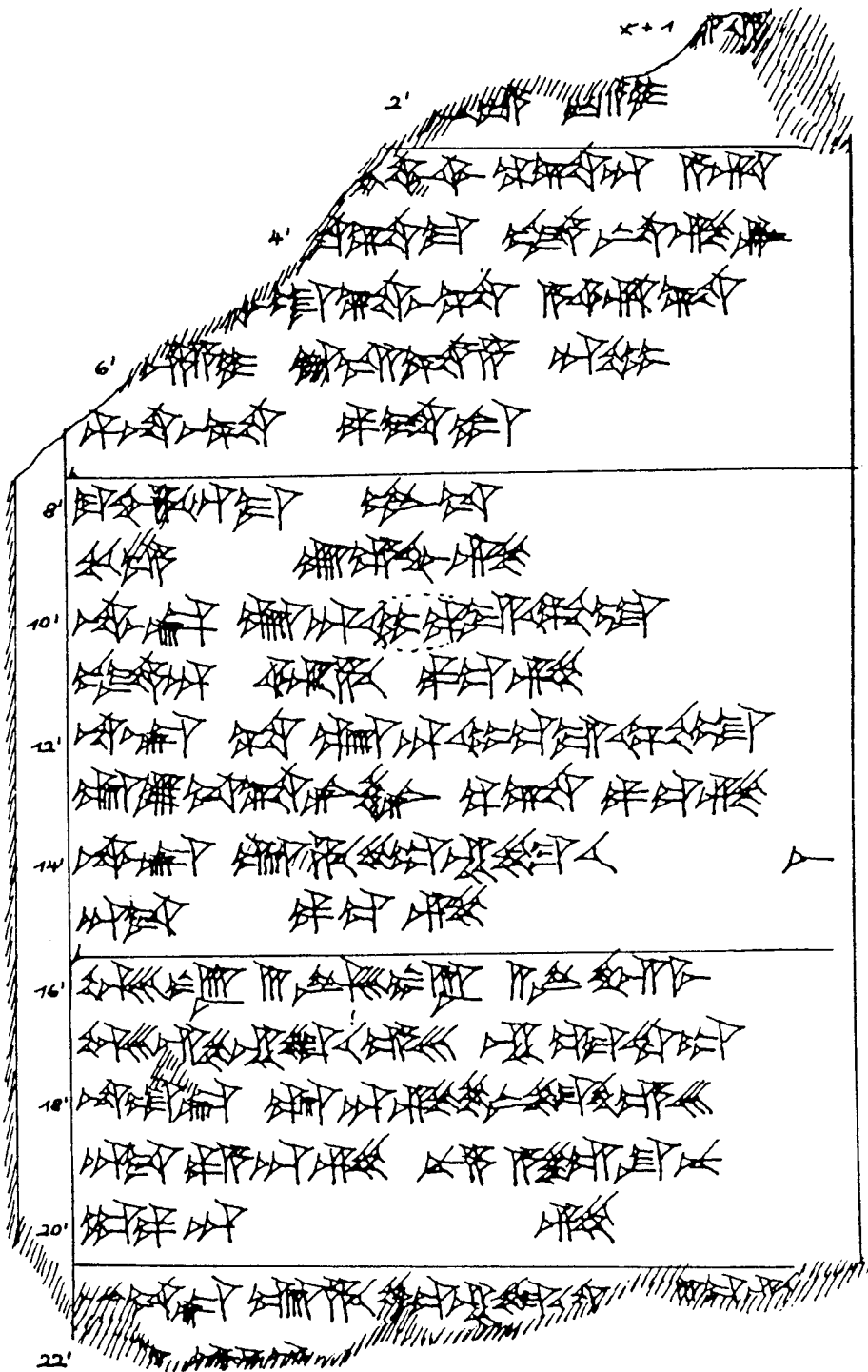
Illustration 7. Hittite clay tablet, with cuneiform writing, found in Boghazköy, the old capital Hattusas. The text gives a ritual to be carried out by the king. Line 8ff. runs:

(8) *ma-ah-ha-an-ma* LUGAL-*us*
(9) KUR-*e ú-e-eh-zi*
(10) *na-as-kan* É ^D*mi-iz-zu-ul-la*
(11) EGIR-*an ar-ha pa-iz-zi*

"When the king
goes through the country
then the house (temple) of (the God) Mizzulla
he enters again."

