Comparative Indo-European Linguistics
Comparative Indo-European Linguistics
An introduction
Second edition

Robert S.P. Beekes

Revised and corrected by
Michiel de Vaan

John Benjamins Publishing Company
Amsterdam / Philadelphia
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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 (1.) 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.

Robert S.P. Beekes
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

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

Other abbreviations
abl.  ablative
acc.  accusative
act.  active
adj.  adjective
adv.  adverb
anal.  analogy, analogically
aor.  aorist
AP  accent paradigm
cf.  compare
cons.  consonant
dat.  dative
dem.  demonstrative
du.  dual
f(em).  feminine
fut.  future
gen.  genitive
ib(id).  in the same place
id.  idem
ill.  illustration
imf.  imperfect
imp.  imperative
ind.  indicative
inf.  infinitive
inj.  injunctive
ins(tr).  instrumental case
intrans.  intransitive
loc.  locative
m(asc).  masculine
med.  medium, middle
nom.  nominative
n(tr).  neuter
opt.  optative
pass.  passive
pf.  perfect
pl.  plural (1 pl., 2 pl., 3 pl. = 1st, 2nd, 3rd person plural)
ppf.  pluperfect
pr(es).  present tense
pret.  preterite
ptc.  participle
RV  Rigveda
sg.  singular (1 sg., 2 sg., 3 sg. = 1st, 2nd, 3rd person singular)
subj.  subjunctive
subst.  substantive
trans.  transitive
vb.  verb
voc.  vocative
>
<  
*  (before a word) reconstructed form
-  long vowel
-  short vowel
Ø  zero
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: t etc. are retroflexes; c = [ts], j = [dž]; ŝ (formerly č) = ĝ; -h is a voiceless h; r̄ is vocalic r; m or ň: nasalization of the preceding vowel. e and o are long vowels, ai and au are long diphthongs.

Avestan: q nasalized a; ā as in broad, x as ch in Scottish Loch, ř = [ŋ]; β, δ, ϱ voiced fricatives; c, j (formerly č, j) as in Sanskrit; ň, ě, ě palatalized n, ŏ, x; -t is an unreleased (i.e., the first part of) t; y and v are written Ź and ũu word-internally.

Old Persian: c, j, see Sanskrit; ř also ě = [ŋ]; x (also Ź) as in Avestan; č maybe as Czech ř.

Old Church Slavonic: ě = [ě]; ě, ō nasalized e, o; õ, ŏ as in pit, cut; ĉ = [ĉ], ě = [ĉ], x see Avestan.

Lithuanian: ē long, closed e; ė, q, long āe, a; y = ĭ; ie formerly ē, uo formerly ũ; ŕ formerly sz, ě formerly cz.

Armenian: p’ etc. = [ph]; c = [ts], j = [dž], c’ = [tš] (formerly č), ě = [tš], j = [dž], ě’ = [tšḥ] (formerly č’); ř = rr (formerly ř).

Albanian: ĕ = [a], y = [ü]; th = [ŋ], dh = [ð]; c = [ts], x = [dž]; ě = [tš], xh = [dž]; q = [c], a voiceless palato-alveolar stop, gj = its voiced counterpart.

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

Tocharian: a = [a], ā = [a], ä = [r]; further as Sanskrit.

Old Irish: c = [k], ā etc. long a; iC = C’ (palatalized consonant).

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

Gothic: ei = ĭ; ai, au (also ai, au) = [e, ē] before r, h, hw; hw = [xw].
## List of Exercises

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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 patér. 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:

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, Tigrinya, Harari and Gurage.

(b) Old Egyptian forms a distinct branch of its own. Coptic, which only survives as a liturgical 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.
4. The Cushitic languages spoken in the horn of Africa, such as Somali and Oromo, and

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

6. 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-Penutian*; 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-Aztecan* 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 (Otomí, 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, i and u 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:

<table>
<thead>
<tr>
<th>Sanskrit:</th>
<th>Latin</th>
<th>Greek</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>devah</td>
<td>‘god’</td>
<td>deus</td>
<td>theós</td>
</tr>
<tr>
<td>padam</td>
<td>‘foot’</td>
<td>pes, ped-is</td>
<td>poús, pod-ós</td>
</tr>
<tr>
<td>maha</td>
<td>‘great’</td>
<td>mégas</td>
<td></td>
</tr>
<tr>
<td>viduva</td>
<td>‘widow’</td>
<td>vidua</td>
<td></td>
</tr>
</tbody>
</table>

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. Coeurdoux 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 *η-, which became *un- in Germanic and still is un- in English. Let us now examine the declension of the verb ‘to be’:

<table>
<thead>
<tr>
<th>Sanskrit.</th>
<th>Latin</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>as-mi</td>
<td>*s-*um</td>
<td>‘I am’</td>
</tr>
<tr>
<td>as-i</td>
<td><em>es</em></td>
<td>‘you are’</td>
</tr>
<tr>
<td>as-ti</td>
<td><em>es-t</em></td>
<td>‘he is’</td>
</tr>
<tr>
<td>s-mas</td>
<td>*s-*umus</td>
<td>‘we are’</td>
</tr>
<tr>
<td>s-tha</td>
<td><em>es-tis</em></td>
<td>‘you are’</td>
</tr>
<tr>
<td>s-anti</td>
<td>*s-*unt</td>
<td>‘they are’</td>
</tr>
</tbody>
</table>

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 San-
skrit 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 declen-
sion (parentheses indicate uncertainty) in the left-hand column:

(V)s-(V)m(i)  *h₁ès -mi
Vs-(i)        *h₁ès -si
Vs-t(i)       *h₁ès-ti
s-(V)mVs      *h₁š-més
(V)s-t(h)V    *h₁š-th₁é
s-Vnt(i)      *h₁š-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 follow-
ing. 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. géneos '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 (samskṛtam, '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 (rg- '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 (Hamadān), 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 Kučä 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 Palâ, which may have to be situated to the northeast 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’ Cyril 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 glagol ‘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 Ezeroovo, 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 Dорians.

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 liturgical 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. (III. 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. (III. 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-Romani], 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 Goîdel, 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) (III. 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 (III. 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 *Egíls saga* 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 *teutâ ‘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):


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 (k̂, ș, ž) 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. *satam* (Skt. *śatām*), both from PIE *dʰkmtóm*; the k̂ 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,
-bhíṣ), but which in Germanic and Balto-Slavic began with an m (OCS -m̥, -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 (*-bhí), 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 compar-
sions are very convincing: for example, Finnish vesi, gen. veden ‘water’, PIE *uodr, gen.
*udens; Finnish nimi, gen. nimen ‘name’, PIE *h₂neh₂mn, Skt. náma. 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 inflex-
ional morphemes for a common prestige 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
alogical 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
Ilič-Svityč had worked out in great detail the exact development of the sounds. Ac-
cording 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 Cauca-
sian 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 reconstruct 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 coinciden-
tal and cannot all be explained from borrowing (although that is partly a matter of
taste), several comparatists agree on a Eurasian 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 Eurasian family would then form Nostratic. Some also include Af-
roasiatic, 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 popu-
larized 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)H- (Skt. púr, Lith. pilis, 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 *tük- (Lat. vicus, 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 *döm (Arm. tun, Gr. do), *domHos (Skt. dáma-,
OCS doma, Gr. dòmos, Lat. domus) from the root *demH- ‘to build’ (Gr. démô). 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, *dōuer- (Skt. dváras, Arm. dur-k’,
OCS dvrí, Lith. dūrys, 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, \( *h_2(e)rh_3-t \) (Skt. áta, Av. qiṣṭiṅa-, Arm. dr-ăn- ‘door-post’, Lat. antae, OIr. ṣuṅd ‘ante-room’). There was also a ‘hearth’ (Lat. āra, Hitt. ḫāṣṣa-).

**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 (\( *h_1(ē)d- \), Lat. edō, etc.) and drank (\( *peh_3(i)- \), Lat. pō-culum, ‘beaker’) is not surprising. The verb for ‘cooking’ is known to us, \( *pekʷ- \) (Gr. pēσσω, Lat. coquō, etc.) and perhaps the word for ‘baking’, \( *bh(o)Ḥg- \) (Gr. phōgō, OE bacon). Meat (for consumption) was \( *mēms- \) (Skt. māṁśā-, etc.) There was a word for ‘fish’ (\( *ḍg̣(u)Ḥ- \), Gr. ikhthūs, etc.). Perhaps they ate acorns (\( *g^mH_2(-(e)n-, \) Gr. bālanos, etc.). A very archaic word is the word for ‘salt’, \( *seh_3- \) (Lat. sāl, etc.) The word for ‘grain’ (\( *gṛḤno- \), Lat. grānum, OIr. grān, Goth. kaurn, OE corn), is only found in the west. Old words for different kinds of grain are \( *(H)ieu- \), perhaps ‘bearded wheat’ (Skt. yāva-, Lith. jaiva, Gr. zείαι) and \( *puḤro- \) (Lith. pūrai, Scr. πήρ, Gr. pūrōi).

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

Sweetening was provided by honey, \( *mēlit \) (Gr. méλι, Hitt. miti, etc.).

Of the fruits, we only know the word for ‘apple’, \( *h_2eböl \) (Lith. obu volunte, OCS jábloko, OHG apful.)

The Indo-Europeans drank ‘mead’ \( *medh^3u \), in effect, ‘the sweet’ (Skt. mádhū, Lith. medūs, OCS medo, 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 (ywino) both make use of the same root. It seems to me that the Hittite form, wiyan-, points toward PIE \( *u(e)jH_1-(o)n^- \) (Arm. gini, Gr. oĩnos, Lat. vinum).

**Agriculture.** Words for sowing, \( *seh_1^- \) (Lith. séju, OCS séļo, Goth. saian, OE sæwan) and plowing, \( *h_2erh_3^- \) (Lith. ariū, OCS orj, Gr. arō, Lat. arō, OIr. arim, Goth. arjan) tell us that the Indo-Europeans were acquainted with agriculture. The word for ‘plow’ is derived from this last word, \( *h_2erh_3-trom \) (Lith. árklas, OCS ralo, Arm. arawn, Gr. árotron, Lat. arātrum, OIr. arathar) as is the word for ‘field’ (Gr. ároura, Lat. arvum). Our word ‘acre’, \( *h_2eγros \) (Skt. ájra-, Gr. áγros, Lat. ager, Goth. aks) probably represents fallow land, on which the cattle would be driven (\( *h_2eγ- \), Gr. ágō, etc.). For ‘grain’ see under *Eating and Drinking* above. We know the word for ‘barley’, \( *g^h(e)rdṣh- \) (Lat. hordeum, OHG gersta). A ‘quern’ is also known, \( *g^wH_2uōn \) (Skt. grávā, Arm. erkan, OIr. brao, Toch. B kårweñe), \( *g^w(e)rh_2^-n^- \) (Goth. -qairnus, OE cweorn, Lith. pl. girnos, OCS pl. žræny).
Cattle Raising, Domestic Animals. The most important domesticated animal was the cow, *g*eht₄-us (Skt. gaūs, Latv. ģuovs, OCS adj. gōvědā, Toch. A ko, Toch. B kau, Gr. boūs, Lat. bōs, OHG chuō, OE cú). The word for ‘bull’ was perhaps *teh₂iros (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. šūr. 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’, *h₂euis (Lat. ovis); we also know the word for ‘lamb’: *h₂eg₃-nos (Lat. agnus, etc.). For ‘goat’ we have Gr. aikūs, Arm. aic and perhaps Av. izaēna- ‘of leather’, but the reconstruction *h₂eiɡ- is problematic; and Skt. ajā-, Lith. ožūs < *h₂eg-. A general word for small livestock was *pēku (Skt. pāśu, Lith. pėkus, Lat. pecus, Goth. faihu, OE feoh). From this root was derived Lat. pecūnia, ‘money’, which tells us that livestock served as currency.

‘Milking’ was *h₂melē- (Gr. amēlgō, OE melcan, etc.). The word for ‘milk’ (Gr. gála, gen. gálatos, Lat. lac) is difficult to reconstruct; perhaps it was *glkt-s. ‘Butter’, *h₁(e)ng₃-n (OPr. anklian, OIr. imb) appears according to ancient commentators to have been used in the first instance as ‘ointment’ (Lat. unguen). *tuHri-s was ‘cheese’ (Av. tūrī-, Gr. tūrōs).

The horse was certainly the animal which more than any other characterized the Indo-Europeans: *h₁ekū-(o-) (Hitt. *ekku-, Skt. áśva-, Lat. equus, etc.). We also know the ‘foal’: *p(ō)IH- (Gr. pólos, Goth. fula, E. foal). The donkey or ass is unknown: it belongs to more southern regions. There are two words for ‘pig’: *suHs (Av. hūs, Gr. sūs, hūs, Lat. sūs, OHG sū; cf. OE swīn ‘swine’) was probably the adult pig, whereas *porko- (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’, *kh₂s- (Skt. šaśā-, OE hara) but they were not bred (breeding hares is not that easy).

The favorite domestic animal was without any doubt the ‘dog’, *kuōn (Skt. śvā, Gr. kuōn, OE hun-d, E. hound, etc.), unless the ‘mouse’ also counted (*muHs, Skt. mūs-, E. mouse, etc.).

Clothing. The Indo-Europeans did not need to walk around ‘naked’ (*ne/ogʷ-; Skt. nagnā, Hitt. nekumant-, Lith. núogas, OCS nagō, Gr. γυμνός, Lat. núdus, OIr. nocth, OIr. nakinn, OE naced). There is a root for ‘clothing oneself’, *ues- (Skt. váste, Gr. héstai, Lat. vestire, Goth. wasjan, OE, OHG werian). The root *Hou- probably meant ‘putting on footgear’ (Arm. aganim, Lith. aūti, 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)ieh₂s- meant ‘girding oneself’ (Av. yāst-, Lith. jūostas, Gr. zōstós, etc.). It is clear that the Indo-Europeans wore a girdle of some kind. ‘Weaving’...
(*h₁uebh⁸⁻; Skt. ubhnáti, Gr. ὕψον, OE wesan) and 'sewing' are known (*suH⁻ next to *suH⁻; Skt. syūtā, Lith. siūtas, 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. wułla).

**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: *h₂éios (Skt. áyas, Lat. aes, Goth. aiz, OE ār, E. ore). Iron appears much later. 'Gold', *gʰi(lo)(H)⁻ (Skt. híranya⁻, Av. zaraniia⁻, OCS zlato < *zolto, Goth. gulþ, E. gold), perhaps derived from the word for 'yellow', and 'silver', *h₂(e)r̥-nt (Skt. rajatám with unclear ra⁻, Av. arzżata⁻, Lat. argentum, OIr. argat, perhaps also Arm. arcat'), derived from *h₂erɡ⁻ 'white', were also known.

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

**Weapons** are also difficult to reconstruct. There is Skt. asi⁻ 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: *gʰiH⁻ 'bow (tendon)' (Skt. jiyã⁻, Gr. biós), *isu⁻ 'arrow' (Skt. iṣu⁻, Gr. iós).

**Transport.** The Indo-Europeans made use of wagons, evident by the verb *ueg⁸⁻ 'to carry, ride' (Skt. váhāti, Lith. vežū, OCS vezq, Lat. vehō, Gr. ōkhos 'wagon', OIr. fecht 'trip', Goth. ga-wigan 'to move') and words for 'wheel': *Hrot-h₂ (Skt. rātha⁻ 'wagon', Lith. rātas 'wheel, circle', pl. ratai 'wagon', Lat. rota, OHG rad) and *kʰw-e-kʰl-os (Skt. cakrá⁻, Toch. A kukāl, Toch. B kokale, Gr. kúklos, OE hwēl). The root *Hret⁻ meant 'walk', *kʰw-e⁻ '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 'axel' is also known, *h₂eks⁻ (Skt. ákṣa⁻, Lith. ašis, OCS osb, Gr. áksōn, Lat. axis, OE eax). From the earliest times the wagon was pulled by the 'ox', *uks-én (Skt. ukṣā, Toch. B okso, W. ych, Goth. auhsa). A very important development was the use of the 'horse', which was much faster: *h₁eku(o) (Hitt. *ekku⁻, Skt. áśva⁻, Toch. A yuák, B yakwe, Lith. cf. aśvienis 'stallion', Gr. ἱῆπος, Lat. equus, OIr. ech, OS ehu-skalk 'horse-groomer').

Transportation over water is attested to by *neh₂uś 'ship' (Skt. nāus, Gr. náus, Lat. nāvis, OIr. nau, OIC. nör). We also know the words for 'rowing' and 'oar', *h₁reh₁⁻ (Skt. ari-tár⁻, Lith. irti, 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’, *kʷrīh₂-ti ‘he buys’ (Skt. krinātī, Gr. priastrhai, ORuss. krunuti, OIr. crenim), from which Toch. kuryar/karyor ‘trade’ is derived. ‘Purchase, purchase price’ is *ue/osno- (Skt. vasnā-, Arm. gin, Gr. ὄνος, Lat. vēnum; Hitt. wās- ‘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’ (*ph₂tēr, Lat. pater, etc.), ‘mother’ (*mēh₂tēr, Lat. māter, etc.), ‘brother’ (*b³rēh₂tēr, Lat. frāter, etc.), ‘sister’ (*sūsōr, Lat. soror, etc.), ‘son’ (*suHnu-, *suHiu-, Skt. sūnus, Gr. hūos, Goth. sunus, etc.) and ‘daughter’ (*dʰūgh₂tēr, Gr. thugātēr, Goth. dauhtar, etc.), we also have the word for ‘wife of the son’ (*snuHs, Skt. snuś, OCS snuśa, Gr. nūos, Lat. nurus, OE snoru) and terms for the family of the husband: ‘his father’ (*suekuros, Skt. śvāsura-, Lith. šėsuras, Gr. hekurós, Lat. socer, OHG swehur), ‘his mother’ (*suekruH-, Skt. śvāsr, OCS svkry, Lat. socrus, etc.), ‘his brother’, (*deh₂iuēr, Skt. devār-, Lith. dieveris, OCS dēverb, Arm. taygr, Gr. dāēr, Lat. lēvir, OHG zēihur), ‘his sister’ (*gēlīg₂ōu, OCS zolōva-, Gr. galōs, Lat. glōs) and even the ‘wife of his brother’ (*i(e)nh₂tēr-, Skt. yātār-, OLith. jentē, OCS jaty, Hom. pl. einatēres, Lat. ianitricēs). 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 *uedh₂- ‘to carry (home)’, that is, by the husband (Lith. vedū, OCS vedq, OIr. fedid). The ‘husband’ is referred to as ‘master’, *potiH (Skt. pāti-, Gr. pōsis, Goth. (bruth-) faps ‘fiancé’), he is the ‘master or lord of the house’, *dempotis (Skt. dāmpati-, Gr. despōtēs). The ‘husband of the daughter’ is *g(e)mH₂-ōr, Skt. jāmātār-, Gr. gambrōs.

‘Grandfather’ was *h₂.euh₂-os (Hitt. huhhas, Lat. avus); ‘grandchild’, in a general sense, ‘descendant’, *nēpōt (Skt. nāpāt, Lith. nepuotis, Lat. nepōs, OIr. nia, OE nefa; E. nephe is borrowed from French). There was a special relation with the ‘mother’s brother’ (*meh₂trōus, Gr. métroús) and ‘mother’s father’ (perhaps *h₂.euh₂-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 *h₂.uēd₂uh₂- (Goth. widuwa, etc.)

The family lived in the *u(e)iH- (see the section Places of Habitation above), *uoiko- (Gr. oikos), 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-pātī-, Lith. vięšpats.