(The words in capitals are Sumerian ideograms.)
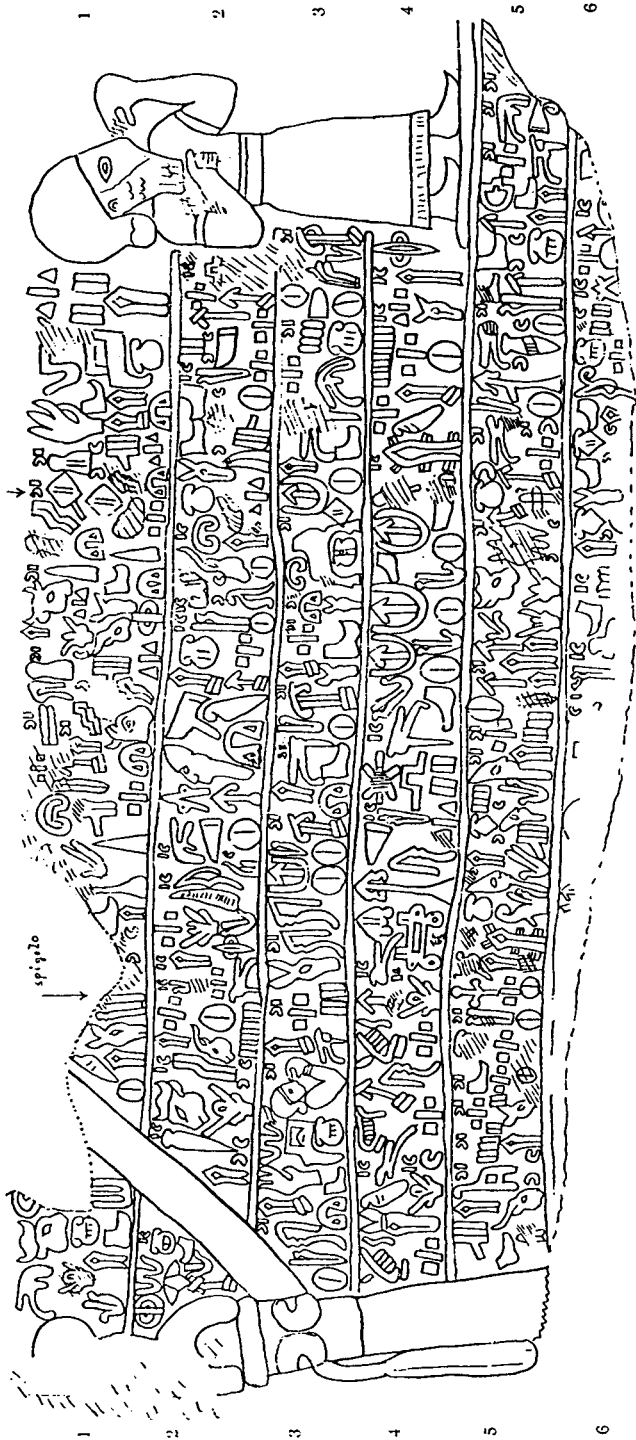
Illustration 8. Hieroglyphic Luwian — An inscription in Luwian hieroglyphs. It is a proclamatian of king Halparuntiya, king of Gurgum (present-day Maraş in South-East Turkey) from ca. 850 B.C. The first horizontal band must be read from right to left, the second from left to right, the third from right to left, etc. Within each band, the separate signs must be read from the top downward. The script uses phonetic as well as logographic signs, which are transliterated in Latin. The figure of the king must be read as the logogram EGO 'I'.

REX	*i ní*	*ku+ra/i*	IUDEX	CERVUS$_2$	TONITRUS	*wa/i*	
ti	*sa*	*ku*	*ní* *tara/i*	*ti*	HALPA	*mi*	EGO
sa	URBS	*ma*	*sa* *wa/i*	*ia* *i*	*pa*	*i*	
		wa/i		*sa*			

This makes: EGO-*wa/i-mi-i* TONITRUS.HALPA-*pa*-CERVUS$_2$-*ti-i-ia-sa*^{"IUDEX"}*tara/i-wa/i-ní-sa ku+ra/i-ku-ma-wa/i-ní-i-sa*^{URBS} REX-*ti-sa*, which stands for phonetic *amu=wa=mi Halparuntiyas tarwanis kurkumawanis hantawatis* 'I am Halparuntiya, the Ruler, Gurgumean king'.
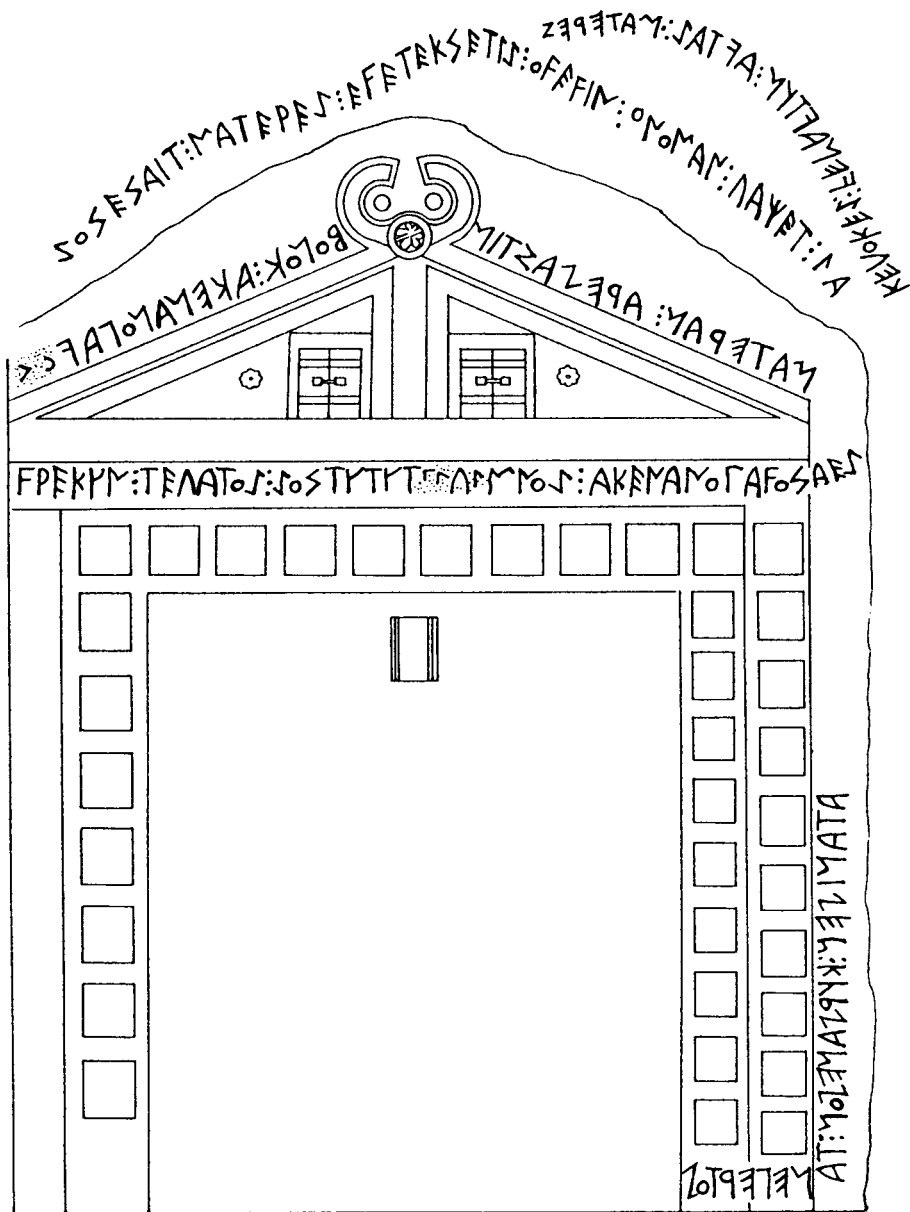
Illustration 9. An inscription in Old Phrygian on a façade cut in the rock. The inscription probably dates from the sixth century B.C. The text begins at the right corner of the triangular tympanon (running upwards to the left) with: *materan areyastin*, 'Mother Areyastis' (in the accusative), a name of the goddess Cybele. Note that the letters themselves have been turned from right to left when the line runs from right to left.
(Drawing made by Mrs. T. Wezels-Ignova, taken from *Kadmos* 27, 1988, 10.)