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’, *teutā (Lith. tauta, Osc. touto, OIr. túath, Goth. ūiđa, OE péoð), 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 *h₂rēt-s (Skt. rāj-, 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 *uiHrö- (Skt. virà-, Lith. vyras, Lat. vir, OIr. fer, Goth. wair), but also *h₂nēr (Skt. nār-, Arm. ayr, Gr. anēr, 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 *gʰōst-, which could be ‘guest’ but also enemy: OCS gostь ‘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. yōs ‘welfare’, Av. yaoš in yaozdā-, ‘to purify’. Its actual meaning is difficult to establish. The root *dik- ‘to show, indicate, (express)’ probably has a specific legal significance: Lat. iūdēx ‘judge’ < *iūs-dik-s, Gr. dikē ‘justice’, dikaspòlos ‘judge’; *dik- is, then, more or less equivalent to ‘spoken justice’.

‘Stealing’ and ‘thief’ are both known: *(s)teh₂ (Skt. (s)tāyù-, OCS tāp, tātō, Hitt. tayezzi, OIr. tāid).

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. Hēlios, the sun), there is only one name of an Indo-European god which we know, *Diēus *ph₂tēr (Skt. Dyāus pitā, Gr. Zeūs patēr, Lat. Īuppiter). The word is related to ‘day’ (Skt. dīvā ‘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. devā-, Lith. diēvas, Lat. deus, OIr. diá, OIr. pl. tívar; from this root are derived OIr. Týr, OE Tīg, OHG Zīo). The other names for gods have no cognates in other languages. Old etymologies such as Gr. Ouranós (‘heaven’), Skt. Várūna, 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 nāpātā, ‘sons of Zeus’ and who are similar to the Dióskouroi (‘sons of Zeus’) in Greece and the Latvian Dieva déli (‘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. dātā vásūnām, Av. dāta vanhuuam, Gr. dōtēres eulōn ‘those who give goods, riches,’ PIE *dēh₃tōr *h₁uesuom. The gods are, of course, ‘immortal’, *ṛmrī́tos (Skt. āmṛt-, Gr. āmbrotos). The root *dēh₁s-, 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-k’ < *dēh₁s-es, Gr. theōs < *dēh₁s-o-. *kuentos also means ‘holy’ (Av. sponta-, Lith. švėntas, OCS svēta). ‘Believing’ is expressed by Skt. śrad dha-, Lat. crēdō, OIr. cretim, PIE *kred dēh₁-. The root *ięh₂ǵ- ‘to venerate’ we find in Skt. yājate, Gr. hāzomai and hagnós, hágios ‘holy.’ There are several words which would come to mean ‘to pray’: *gʷhedh₂- (OP jadiya-, Lith. pa-si-gendā, OCS žedati, 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. meldziū, OCS molja, Arm. mālt’em, Hitt. māld₁-). *spend- ‘to pour a libation’ (Hitt. ispānt̚-, Gr. spēndō, 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. brahmān-, but the comparison raises difficulties. Lat. vātēs is related to OIr. fāith ‘poet’, Gaul. ouateis ‘seers’ (from the same root we have OE Wōden, OE wōd, ‘song’; OHG wuoτ, ‘rage, fury’). The form is an archaic one, *uēh₂t-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 ‘brahmīns’, the ‘kshatriyas’ and the ‘vaiśyas’. (These names are actually completely different in Iranian.) Dumézil believed that Indo-European society was dominated by an ‘idéologie tripartite’. 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 ἀσός ‘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. áksitam śrávas, Gr. kléos áphthitôn ‘immortal fame,’ which derives from PIE *kléuos *ndh₁gwhitom. The word áksitam is only found in Sanskrit in this context and must therefore be an old survival. In the same semantic area we have Skt. māhi śrávas, Gr. méga kléos ‘great fame,’ PIE *megh₂ *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 andrôn, ‘the famous deeds of men, heroes.’ This formula, too, is found in the Rigveda: śrávas nṛṇām, PIE *kléuesh₂ *h₂nṛóm. 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. sáryasya cakrás and Gr. hēliou kúklos (Aeschylus), but also in OIr. sunnu hvél and OE sunnan hweogul (PIE *sh₂uens *kwekwlos).
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. prthú śrávas ‘wide fame’ Greek has kléos eurú. A not altogether common name for the sun is Skt. spásam víśvasya jágatas ‘he who spies upon the whole world’ (literally ‘the moving one’, or ‘the living beings’), which seems too similar to the Gr. theión skopón ēdē kai andrón ‘he who spies upon gods and men’ to be merely coincidental, but only the root of the noun is etymologically the same (*spek- ‘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 epéon … téktones ‘builders (carpenters) of … songs’ and in the Rigveda it says vácámsi… takṣam ‘I will build words (a song) with carpentry.’ Indo-European had, then, the expression *uék*öš (*uék*éš) *teīk- ‘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):

\[
\text{triṣṭubh} \quad x \ x \ x \ x \ | \quad x \ ^{\prime} \ ^{\prime} \ ^{\prime} \ ^{\prime} \ ^{\prime} \ | \quad x
\]

Sappho \quad - \ ^{\prime} \ ^{\prime} \ ^{\prime} \ ^{\prime} \ x \ | \quad - \ ^{\prime} \ ^{\prime} \ ^{\prime} \ ^{\prime} \ | \quad 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 śvā prśā  rś mai vauca, Ahura:
Kas-nā ḍṛta  zām ca adāh nabāś ca
avapastāś,  kah apah urvarāś ca?
Kah vaṛatāi  vanmabyas ca yaugt āsū?
Kas-nā vahauś,  Mazdā, dāmiś 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?

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):

\[
\begin{align*}
\text{Segðu mér, Alviss,} & \quad \text{— sll of rök fira} \\
\text{vormk dvergr, et vitir} & \quad \\
\text{hvé sú sól heitir,} & \quad \text{er sið alda synir,} \\
\text{heimi hveriom í.} & \\
\end{align*}
\]

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, *kupárisos* ‘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’, *Krētē*, *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 *Pelagian* 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 *bʰeh₂ǵ- (Russ. buziná, Gr. φῆγος, Lat. fāgus, OE bôc). 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. φῆγος 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 *mōri (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’, *lōkšas (Toch B. λαξ, Lith. lāšis, 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 *demh₂-, Skt. damāyati, Gr. dámnémi, Lat. domāre, Goth. gatamnian, OIr. damnáid; 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 ō in Greek always corresponds to an a in Sanskrit:

Gr. néphos ‘cloud’ — Skt nábhás
Gr. ostéon ‘bone’ — Skt. ásthi

The assumption arrived at is that ō 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. jánu,

shows us an exception, for the Greek ō is here paralleled 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 ō 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):

<table>
<thead>
<tr>
<th>Skt.</th>
<th>1 sg. pf.</th>
<th>tatána</th>
<th>cf. Gr.</th>
<th>têtona</th>
<th>‘I stretched’</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 sg.</td>
<td>tatána</td>
<td></td>
<td></td>
<td>têtone</td>
<td></td>
</tr>
</tbody>
</table>

In the first form we would expect to see an ã in Sanskrit. The problem was solved when it appeared that the 1 sg. -a derived from *-h₂e [-te], 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 lūō 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. *peregrinus* ‘foreigner’ > *pelegrinus* (E. pilgrim). Lat. *carmen* ‘song’ is supposed to have come out of *can-men. In Gr. éeikon ‘I said’ < *h₁-e-ue-ukʷ-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-ukʷ 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. *egēgōra* ‘I am awake’ came from *egēgōra (< *h₁-ge-h1 gor-h₁e, from the root *h₁g(e)r- which we see in egeirō ‘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. *bê [bê], the sound that goats make. The relevant sound law would now require this to be *vi, but it naturally continues to be [bê].

Words which very frequently occur sometimes exhibit unusual ‘wear and tear’, for example, Lat. *nōn ‘not’ < *ne oinom ‘not one’; *nihil < *ne hilum, G. nur ‘only’ < MHG *ne ware < 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 unusual, 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 course, 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

\[
\text{gen. sg. } méne-os \text{ ‘of the willpower’ } < \text{ PIE } * \text{ ménes-os, cf. Skt. mánas-as}
\]

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 \( *kʰi-ti-s \), cf. Skt. \( cí-ti- \). We can for this reason formulate a (relative) chronology to explain what has happened:

1. \( s > \emptyset \) between vowels;
2. \( t > s \) (before \( i \ldots \)).

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 \( phē-si \), ‘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. *haud 'I heard,' OHG hörta, ON heyrþa (*hau- was a long syllable)
Goth. *nasād ‘I saved,’ OHG nerita, but ON talþa (< *talþa) (*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 gostv; 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 (OA v. 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’ < *uiniz. 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-belir ‘he gives’ < *te-; as-belir ‘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’ < *mh₂krós, but négretos ‘from which one cannot be awoken’ < *η-ηgr-eto, 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 ηh₁ > 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:

\[ o, u > \ddot{o}, \ddot{u} \text{ before } i, j \]

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’: /ˌi,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 $*kwod$
Skt. -ca ‘and’ — Lat. -que; PIE $*kwé$

The discovery that -ca derives from $*kwé$, 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 $*k >$ Skt. ś: PIE $*kmítom$ ‘hundred’ > Skt. śatáṃ. Sanskrit did not have the ś sound before. Or, for PIE $*h₂ >$ Gr. $a$: $*ph₂tér$ ‘father’ > $patér$.

   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 $*h₁lngʰu$-.

3. **Loss:** $A > Ø$

   ($Ø$ is ‘zero’ or ‘nothing.’) A $p$ disappeared in Celtic: PIE $*ph₂tér >$ 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 ($\emptyset$). 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 $j; t$ before $e, i$; and $p$ elsewhere. The root $*kʷel$ ‘turn itself’ is found in:

$tέllomai$ ‘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* $< gʷouko-lolos$), 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, ex crescence): $\emptyset > A$

Here a phoneme simply comes into being where there was none before. The genitive of Gr. *anér* ‘man’ is *andrós* $< *anros$: a sound comes into being between the $n$ and the $r$. The perfect of Lat. *sum-ō* is *sumpī* $< *sum-sī$. 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 $*bʰrehis₂tʰér$ ‘brother’ $> *brátēr$ Arm. *elbayr* (with $br- > bʰ- > lb-$).