[Old Church Slavonic text in glagolitic script — John 4, 5ff, numbered verses 6 through 16]

Illustration 10. Old Church Slavonic in glagolitic script — Old Church Slavonic is handed down in two writing systems, glagolitic (from *glagolъ* 'word') and Cyrillic. The older one, glagolitic, was designed by the apostle of the Slavs, Cyrillus, about 863. It was soon replaced by Cyrillic, which is now used for Russian and Bulgarian. This alphabet originated at the end of the ninth or the beginning of the tenth century and derives mainly from uncial writing. The origin of the glagolitic system is still disputed.

The text (John 4, 5ff) begins as follows: *Vъ ono* [*vrěmę*] *vънide isousъ vъ gradъ samarenskъ naricaemъi soucharъ iskrъ vъsi, jože dastъ iakovъ iosifou sъinou svoemou* — "At that [time] Jesus came in a town of Samaria, named Souchar, near the place which Jacob had given to his son Joseph."

Прорись грамоты № 138

Illustration 11. Old Russian text written on birch bark, from the beginning of the 14th century, excavated in Novgorod. It treats the receipt of money and goods. This is the beginning: *se azo rabo božii Selivьstro napsaxъ roukopisanije* — 'Herewith (it is declared that) I, servant of God Selivestr, have written this document.'
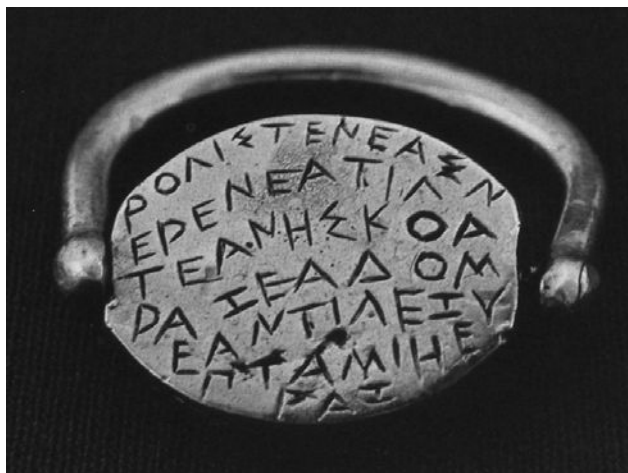
Illustration 12. Thracian — The gold ring with inscription from Ezerovo, dating from the fifth century B.C. It is one of the two inscriptions we have in Thracian. The text is not understood. It runs: *rolisteneasn ereneatil teanēskoa razeadom eantilezy ptamiēe raz ēlta.*
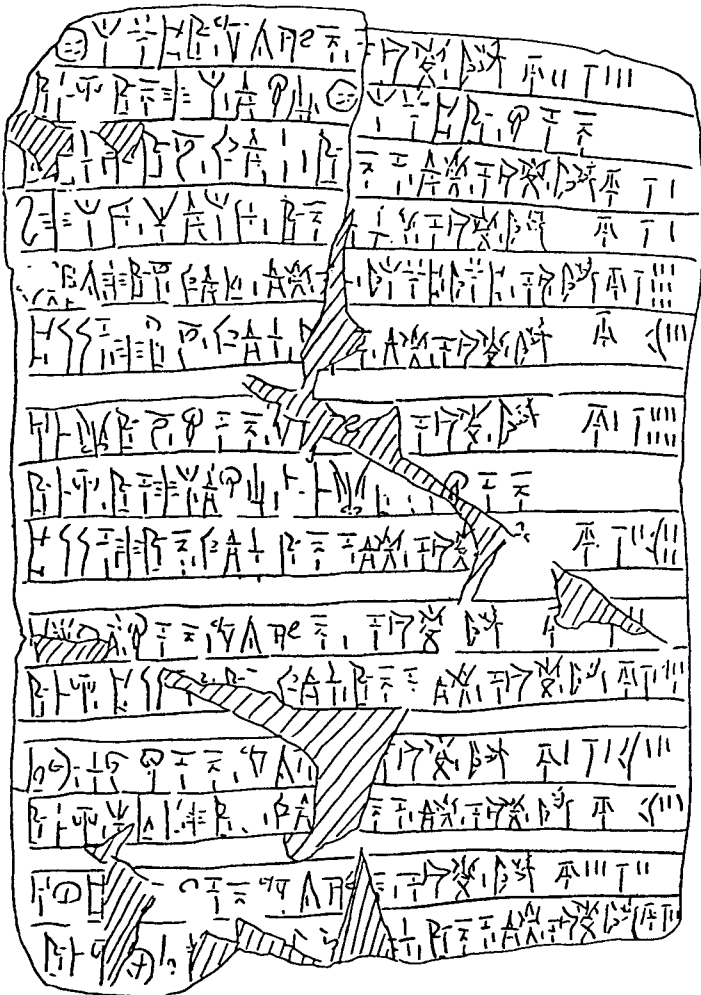
En 659

Ad 666
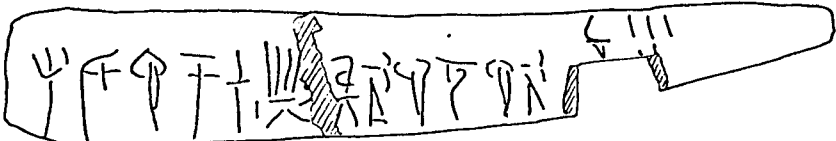
Ad 669

Illustration 13. Mycenaean clay tablets, two in the shape of palm leaves. They are written in the Linear B script, and originate from Pylos. The big one (En 659) registrates quantities of seed distributed per land. The first line has:

> *qe-re-qo-ta-o ki-ti-me-na to-so-de pe-mo* WHEAT 2 T 3
> 'The land of Kʷerekʷotās, so much seed: WHEAT 2 T 3'

Tablet Ad 666 says:

> *pu-ro a-ke-ti-rja-o ko-wo* MAN 20 *ko-wo* 7
> *Pulōi (?)askētriāōn korwoi* MAN 20 *korwoi* 7
> 'In Pylos, children of the …sters, 20 men, 7 boys'

τοῖσι δὲ καὶ μετέειπεν ἄναξ ἀνδρῶν Ἀγαμέμνων,
αὐτόθεν ἐξ ἕδρης, οὐδ' ἐν μέσσοισιν, ἀναστάς·
   „ὦ φίλοι! ἥρωες Δαναοί! θεράποντες Ἄρηος!
ἑσταότος μὲν καλὸν ἀκούειν, οὐδὲ ἔοικεν
ὑββάλλειν! χαλεπὸν γάρ, ἐπισταμένῳ περ ἐόντι.
ἀνδρῶν δ' ἐν πολλῷ ὁμάδῳ πῶς κέν τις ἀκούσαι
ἢ εἴποι; βλάβεται δὲ λιγύς περ ἐὼν ἀγορητής! —
Πηλείδῃ μὲν ἐγὼν ἐνδείξομαι· αὐτὰρ οἱ ἄλλοι
σύνθεσθ', Ἀγρεῖοι, μῦθόν τ' εὖ γνῶτε ἕκαστος!
πολλάκι δή μοι τοῦτον Ἀχαιοὶ μῦθον ἔειπον,
καί τέ με νεικείεσκον· ἐγὼ δ' οὐκ αἴτιός εἰμι,
ἀλλὰ Ζεύς, καὶ Μοῖρα, καὶ ἠεροφοῖτις Ἐρινύς,
οἵ τέ μοι εἰν ἀγορῇ φρεσὶν ἔμβαλον ἄγριον ἄτην
ἤματι τῷ, ὅτ' Ἀχιλλῆος γέρας αὐτὸς ἀπηύρων...
ἀλλὰ τί κεν ῥέξαιμι; θεὸς διὰ πάντα τελευτᾷ!...
πρέσβα Διὸς θυγάτηρ Ἄτη, ἣ πάντας ἀᾶται, —
οὐλομένη! τῇ μέν θ' ἁπαλοὶ πόδες· οὐ γὰρ ἐπ' οὔδει
πίλναται, ἀλλ' ἄρα ἥ γε κατ' ἀνδρῶν κράατα βαίνει
βλάπτουσ' ἀνθρώπους· κατὰ δ' οὖν ἕτερόν γ' ἐπέδησε!
καὶ γὰρ δή νύ ποτε Ζῆν' ἄσατο, τόν περ ἄριστον
ἀνδρῶν ἠδὲ θεῶν φάσ' ἔμμεναι! ἀλλ' ἄρα καὶ τὸν
Ἥρη, θῆλυς ἐοῦσα, δολοφροσύνης ἀπάτησεν
ἤματι τῷ, ὅτ' ἔμελλε βίην Ἡρακληείην
Ἀλκμήνη τέξεσθαι ἐυστεφάνῳ ἐνὶ Θήβῃ.
ἤτοι ὅ γ' εὐχόμενος μετέφη πάντεσσι θεοῖσι·