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’ $< *stablom$ ($< *sth₂,dr�-lom$). 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 *h₂egros*). The vocalization mostly yields $Vr$ or $rV$, etc. ($V =
vowel). For example, PIE *mṛtō- ‘dead’, Skt. mṛtā-, but Lat. mortuus, Gr. Aeol. brotós, Lith. mūtis ‘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 *kʷ lost its labial articulation before o or u in Latin: cum, OLat. quom < *kʷom; colō ‘I take care of’ < *kʷolō < PIE *kʷelō (compare Hom. Aeol. pělomai). 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 kʷo- 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. rōcate ‘to shine’ < *leuk-e- (Hitt. lukk-, Gr. leukós ‘white’), cid ‘even’, -ever’ < *kʷid (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] < *keusan-. 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 Persian, 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 \( \theta < t \) in miθra-, Skt. mītrā- ‘treaty’, Av. \( f < p \) in afnah-, Skt. āpnas- ‘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 \( p > \emptyset \) and \( s > \emptyset \) (see Sections 4.7 and 4.3). The PIE laryngeals (\( h_i \), etc.; see Section 11.8) often became zero: Lith. vėm-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. ἐφέρει ‘he carried’ — Skt. ābhara. 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 [fɔz 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 dissimilation 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 nat-ālis ‘of birth’ and mort-ālis ‘mortal’ we find milit-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 gradɔ́ 'city' (ra < rä < rō < or) < *gʰordʰ-, compare Lith. gařdas, Goth. gards 'house' (OE geard, E. yard). In Ossetic, ŧr is metathesized to rt, e.g. Oss. (Digorón dialect) furt 'son' < Old Iranian *puθra-, Oss. cirt 'grave' < *ciθra-, art 'fire' < *aθr-.

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:

\[
\begin{array}{ccc}
\text{front} & \rightarrow & \text{back} & \rightarrow \\
\text{rounded} & \rightarrow & \text{high/closed} & \\
i & & u & \\
e & \sigma & o & \\
a & & & \text{low/open}
\end{array}
\]

(σ 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 *h₁ed-. 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:

\[ i > e \text{ and } u > o \text{ before } r; \text{ the } r \text{ has a lowering effect, } \text{serō 'to sow'} < *si-shj-o, \text{ cf. pf. } \text{sē-vi} < *sēhj-;} \text{ fore 'shall be'} < *fu-se, \text{ cf. futūrūs.} \]

\[ e > o \text{ before } ĭ, l, mo \text{ and after } ĭ \text{ before } Co \text{ (consonant+o). novus 'new' < *neuos — Gr. néos; volō 'I will' < *vel-ō, \text{ cf. subj. velim (l is a velar } l \text{ before } i \text{ and } e \text{ a Lat. } l \text{ is not velar); homō 'human' < *dghemōn, \text{ cf. nēmō 'no one' < *ne-hemō (a long } ē \text{ remained unchanged); bonus 'good' < OLat. duenos, \text{ cf. adv. bene. We see, then, that } e \text{ becomes a rounded vowel (o) before } ĭ, \text{ and after } ĭ \text{ if the following syllable contained an } o; \text{ before a labial sonant (m) if followed by an } o; \text{ and before an } l \text{ unless followed by a front vowel.} \]

\[ o > u \text{ before } m: \text{humus 'earth' < dghom-}, \text{ Gr. khton-}. \]

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: confessus; 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. legītis < *-te-s; 3 sg. pass. legītur < *-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 \( o \):

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

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:

\[
\begin{array}{cccc}
  i & y & u \\
  e & o & \\
  & & \circ \\
  & & \\
  & a
\end{array}
\]

\( (\circ = Ѧ; y = Ǣ; o = ð as eu in Fr. peu) \)
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 *gastir ‘guest’ < PGM. *gastir, fylla ‘to fill’ < *fulljan; komr ‘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: \(a > ø; e > ø; i > y\). The vowels shift in the direction of the \(u\). The phoneme \(ø\) 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 \(e > eo > io > io\) before syncopated \(u\), for example *heldar > hialdr ‘battle’; *erpu > iorpu ‘earth’.

‘Nasalization’ occurs whenever a following nasal disappears as an independent (oral) consonant and the vowel takes over the nasal articulation: OCS puť ‘way’ — Gr. póntos < *pon-, péťo ‘fifth’ — Lith. penktas < *penk-os.

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. réx.

Conditioned changes lead to splits. In Old Irish \(ō\) became \(ā\), but in final syllable, \(ū\: dān ‘gift’ (ā is a long vowel) — Lat. dōnum; siur ‘sister’ < *sueār — Lat. soror (< -ār).

Diphthongization of long vowels: \(ō > Lith. uo, OLith. nepuotis ‘grandson’ < *nepōs, Lat. nepōs.

Shortening often occurs in final syllables: -ām > Lat. -am, acc. sg. aquam ‘water’; *-ēr > Lat. -or, orātor ‘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. Dyāus (au < ēu); Goth. winds, Lat.ventus ‘wind’ < *uēnto- (< PIE *h₂ueh₁nte-).

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. civ-ēs ‘citizens’ < *-ēj-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: idem ‘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 = ơ) < *-onsa < *-ont-ja, cf. gen. masc. lúont-os. Lengthening of e, i, u, before rj, nj: philētirō (ei = ē) < *phtherjō. Before R_u (R = resonant), Ion. kálōs ‘beautiful’ < *kaluos, Boeot. kaluos (no lengthening in Attic: kálōs). 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 ħ 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 grade ‘city’ (a < ā < ơ) < *gʰordh₂- (see Section 4.8.3).

Lengthening also sometimes occurs in monosyllables: Lat. für ‘thief’, Gr. phór (Lat. *för > for > fur >)für).

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 i (that is to say, ii), an ou becomes ū, for example in Latin dicō ‘to say’, OLat. deicō, cf. Gr. deiknūmi ‘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 > ơ, so Skt. ēti ‘he goes’ < *aiti < PIE *h₁eiti (Skt. e = ē), Gr. eisí; lokā- ‘space, world’ < *loukos (Skt. o = ơ), Lat. lūcus, OLat. loucom ‘sacred grove’, OHG lōh (cf. Waterloo). PIE *oi becomes OCS ē [ē], snēgo ‘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 ([ē], written ē). The lengthened e mentioned above merged in Ionc-Attic with this new ē, but in Doric with the old ē: Ion. eimí, Cret. ēmī < *h₁esmi. In Germanic a new ē came into existence, the ě₂ which originated from ei before a, a sound which merged with old ē in Gothic but not in other languages: pret. ON hēt, 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 ȧī < *āi in closed ones: aēuua- ‘one’ < *aīwa- but šōītra- ‘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 i : 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, ù became û, ũ, an asymmetrical system came into being (the forms in parentheses came into existence later):

\[
\begin{array}{c}
i \\
e \\
a \\
\end{array}
\begin{array}{c}
\tilde{u} \\
\hat{u} \quad \tilde{u} \quad \hat{u} \quad (\hat{u} < ou) \\
\tilde{e} \quad \hat{e} \quad \hat{e} \\
\hat{a} \\
\end{array}
\]

Because of the monophthongization of ei an \( \tilde{e} \) came into being (written as e). One would then expect \( \hat{e} \) to develop out of ou (which would give symmetrical \( \tilde{e} : \hat{e} \)). It is quite easy to understand, however, that \( (ou >) \hat{e} \) became \( \hat{u} \), 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 \( \tilde{e} \). 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 : bh/, 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 /bh/ by +voice, +aspiration. If the system has a /pʰ/ instead of /bʰ/, 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 (/t, th, d, dh, n, s/) 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 /ɣ/. 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 $= \text{analogy in a strict sense}$ 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. $pês$, gen. $pêdis$, Gr. Dor. $pôs$, pod-ôs, Skt. $pât$, pad-ás. The explanation is that the accusative ending $-m$ was vocalized after a consonant ($-m$) and in Germanic became $*-u$m. 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:

$sûnum : sùnus = fotum : x, x = fotus$

One could also say that $fot-um$ was reinterpreted as $fotu-m$ according to the model of $sûnu-m$. 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 -ś, for example OCS bogā ‘god.’ In Balto-Slavic the accusative ending *-n (after consonant) becomes *-im, and this is the basis for root nouns becoming i-stems, for example Lith. pilis ‘fortress’ next to Skt. pūr ‘city’, acc. pūr-am. In Sanskrit the word for ‘night’ also got a nominative nāktam on the basis of the accusative nāktam, through analogy of the neuters which had -am in the nominative and accusative, as in yugām ‘yoke.’ The old nominative was nāk < *nakʷt-s, cf. Lat. nox, noct-is, Gr. nύξ, nukt-ός, Goth. nahts. Skt. nāktam became an o-stem in this way and, moreover, a neuter, while it had originally been feminine. The reason for the change was that nāk, nākt-am was an unusual declension in Sanskrit.

The aorist of kṛ- ‘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. hépei, 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-(ό) ‘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, -erit 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’, poimén, has in other cases the stem poimen-, except in the dat. pl., where we find poímé-si. This form must have developed out of *poim-ṃ-si (with a vocalized ŋ), 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 phrên, ‘midriff, mind’ the dat. pl. form phrasí occurs along with phresí.
The accusative ending -ṃ must have produced an -a in Sanskrit according to sound law, as we see from saptā ‘seven’ < *septm, Gr. hepta, 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 -ṃ; 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. naũ-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 -bhyaśas. The -s is thus seen as characteristic of the plural. Armenian has -bk’ < *-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-bk’.

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):

<table>
<thead>
<tr>
<th>Gr. pa-tēr</th>
<th>ré-tōr</th>
<th>krā-tēr</th>
<th>Lat. pa-ter</th>
<th>orā-tor</th>
</tr>
</thead>
<tbody>
<tr>
<td>-tēr-a</td>
<td>-tor-a</td>
<td>-tēr-a</td>
<td>-tr-em</td>
<td>-tōr-em</td>
</tr>
<tr>
<td>-tr-ōs</td>
<td>-tor-os</td>
<td>-tēr-os</td>
<td>-tr-is</td>
<td>-tōr-is</td>
</tr>
</tbody>
</table>

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. krātēr 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 *aiges-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 -imus (vic-imus ‘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: *hētetai was replaced by hēpetai; *rē-tr-os was replaced by rē-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 *deiwos (Osc. deivai, Skt. devā-). The operation of sound law resulted in deus (ei > ē; ū > ōl̩_ū; ē > e before vowel), but the genitive form *deiwī became divī (ei > ē > ĩ). What then happened is that deus developed a complete declension of its own (gen. deī, and so forth) as did divī (nom. divus and so forth). Finally, divus was displaced by deus, and only continued to be used to refer to the deified emperor as divus 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. mēnos, gen. mēne-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. ē-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. *legit* : *lēctus* ‘to read’ : ‘(having been) read’ (Lachmann’s law). One explanation for this would proceed as follows:

\[
\text{pres. act.} : \text{pf. act.} = \text{pres. pass.} : \text{pf. pass.}
\]

\[
\text{legit} \quad \text{legitur} = \text{lēgit} \quad x, \quad x = \text{lēctus (sum)}
\]

This explanation is fraught with a number of factual problems: with *agīt*, *agītur*, *ēgīt* ‘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 *facīt*, *facītur*, *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 < *-m in Sanskrit is replaced by -am, a reduction of the number of accusative endings is achieved. In Greek the accusative in -a (pōd-a) was preserved, probably because there are few accusatives in -an in that language (only from words in *-ia). 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. -o). This form was the basis for the Slavic nominative ending -o, 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. -a). 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, -tôr (Section 5.3). But Gr. anér ‘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 anérōs, 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)-h₂ (h₂ = i), *-so, *-to, which gave Greek *-mah₂, *-so, and *-to. The -i was (analogically) added on in order to characterize them as (primary) present-tense endings, whereby *-mai (< *-mah₂i), *-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 -män < *-mah₂m (> Ion. Att. -mên), -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 -män 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 élûsa, 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. elásō < *elû-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 elélûso, 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 -têr, -tôr we saw that patêr 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 patêr 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. oída ‘I know’, 1 pl. ēdmen ‘we know’, the old interchange o/í (cf. Goth. wait, witum, Skt. vēda, 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. oidamen 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 *h₁és-ti, *h₁s-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 devētā ‘nine’ with d- instead of n- (cf. Latin novem, Skt. náva, E. nine) taken from desētā ‘ten.’ In Tocharian (dialect B) the word for ‘mother’, măcēr, has the ā of pācēr ‘father’ (< *ph₂tēr). According to sound law *mocēr would be expected from *meh₂tēr for ‘mother’; compare procer ‘brother’ < *bʰreḥ₂tēr.
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: žiemojė ‘in winter’.

The 1 sg. subjunctive in Sanskrit ended in -ā or -āni, e.g. āy-ā(ni) ‘I should go’. The old form is that which ended with -ā (< *-ō; cf. Gr. pres. leipō). 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. ymnits in imma tans stan geitin versus ymnits stan geitin ‘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 -tō, 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. hoítos ‘the one (who is with you)’ is ho+u+to-. Gr. ekeínos ‘there’ also probably consists of three elements: PIE *h₁e, *ke(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. -yeni 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 -ē- < *-oi-, and that is the characteristic of the old (thematic) optative; e.g. bpděte ‘you must be’. Slavic no longer has a separate optative.

The subjunctive of ‘be’ in Old Latin was siem, siēs, siēt, sīmus, sītīs, sīent. 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-mē-noi eisi ‘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, -dedup, -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 *dʰē- (PIE *dʰeh₁-), cf. Gr. tī-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 *bʰā- ‘be’, Lat. pf. fui. — The Slavic imperfect was characterized by an element -ax-, e.g. vidēax ‘I saw’. This derives from -ōs-, which probably is the old perfect of ‘be’, e.g. Skt. āśa ‘I have been’ < *ōs-a (< *h₁e-h₁os-h₂e, 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. mūrdhān-, Lith. galvā, OCS glava, Gr. kephalé, Lat. caput. These must have all taken the place of some other word, probably the one that is still found in Skt. śīras-, Gr. kārē (PIE *kr(e)h₂). Neither do we
find many related words in the Indo-European languages for ‘hand’: OE folm, Goth. handus, Skt. hásta-, Gr. kheir, Lat. manus, Lith. rankà. The old word surely continues to be found in Gr. kheir (PIE *ǵhēs-r) but in the languages named above it has disappeared (Skt. hásta- is derived from the same root, *ǵhēs-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 loan-word, 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. kardia ‘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 aftokiníto < autokinētos. 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 not 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. anti ‘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
broader 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. *pōtio* (acc. *pōtōnem*) ‘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. *pōtio*.

### 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 ‘hospitalable 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 to 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 nēléēs 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 ablatitive (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 devébhír á gamat ‘may the god come with the other gods’ (devé-bhir) (Rigveda 1.1.5) and áhan vrtrám indro várêna ‘Indra killed Vrtra with his lightening bolt’ (várêna) (Rigveda 1.32.5). Greek used the dative here, usually with a preposition: oíkad’ iòn sùn nèusí te sèis kai soís hetároisi Murmidónêsson 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 (Murmidónêsson) 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 of its perfect. That the aorist and the perfect merged can be seen in the forms: vidi 'I have seen' < *uoid-h₂e-i is an old perfect, cf. Gr. oíd-a; dixi '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-ô 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. namuoses tavuosna '(up to) in your house' (-uos acc. pl. ending; tâvas 'your'); pagirtosp mergosp Mariosp 'to the praised virgin Maria' (-os gen. sg.; mergâ '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, 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 kàssì 'teacher':
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 *novo-jbo ‘new’, gen. *novo-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 *dobro-jbo člověko. Lithuanian originally had the same system: *geras-is žmogus ‘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: *parabolare 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) *lip saei ..., minnista haitada in þiudangardjai himine; *lip saei ..., 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 orppen, Goth. waurpans ‘thrown’; OE gebrocn ‘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-mig-ē (pass. later e-μίκθῃ). When the element -thè- 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 τόκς ὀμοίσιν ἐκθῆν ‘with the bow over the shoulders’ (Iliad A 45), the dative (= locative) is sufficient. But in amphi δ’άρ ὀμοίσιν βάλετο κσίφος ἀργυρόελον ‘(and) around his shoulders he threw (the carrying-strap of) his sword with silver buttons, amphi ‘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 ἔνας (from classical Greek ἡν- ‘one’). Of the Celtic languages, Irish and Welsh have none, but Cornish and Breton have un (also from ‘one’, *oinos, cf. Lat. únus, 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: 
\( \text{G\textquotesingle}S\text{GIGIR} \ t\text{ür}i\text{jan} \ h\text{ar}\text{-}\text{yen}i \ ‘we have harnessed the battle-chariot’ (GIGIR is the Sumerian word for ‘battle-chariot’; \( \text{G\textquotesingle}S \) is a Sumerian determinative, ‘wood’; \text{tür}i\text{jan} \ is \ ntr. \ sg. of the participle ending in -\text{ant}; \text{har}-\text{yen}i \ ‘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: \( \text{kai \ dê \ doûra \ sësêpe \ neôn \ kai \ spárta \ lêluntai} \ ‘and see the beams (the woodwork) of the ships (is) rotted and the ropes are hanging slack’. Here \text{doûra} \ and \text{spárta} \ are ntr. pl.; \text{sësêpe} \ is (perf.) singular, but \text{lêluntai} \ 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: \text{me so pres} \ ‘I am ready’ (so is 3 sg.); \text{enn \ amzer-nevez \ al \ laboused \ a \ gan} \ ‘in the spring the birds are singing’ (\text{amzer} \ ‘time, season’; \text{nevez} \ ‘new’; \text{gan} \ is 3 sg. of \text{kanañ} \ ‘to sing’, cf. Lat. \text{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. (\text{pcl}=\text{particle}, \text{loc.pl}=\text{locative plural}):

\[
\begin{align*}
\text{LÜ}^{\text{MEŠ}} \ \text{G\textquotesingle}S\text{BANŠUR-kan} & \ 2 \ \text{NINDA} \ \text{mitgaimis \ appanzi} \\
\text{man}^{\text{pl}} \ \text{wood-table-pcl} & \ 2 \ \text{bread} \ \text{mitgaimi} \ \text{take} \\
\text{n-as-kan} & \ \text{āppa \ suppājas} \ \text{G\textquotesingle}S\text{BANŠUR}^{\text{HLA}} \ \text{as \ tianzi} \\
\text{and-them-pcl} & \ \text{back} \ \text{pure} \ \text{wood-table-ploc.pl} \ \text{put} \\
\text{‘The table-people take the 2 mitgaimi-loaves and put them upon the pure tables again.’}
\end{align*}
\]

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

\[
\text{Im-diched \ in \ cú \ Laigiù \ huili} \ \\
defended \ the \ dog \ Leinster \ all \\
\text{‘The dog (= the hero Cuchulainn) defended all of Leinster.’}
\]