Illustration 14. Greek. Manuscript page (above) with a passage from Homer's Iliad (T 76ff). This is one of the oldest manuscripts, from the tenth century, called the Venetus 454, one of our best sources of the Iliad. It is written in a careful, flowing minuscule. Around it is a commentary (scholion) from antiquity (not shown here), which gives us much information. To the right is the same passage in a modern edition. The begin of the text reads: 'To them spoke the lord of men, Agamemnon, directly rising from his seat, not (standing) in the middle (of the assembly): "O friends, heroic Danaoi, servants of Ares."'
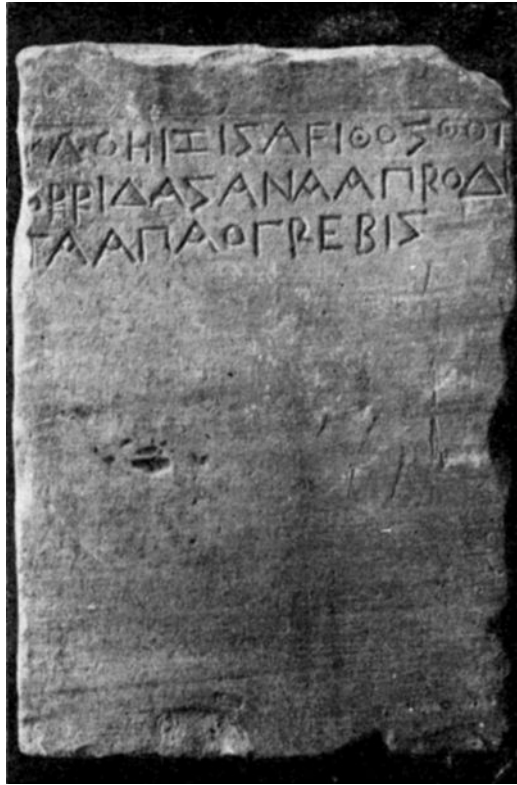
Illustration 15. Messapian inscription, from Galatina, second century B.C. Messapian was an independent Indo-European language (perhaps related to Illyrian — of which we have no texts). The text says:

klohi zis aviθos θotorridas ana aprodita apa ogrebis (but the separation of the words is uncertain!). It cannot be translated. *klohi* may be 'listen!', *aprodita* is of course a loanword from Aphrodite.

Illustration 16. The oldest inscription but one in Latin, or rather a closely related dialect, from ca. 500 B.C. It was found reused in the basis of a temple in Satricum, to the south of Rome. The text says (word end indicated where it may be considered certain):

eisteterai popliosio valesiosio / suodales mamartei
'…placed(?) of Poplios Valesios / the followers for Mamars.'

Poplios Valesios agrees with Lat. Publius Valerius; Mamars is the god Mars.

CLAVERNIVR·DIRSAS·HERTI·FRATRVS·ATIERSIR·POSTI·ACNV
    FARER·OPETER·P·IIII·AGRE·TL·ATIE·PIQ·VIER·MARTIER·ET·SESNA
    HOMONVS·DVIR·PVRI·FAR·EISC·VRENT·OTE·A·VI·   CLAVERNI
    DIRSANS·HERTI·FRAT·ER·ATIERSIVR·SEHMENIER·DEQVRIER   R
    PELMNER·SORSER·POSTIACNV·VEF·X· CABRINER·VEF· V· PRETA
    TOCO·POSTR·AFAHE· EF·SESNA·OTE·A·VI· CASILOS·DIRSA·HERTI·FRATRVS
    ATIER·SIR·POSTI·ACNV·FARER·OPETER· P·VI· AGRE·CASILER·PIQVIER
    MATIER· ET· SESNA·HOMONVS·DVIR· PVRI·FAR·EISC·VRENT·OTE·A·VI
    CASILATE·DIR·SANS·HERTI·FRATE·ER· ATIER·SIVR· SEHMENIER·DEQVRIER
    PELMNER·SORSER·POSTIACNV·VEF· XV· CABRINER· VEF· VIIS ET
    SESNA· OTE· A·VI

Illustration 17. Umbrian. Plate Vb of the Tabulae Iguvinae, large bronze tables found in Iguvium (now Gubbio). They describe a ritual of a religious brotherhood, the fratres Atiedii (line 4–5 *fratru / atiieŕiu*; note 8 = *ƒ*). The upper part is in the national alphabet, which was derived from the Etruscan alphabet. The lower part, in Latin script, was added later.