Here the adjective (\textit{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. *patér*, gen. *patrós* the analysis *pat-*ēr, *patr-ōs* ‘father’, would seem to be obvious. If we employ the same analysis to *anér*, *andrós* ‘man’, we then get *an-ēr*, *an-d-r-ōs*, 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 *hēōs*, but in the closely-related Ionic Greek it is ëōs. 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 ë 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
**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 -ntai 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:

\begin{align*}
ei/oi/i: & \quad leíp-ō & le-loip-a & é-lip-on & \text{to leave} \\
ei/oi/i: & \quad eid-ō & oíd-a & id-men & \text{to know} \\
eu/ou/u: & \quad eleûs-omai & elêlouth-a & éluth-on & \text{to come} \\
eu/ou/u: & \quad reû-ma & (ró-os) & perí-rrutos & \text{to stream} \\
en/on/a: & \quad mén-os & mé-mon-a & mé-ma-san & \text{to think} \\
er/or/ra: & \quad patér-a & eu-patór-a & patrá-si & \text{father} \\
\end{align*}

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:

\begin{align*}
\text{patër} & \quad \text{eu-patór} & \text{patéra} & \text{eupátor} & \text{patrási} & \text{father} \\
\text{kër} & \quad \text{kradiē} & \text{heart} \\
\text{Dor. pós} & \quad \text{póda} & \text{foot} \\
\end{align*}

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

We thus get a system e/o/Ø/e/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:

<table>
<thead>
<tr>
<th>Greek</th>
<th>Laryngeal Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>ē/ō/e</td>
<td>thō-mós</td>
</tr>
<tr>
<td>â/ō/a</td>
<td>phā-mí</td>
</tr>
<tr>
<td>ō/ō/o</td>
<td>phā-mí</td>
</tr>
<tr>
<td></td>
<td>thō-mós</td>
</tr>
<tr>
<td></td>
<td>phā-mí</td>
</tr>
</tbody>
</table>

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, â, 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:

<table>
<thead>
<tr>
<th>Greek</th>
<th>Laryngeal Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>ō/ō/o</td>
<td>pō-ma</td>
</tr>
<tr>
<td>phā-mí</td>
<td>phā-mí</td>
</tr>
<tr>
<td></td>
<td>phō-nā</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>ē/ō/e</td>
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</tr>
<tr>
<td>â/ō/a</td>
<td>phā-mí</td>
</tr>
<tr>
<td>ō/ō/o</td>
<td>phā-mí</td>
</tr>
<tr>
<td></td>
<td>thō-mós</td>
</tr>
<tr>
<td></td>
<td>phā-mí</td>
</tr>
</tbody>
</table>

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 â was also e + something else (but something different than in the case of ē). Thus as follows:

<table>
<thead>
<tr>
<th>Greek</th>
<th>Laryngeal Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>ē/ō/e</td>
<td>thō-mós</td>
</tr>
<tr>
<td>â/ō/a</td>
<td>phā-mí</td>
</tr>
<tr>
<td>ō/ō/o</td>
<td>phā-mí</td>
</tr>
<tr>
<td></td>
<td>thō-mós</td>
</tr>
<tr>
<td></td>
<td>phā-mí</td>
</tr>
</tbody>
</table>

I  | e | o | Ø | ē | ō
II | ē | ō | e | ? | ?
    | â | ō | a | ? | ?
    | ō | ō | o | ? | ?

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 pha-
ryngeal) consonants. They are now mostly reconstructed as *h₁, *h₂ and *h₃, 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:

\[
\begin{align*}
\text{ē}/\text{o}/\text{ə} & \quad \text{now: } eh₁/oh₁/h₁ \\
\text{ā}/\text{o}/\text{ə} & \quad eh₂/oh₂/h₂ \\
\text{ō}/\text{o}/\text{ə} & \quad eh₃/oh₃/h₃ \\
\end{align*}
\]

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 im-
portant 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 de-
scribing 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 ex-
ternal 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, fram-
ing 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 every-
thing 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
decension of the nouns and the pronouns affect each other; (e) you would have to ex-
amine 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 ances-
tor. 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 as-
sumption is not made, chaos will be the result. Only when it is clear that the assump-
tion 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 prin-
ciple 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 *-ôm for the ending of the genitive plural of the Indo-European languages, but Gothic has -ê (which may have come out of -êm 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 *-êm next to *-ôm. Since the Gothic ending is also unique with respect to the other Germanic languages, it seems more probable that -ê 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. y 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. garðma- ‘warm(th)’, Skt. gharma- ‘glow’, Av. darðya-, Skt. dirghá- ‘long’
Av. b = Skt. b: Av. bāzu-, Skt. bāhū- ’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. duś-, 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 Pʰ, a (probably) aspirated labial occlusive.

Internal reconstruction will take us further. Greek has nom. néphos, gen. népheos, later néphous /nephós/. 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-ös (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 nebe-s-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 *nePʰes-es-ös.
Now we can take other languages into consideration. Skt. nábhās-ās 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 *bh probable. We may add that the accentuation of Sanskrit happens to coincide with that of Greek. We now have *nébhes-ēs/-os.

Hitt. nēpis-ās 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 *ē 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:

<table>
<thead>
<tr>
<th>OCS</th>
<th>nebo</th>
<th>Gr.</th>
<th>néphos</th>
<th>Skt.</th>
<th>nábhās</th>
<th>Hitt.</th>
<th>nēpis, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>nebese</td>
<td></td>
<td>népheos</td>
<td></td>
<td>nábhāsas</td>
<td></td>
<td>nepīsas</td>
</tr>
<tr>
<td>etc.</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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</tbody>
</table>

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. ákārī ‘was made’ (kar- ‘to make), ájānī ‘was born’ (jan- ‘to be born’), ádārsī ‘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 ā-darś-i). Some roots of the type CaC are exceptional in that they show short a (e.g. Skt. ájānī), 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 à 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. àkārī < (ḥé-)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: τρόπις ‘keel’ (to τρέπω ‘to turn’);
Germanic: Goth. balgs ‘leather bag’, Olc. belgr ‘skin; bellows’ < PGm. *balgi- ‘bel- low’ (to *belg- ‘to swell’);
And probably also in Indo-Iranian itself: Skt. ghāsi- ‘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, potsher’d’, ‘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 reinterpretation 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:
### Table

<table>
<thead>
<tr>
<th></th>
<th>thematic</th>
<th>athematic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skt.</td>
<td>-a-māna-</td>
<td>-āna-</td>
</tr>
<tr>
<td>Prak</td>
<td>-mina-</td>
<td></td>
</tr>
<tr>
<td>Av.</td>
<td>-a-mna-</td>
<td>-āna</td>
</tr>
<tr>
<td>Gr.</td>
<td>-o-menos</td>
<td>-menos</td>
</tr>
<tr>
<td>Toch. A</td>
<td>-mām</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>-mane</td>
<td></td>
</tr>
<tr>
<td>Lat.</td>
<td>(-u-mnus</td>
<td>-mina)</td>
</tr>
</tbody>
</table>

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* (*ṃ*) becomes an a. The *m*, in the athematic forms, occurred after the consonant and could, then, have been vocalic. We are looking, therefore, for a consonant that lengthened a (*-ṇXna-* > *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 (*ḥ*), 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 *h₁ > 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:

<table>
<thead>
<tr>
<th>CONSONANTS</th>
<th>Traditional reconstruction</th>
<th>Modern reinterpretation (see 11.3.6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSONANTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>occlusives/stops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>labials</td>
<td>$p$ $b$ $b^h$</td>
<td>($= p$ $p’$ $p$)</td>
</tr>
<tr>
<td>dentals</td>
<td>$t$ $d$ $d^h$</td>
<td>($= t$ $t’$ $t$)</td>
</tr>
<tr>
<td>palatals</td>
<td>$k̄$ $ḡ$ $ḡ^h$</td>
<td>($= k̄$ $k’̄$ $k̄$)</td>
</tr>
<tr>
<td>velars?</td>
<td>$k$ $g$ $g^h$</td>
<td>($= k$ $k’$ $k$)</td>
</tr>
<tr>
<td>labiovelars</td>
<td>$k^w$ $g^w$ $g^{wh}$</td>
<td>($= k^w$ $k^{w’}$ $k^w$)</td>
</tr>
<tr>
<td>fricatives</td>
<td>$s$</td>
<td></td>
</tr>
<tr>
<td>laryngeals</td>
<td>$h_1$ $h_2$ $h_3$</td>
<td>($= ̄$ $s$ $s^w$)</td>
</tr>
<tr>
<td>sonants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>liquids</td>
<td>$r$ $l$</td>
<td></td>
</tr>
<tr>
<td>nasals</td>
<td>$m$ $n$</td>
<td></td>
</tr>
<tr>
<td>semivowels</td>
<td>$i$ $u$</td>
<td></td>
</tr>
<tr>
<td>VOWELS</td>
<td>$e$ $o$</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$e$ $o$</td>
<td></td>
</tr>
</tbody>
</table>
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. *p’ etc. indicate glottalized consonants (see Section 11.3.6).

The sonants can have consonantal and vocalic allophones, e.g. r/r̥, į/i. Thus r is a vocalic r, į is a consonantal i, etc. Yet r was merely an allophone of r, į 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 sonants.

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. patēr ‘father’, eupātōr ‘of good descent’ we find:

<table>
<thead>
<tr>
<th></th>
<th>acc.</th>
<th>acc.</th>
<th>gen.</th>
<th>nom.</th>
<th>nom.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gr.</td>
<td>pa-tēr-a</td>
<td>eu-pā-tor-a</td>
<td>pa-tr-ōs</td>
<td>pa-tēr</td>
<td>eu-pā-tōr</td>
</tr>
<tr>
<td>PIE</td>
<td></td>
<td></td>
<td>*-tr-su</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skt.</td>
<td></td>
<td></td>
<td>pi-tē-śu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gr.</td>
<td></td>
<td></td>
<td>pa-trā-si</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

([r] 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

<table>
<thead>
<tr>
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1. *h* (or Ø) in anlaut, *w* after a vowel
2. *b* in anlaut, *w* between vowels
3. *dh* between vowels
4. *c, s* before *e, ē, i, i* in *d* before consonant, *t̥j, dʰj > ts*
5. *p*- word-initially, *pp*- between vowels
6. *t*- word-initially, *tt* between vowels; *t̥j > z*
7. *dʰj > s*
8. *f* in anlaut
9. *f* in anlaut, *b* after *u, r*, before *r, l*
10. *f, ũ* 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 *bʰ, dʰ* 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 *nebhɔs ‘cloud’: Skt. nabh-, Av. nabah-, OCS nebo, Lith. debesis, Hitt. nepis, Gr. néphos, Lat. nebula, OHG nebál.
PIE *ters-/trs-* ‘to dry out, to thirst’: Skt. ṭṛṣyati, Arm. *taramim, Alb. ter, Gr. tērōmai, Lat. torrō, Goth. ga-PAIRSAN (ai = [e]) < *ters-, ṭaurus (au = [a]) < *trs-; cf. E. thirst.*
PIE *h₁uidʰeu-, -uh₂ - ‘robbed, unmarried; widow’: Skt. vidhávā, OCS vədɔva, OPr. widdewā, Gr. ēthēos ‘unmarried young man’ (with ē- from metrical lengthening of e-), Lat. vidua, OIr. fédh, MW gweddhw, Goth. widuwo, E. widow.

Exercise 1
Reconstruct the PIE obstruent from which the bold-face consonant is derived:

a. Goth. tuz-, Skt. dus-, Gr. dus- ‘bad’

b. Lat. ferre, Goth. bairan ‘carry’, OIr. -beir ‘bears’

c. Arm. hur, Gr. πῦρ, OHG fiur ‘fire’

d. Arm. stipem ‘to force’, Gr. στείβω ‘to trample’

e. Goth. mitan ‘to measure’, Gr. μέδομαί ‘to plan’, OIr. med ‘scales’

f. Lith. bāsas, OCS bošū, Arm. bok ‘barefoot’

g. Toch. B ściryə, Hitt. hastēr-, Lat. stēlla, NHG Stern ‘star’

h. Hitt. šuqattas ‘day’ (gen.sg.), Skt. dyūt- ‘splendour’

i. OLat. iouvēre ‘to order’, Lith. judēti ‘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 satam ‘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 = [xʷ]) 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 *kʷ, *gʷ, *gʷh 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, *gʰ.
1. *k š s s š s th, k<sup>5</sup>  
2. *g j z z ž c dh, g<sup>5</sup>  
3. *gʰ h z z ž j, z<sup>3</sup> d-, dh  

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1. c [tš], j [dž], h, before PIE e, ê, i, j.  
2. ě, ž, before PIE e, ê, i, i; j [ts], (d)z before ě < *oi (and after b, i, ě, iH, iN).  
3. j = [dz]; z between vowels.  
4. j before PIE e, ê, i, j.  
5. k, g before resonant.  
6. s, z before front vowels; q, gj secondarily before front vowels.  
7. š before PIE e, ê, i.  
8. k-, ku- word-initially, -kk-, -kku- between vowels.  
9. k, g, kh before and after u, before j, 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 = [k<sup>w</sup>]; 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)kintó̱m 'hundred': Skt. šatá̱m, Av. satóm, OCS sê̱to, Lith. šimtas, Gr. hekató̱n (he- from *(d)-), Lat. centum, Goth. hund.  
PIE *gerh₂- 'to be old': Skt. járánt-, Av. zuarvūan- 'old age' (the first -u- is secondary), OCS zvē̱tī 'to ripen', Gr. gé̱rōn 'old man'.  
PIE *uegh₂- 'to carry, to ride': Skt. vâhatī, Av. vazaiti, OCS vezp, Lith. vežū, Gr. ókho̱s 'wagon', Lat. vehō, Goth. ga-wigan 'to move'.  
PIE *kruh₂-, *kruh₂- 'flesh, blood': Skt. kraviś, Av. xrūra- 'bloody', OCS kr̥v̥, Lith. krau̱jas, Gr. krē̱as, Lat. crōr, OE hrēaw 'raw'.  
PIE *leug- 'light': Skt. rōka-, Lith. laūkas, Gr. leukós, Lat. lux, OE lōht.  
PIE *kʰoinēh₂- 'price': Av. kaenā 'punishment', OCS cēnā, Lith. kainā, Gr. poinē 'punishment' (from which Lat. poena and thence E. pain).
Comparative

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[hi]d[hi]. 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).

Exercise 2
Reconstruct the PIE obstruent from which the bold-face consonant is derived:

a. Gr. érebos, Goth. riqis, Skt. rājas- ‘darkness’

b. Lat. fugere, Gr. pheúgō ‘to flee’, Skt. parí-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. amhú-

e. Skt. pāṣu, Lat. pecu ‘cattle’

f. Skt. gāti- ‘moving’, Goth. qumps ‘arrival’

g. Skt. dih- ‘to smear’, Lat. fingo ‘to knead’, Goth. digands ‘kneading’.

h. Skt. cára-, Gr. péломai ‘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 more-
over that there are no indications for the existence of either *sk or *skʷ. For example:
Lith. skirti ‘to divide’, OHG sceran ‘to cut, shave’; cf. Gr. keírō. This probably means
that *k 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)kedánnũmi ‘to scatter’).
In the case of such an alternation the s-less variants sometimes display a reflex
of the original palato-velar (cf. Skt. sípti- ‘shoulder’, MLG schuʃt ‘withers’ < *(s)kupt-).
Usually, however, these forms have k, for example Russ. kora, Lith. karnā ‘bark’, which
are connected with the above-mentioned Lith. skirti. 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 ĭgo, Gr. zugón, Lat. iugum, Goth. juk); PIE *h₂eug- ‘to increase, to multiply’. This
renders it likely that both *k and *kʷ became *k after *u.

Thirdly, we often find the k-sounds immediately before r, for example Skt. kravīś,
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’ < *kleu-os
(Gr. kléos, Skt. śravas) as against Lith. klausyti ‘to hear’ < *klou-. The existing alterna-
tions 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 y only when there was no front vowel following (hence klausyti < *klou-,
but slovo < *kleu-).

It is to be expected that such alternations could lead to the generalization of one
of the original variants. Thus, OCS srądbce ‘heart’ < *krd- would have gotten its s (we
would expect k before r) from the nominative *kėrd (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. srądbce above), but that *m
did not (OCS soto, Lith. ūmtas < *(d)kmtom).

Depalatalization is also thought to have occurred before laryngeals (at least before
*h₂) already in PIE, cf. Skt. khidāti, 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. kreón ‘ruler’) and śmāśru-‘beard’ (Lith. smâkraś), with inexplicable -sr-. There is also Skt. ruśant- ‘clear, radiant’ with ś < *k after u, for which no explanation seems possible. Lith. šlaunis ‘shinbone’ (Skt. śróni-) from *klou- (to which OHG hlau̯n 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 *kēr-, enlarged as *kieu- ‘to set into motion or to be in motion’ (Skt. cyávate, Av. šiauauaitē < *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 assimilate 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. s, 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  \( k^l : k^w \) is doubly marked, since an opposition \( k : k^w \) or \(  \kappa : k \) 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 \(  \kappa \) 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 \( r \) 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) \( (p^h, t^h, k^h, \text{etc.}) \). 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.

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Yet these correspondences were only found in a few words. Also, the number of cases with (supposed) *\( th^h \) 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. *\( tis\text{-}\text{thati} \) ‘to set’ < *\( ti\text{-}st\text{-}h_2\text{-}e\text{-}ti \), where the laryngeal is shown by the root *\( st\text{-}a\text{-} = *\( st\text{-}eh\text{-} \)

Skt. *\( pr\text{-}th\text{-}u\text{-} \) ‘broad’ (Gr. *\( pl\text{-}th\text{-}u\text{-} \), as appears from fem. *\( pr\text{-}th\text{-}iv\text{-}i \) with -\( i \) < *\( h_2 \) ) and the Greek place-name *\( Plataia\text{-}i \) (fem. pl.) from *\( pl\text{-}ta\text{-}u\text{-}j\text{-}a \) < *\( pl\text{-}th\text{-}u\text{-}i\text{-}h\text{-} \).

Note that Greek did not develop aspiration from *\( th\text{-} \).

Perhaps \( k + \) laryngeal gave \( x \) in Slavic:

Russ. *\( so\text{-}x\text{-}a \) ‘(wooden) plow’, Lith. *\( sak\text{-}a \), Skt. *\( s\text{-}akh\text{-}a \) ‘branch’, Goth. *\( ho\text{-}ha \) ‘plow’ < *\( ko\text{-}\text{-}ok\text{-}\text{-}H\text{-}? \)
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 *bh became voiceless (Siebs’ law):

Skt. skhálati ‘to stumble’, Arm. sxalem ‘to wander away’, Gr. sphállo as opposed to Lat. fallō < *(s)gw-.

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

Skt. kákhati ‘to laugh’, Gr. kakházō, Arm. xaxank’, OCS xoxtō.

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 pb bh was the series p b bh. As against the latter system it was argued that it is hardly found in any known language. One finds systems with pb instead of bh, or with bh and pb together. The reason is that p b pb displays fewer distinctive features: p and b differ as − and + voice, p and pb as − and + aspiration. In the traditional reconstructed system of PIE the bh 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 bh 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 *g), but veh-ō : vēc-tus (with *gh). The solution is that the glottal stop (ʔ) of the g = ’k lengthens the preceding vowel: aŋ-g-tos > ātus. The glottal stop, then, has the same lengthening effect as a laryngeal, cf. eh₂C > 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. ésti (< *e’d-ti) has a long vowel è. 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. mėžiu ‘to milk’, Gr. amélgō, PIE *h₂melg-.) 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-dhā-ti ‘to set’, reduplicated present
pres. bōdh-a-ti ‘to be awake, observe’ from *bʰeuđh-, 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. ḷ-ḏh > ḷ-. ḷ > t – th:

tí-thē-mi ‘to put’ from *ḏh₁-i-dh₁h₁-
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- < *segh₁-, but fut. hék-s-ō

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

gen. sg. trikh-ōs ‘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. *drugh- ‘to deceive’, verbal adjective *drugdhá- < *drugh-tó-

OAv. *auga-dá ‘he said’ from *augh- *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. -aōy-ţá shows the same process before s: *augh-sa > *augža.