Illustration 18. South Picene — The inscription from Penna Sant' Andrea from the fifth century B.C. Few inscriptions are known in this language, but it is the oldest of the Italic languages beside Latin. — The text mentions *safinas tútas*, 'the Sabine people'.
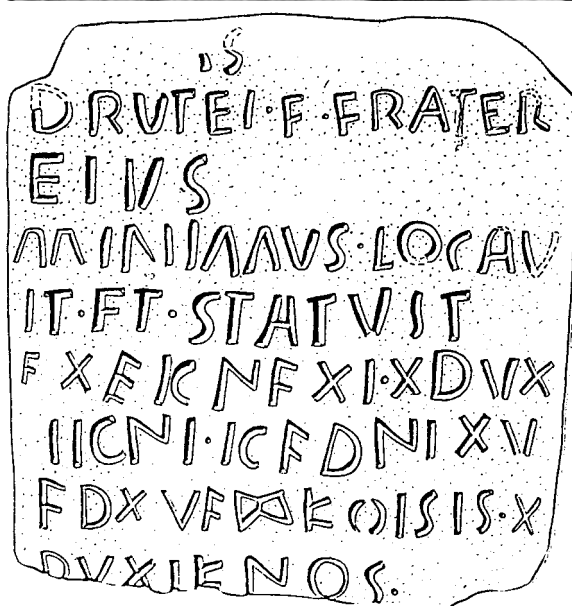
Illustration 19. A Gaulish inscription. — The inscription from Todi, in Umbria, Italy. It is a bilingual text, presenting a Latin and a Gaulish version, on both sides. The Latin text runs: *[coisi]s druteif. frater eius minimus locavit et statuit* 'Coisis, son of Drutos, his youngest brother, placed and erected (this tomb).' In Gaulish, in a North Italic alphabet, it says: *ateknati truti[i]kni karnitu artuaś koisis trutiknos*, i.e. '(The tomb of) Ategnatos, (son) of Drutos. Koisis, (son) of Drutos, erected the *artua's.*' From W. Meid, *Gaulish Inscriptions*, Budapest 1992, p15

Illustration 20. The first Celtiberian inscription from Botorrita, near Zaragoza (Spain), found in 1970; this is the front side. It is written on a piece of bronze, 40 x 10 cm., on both sides. It probably dates from about 150 B.C. The script is the semi-alphabetic (partly syllabic) Iberian script. The language is not well known and much remains unclear in the text. It probably contains regulations regarding the use of a piece of land.
From W. Meid, *Die erste Botorrita-Inschrift*, Innsbruck 1993, p. 134, 141
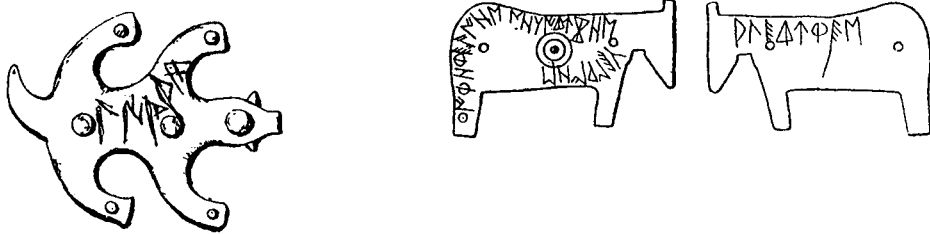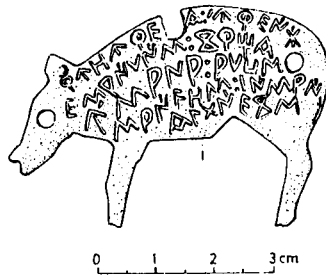
Illustration 21. Celtiberian inscriptions on three 'tesserae', used in order to identify the bearer as being entitled to receive the hospitality of a family or a town. The texts are written in the Iberian script (which is partly a syllabic script) and date from about the first century B.C. — The upper one mentions (third line, first word, from left) *uśama*, the town (Lat.) Uxama, now Osma, west of Soria.

D   O   F   E T   I   M A   Q   Q   I   C   AT   T   I   N   I
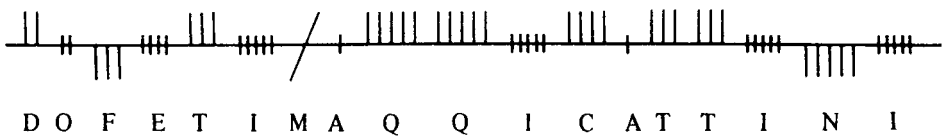
Illustration 22. Old Irish inscription, from Cornwall, in Ogham script. This script consisted of strokes on both sides of the edge of a stone. It was used at least since the fourth century A.D. The text gives: *Dofeti maqqi Cattini* — '(Stone) of Dovetos son of Cattinos'. *maqqi* is the genitive of the word for 'son' that is seen in many Irish names, like Mac Arthur. The genitive ending *-i* in Irish is the same as that in Latin (e.g. *domini*). In later Old Irish as found in the oldest manuscripts the *-i* has disappeared, and *maqqi* has become *maic*.

Illustration 23. Old Irish manuscript, from the Book of Leinster, from ca. 1160. The text is from the story of 'Mac Da Thó's pig'. Two heroes are going to fight for the honour of dividing the pig. They salute each other with a poem, line 9ff. (note the allitteration, c-… c-, also c[h]…c-, e-…e-): *Fochen Cet, Cet mac Mágach, magen c[h]urad, cride n-ega, eithre n-ela, eirr trén tressa, trethan ágach, caín tarb tnúthach, Cet mac Mágach* — 'Welcome Cet, Cet son of Mágu, house of a hero, heart of ice, quill-feather of a swan, fierce fighter in battle, martial soaring sea, beautiful angry bull, Cet son of Mágu.' — (In line 9 *mátach* is a mistake for *mágach*.)

f	u	th	a	r	k	g	w
fehu	*ūruz*	*þurisaz*	*ansuz*	*raidō*	*kaunan?*	*gebō*	*wunjō?*
cattle	*aurochs*	*giant*	*ase*	*ride,*	*oath*	*gift*	*bliss*
			wagon				

h	n	i	j	ei	p	z(R)	s
hagla-	*naudiz*	*eisaz?,īsaz*	*jēran*	*ī(h)waz*	*perþō*	*algiz?*	*sōwelō*
hail	*need*	*ice*	*year*	*yew*	*?*	*elk*	*sun*

t	b	e	m	i	ng	d	o
teiwaz, tīwaz	*berkanan*	*ehwaz*	*mannaz*	*laukaz*	*ingwaz*	*dagaz*	*ōþala, ōþila*
sky god, tyr	*birch,*	*horse*	*man*	*leek*	*fertility*	*day*	*inheritance*
	twig				*god*		

Illustration 24. The Germanic runes, with their reconstructed names. This script is called the 'futhark', after the first letters. Some signs were taken from the Latin alphabet, others from scripts derived from the Etruscan one. The oldest runes date to the second century A.D.

𐌰	𐌱	𐌲	𐌳	𐌴	𐌿	𐌶	𐌷	𐍈
1	2	3	4	5	6	7	8	9
a	*b*	*c*	*d*	*e*	*q*	*z*	*h*	*þ*

𐌹 ï	𐌺	𐌻	𐌼	𐌽	𐌾	𐌿	𐍀	𐍁
10	20	30	40	50	60	70	80	90
i	*k*	*l*	*m*	*n*	*j*	*u*	*p*	—

𐌺	𐍃	𐍄	𐍅	𐍆	𐍇	𐌷	𐍉	↑
100	200	300	400	500	600	700	800	900
r	*s*	*t*	*w*	*f*	*x*	*h*	*o*	—

Illustration 25. The Gothic alphabet. It is largely based on the Greek alphabet, but *h*, *r* and *s* are taken from Latin, while *þ*, *j*, *u* and *f* were taken over from the runes. The signs for 90 and 900 are of Greek origin.

Indexes

1.   English

An index of English words of which the etymology is discussed (for Old and Middle English see index 3.6.)

2. Proto-Indo-European

An index of the English meaning of words for which the Proto-Indo-European form has been reconstructed.

3.   The Indo-European Languages

For the alphabetical order the accents and other diacritics have been disregarded, except that *š* and *ś* follow *s*, and *ž* follows *z*; *æ* follows *a*, and in Sanskrit *ā* is put after *a*. The *ə* is placed after *e*; *ϑ* and *þ* follow *t*. In Slavic *ь* follows *i*, and *ъ* follows *u*. The numerals on p. 238–239 have not been included.

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4. Non-Indo-European Languages