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’ro- etc. (e.g. OIr. *criathar, Lat. *cribrum ‘sieve’ from *kredi-tro- and *kreid-ro-, respectively): *-d’h- would have arisen from *-t- after an aspirate (note that there is no variant -d’ro-).

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’dT > T’t), as is phonetically understandable.

**Exercise 3**

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

a. Skt. *yoddhár ‘fighter’; compare Skt. *dhátár ‘creator’ to dhā ‘make, create’
e. Skt. *dōgdhi ‘he milks’ (< *-t), Goth. *daug ‘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:

<table>
<thead>
<tr>
<th>PIE</th>
<th>PGM.</th>
<th>Armenian</th>
</tr>
</thead>
<tbody>
<tr>
<td>p</td>
<td>t</td>
<td>k</td>
</tr>
<tr>
<td>b</td>
<td>d</td>
<td>g</td>
</tr>
<tr>
<td>bh</td>
<td>d’h</td>
<td>g’h</td>
</tr>
<tr>
<td>f</td>
<td>p</td>
<td>χ</td>
</tr>
<tr>
<td>g</td>
<td>t</td>
<td>k</td>
</tr>
<tr>
<td>g’h</td>
<td>p</td>
<td>t</td>
</tr>
<tr>
<td>h</td>
<td>t’</td>
<td>s</td>
</tr>
<tr>
<td>g</td>
<td>t</td>
<td>c</td>
</tr>
</tbody>
</table>

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, b, 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, *k, *kʷ which are voiced stops or spir-
rants (b/b, d/d, g/g, gʷ/gʷ) instead of the voiceless spirants (f, ʰb, 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. *brohár ‘brother’ < *bʰreh₂tēr, but
*fadar (d = d) < *ph₂tēr. The Danish scholar, Karl Verner, discovered the solution for
this difference when he compared the accentuation of Skt. bhrátā and pitā: 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 syll-
able 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. vēda), whereas the ending
was accented in the plural (Skt. vidmā). This difference can be found back in the Ger-
manic preterit, for example OHG sg. kōs : pl. kurum, OE cēas : pl. curon < Gm. *kauś :
Original r < *z remains only in was : were.

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

*þorkos ‘pig’: Lat. porcus, Lith. pažas, OHG far(a)h, OE fearh
*pokrō- ‘fitting, fair’: Goth. fags, OS OHG fagar, OE fægr, MoE fair
*snusōs ‘daughter-in-law’: Skt. snuṣā, Gr. nuōs, Lat. nurus, Olc. snor, OHG snur(a),
OE snoru.
*ʊérte/o- ‘to turn’: Skt. vārtate, Goth. wairpān, OFr. sertha, OHG werden ‘to be-
come’
*uortēie- ‘to make turn’: Goth. fra-wardjan ‘to destroy’ (fra-wairpān ‘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:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td><strong>filhan</strong> ‘to hide’, <strong>fulgins</strong> ‘hidden’</td>
</tr>
<tr>
<td>b.</td>
<td><strong>aih</strong> ‘I possess’, <strong>aigum</strong> ‘we possess’</td>
</tr>
<tr>
<td>c.</td>
<td><strong>sandjan</strong> ‘to send’, <strong>sinps</strong> ‘road’</td>
</tr>
<tr>
<td>d.</td>
<td><strong>af-lifnan</strong> ‘to remain’, <strong>bi-laibjan</strong> ‘to leave’</td>
</tr>
<tr>
<td>e.</td>
<td><strong>wizon</strong> ‘to wallow’, <strong>wisan</strong> ‘to gorge’</td>
</tr>
<tr>
<td>f.</td>
<td><strong>ana-mindeis</strong> ‘suspicions’, <strong>ga-minbi</strong> ‘recollection’</td>
</tr>
</tbody>
</table>

### Exercise 5
Reconstruct the PIE obstruents from which the bold-face consonants are derived:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Goth. <strong>tunbus</strong>, Skt. <strong>dánt</strong>-, Gr. <strong>odónt</strong>- ‘tooth’</td>
</tr>
<tr>
<td>b.</td>
<td>Gr. <strong>méthu</strong>, English <strong>mead</strong></td>
</tr>
<tr>
<td>c.</td>
<td>Arm. <strong>otn</strong>, English <strong>foot</strong></td>
</tr>
<tr>
<td>d.</td>
<td>Av. <strong>mazga</strong>-, Dutch <strong>merg</strong> ‘marrow’</td>
</tr>
<tr>
<td>e.</td>
<td>Arm. <strong>tasn</strong>, Gr. <strong>déka</strong> ‘ten’</td>
</tr>
<tr>
<td>f.</td>
<td>Goth. <strong>qino</strong>, OCS <strong>žena</strong> ‘woman’</td>
</tr>
<tr>
<td>g.</td>
<td>Lat. <strong>centum</strong> ‘hundred’, Goth. <strong>hunda</strong> ‘hundreds’</td>
</tr>
<tr>
<td>h.</td>
<td>OS <strong>bar</strong>, English <strong>bare</strong> ‘naked’, Lith. <strong>básas</strong> ‘barefoot’</td>
</tr>
<tr>
<td>i.</td>
<td>Goth. <strong>sibun</strong>, Av. <strong>hapta</strong>, Lat. <strong>septem</strong> ‘seven’</td>
</tr>
</tbody>
</table>

### 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 (*b*) 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* > *h* (Grimm) > *d* (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:

\[
\text{PIE } *p, *t, *k^{(w)}, *s > \text{PGm. } *b, *d, *g^{(w)}, *z \text{ before the accent}
\]
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, *dh*) 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- < *kweit-nō- (Skt. śvetā-, śvītā- ‘white’)
- **PIE *d** MHG stutzen ‘to bump’ < PGm. *stuttōn- < *(s) tud-nēh₂- (Lat. tundō, Skt. tudāti ‘to thrust’)
- **PIE *dh** OE botm, MoE bottom < PGm. *buttma-. Leveled from a paradigm nom. *budmēn, gen. *buttaz < nom. *budh₂n-mēn, *budh₂n-(m)n-ós (Skt. budhná-, Gr. puthmén ‘bottom’; in the gen. *dhnmn 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. svefn, Lat. somnus (< *swepanos) ‘sleep’

b. OE lician, Du. liken ‘to lick’, Gr. likhneô, Lat. lingô (< *lign-)

c. OE clǣt ‘clot-bur’ (a plant) (< *klai-), Lat. glūten ‘glue’ (< *glott-n-)

d. Goth. aþn(s) ‘year’ (< *aþna-), Lat. annus (< *atnō-)

e. Goth. diups, E. deep (< *deupa-), CS dhno ‘bottom’ (< *bhno-), Olr. domain ‘deep’ (< *bhnī-)

**Relative chronology**

The reinterpretation of Verner’s Law as *t > *d and the identical result which *t and *dh 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 > *tt and *d (no change in the system)

(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 *pʰ 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, *tʰ, *d) less spectacular.

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

<table>
<thead>
<tr>
<th>PGm.</th>
<th>OHG</th>
<th>OHG between vowels</th>
<th>PGm.</th>
<th>OHG</th>
<th>PGm.</th>
<th>OHG</th>
</tr>
</thead>
<tbody>
<tr>
<td>*p &gt;</td>
<td>pf</td>
<td>ff</td>
<td>*b &gt;</td>
<td>p</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*t &gt;</td>
<td>z [ts]</td>
<td>zz</td>
<td>*d &gt;</td>
<td>t</td>
<td>*p &gt;</td>
<td>d</td>
</tr>
<tr>
<td>*k &gt;</td>
<td>kch</td>
<td>hh, ch</td>
<td>*g &gt;</td>
<td>k</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Du. werpen ‘to throw’, OHG werpfan
OS opan ‘open’, OHG offan
Goth. taihun ‘ten’, OHG zehan (PGm. *teʰun < PIE *dekʰm)
Goth. itan ‘to eat’, OHG ezzan (PGm. *etanan < PIE *h₁ed-)
Goth. dauhtar ‘daughter’, OHG tohter (PGm. *duʰtʰer- < 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 *p > 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. *l̥edonom > NHG lassen, E. let
b. *tod > NHG das, E. that
c. *lip-ēh₁ > NHG leben, E. live
d. *genh₁,̣tis > NHG Kind (Swiss dial. Kchind)
e. *dn̥h₁u- > NHG Zunge, E. tongue
f. *kʰ₂s-ẹ́n- > E. hare

Exercise 8
Reconstruct the PIE stops to which the bold-faced consonants go back:

a. NHG helfen, E. help
b. NHG Zahl ‘number’, E. tale
c. NHG Storch, E. stork
d. NHG stossen, Goth. staustan ‘to thrust’
e. OHG zihan ‘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 *kt would normally yield Skt. ṣṭ. The correspondences are:
Comparative

<table>
<thead>
<tr>
<th>Skt.</th>
<th>Av.</th>
<th>Gr.</th>
<th>PIE</th>
</tr>
</thead>
<tbody>
<tr>
<td>kṣ</td>
<td>xš</td>
<td>kt</td>
<td>*-k-</td>
</tr>
<tr>
<td>kṣ</td>
<td>š</td>
<td>kt</td>
<td>*-k-</td>
</tr>
<tr>
<td>kṣ</td>
<td>z</td>
<td>khth</td>
<td>*-gʰ-</td>
</tr>
<tr>
<td>kṣ</td>
<td>(d)j /_i</td>
<td>phth</td>
<td>*-gʷh-</td>
</tr>
</tbody>
</table>

(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. táksan- ‘carpenter’, Av. tašan-, Gr. téktôn (Lat. texō ‘to weave’, OHG dehsala ‘cover’)
Skt. jkṣa- ‘bear’, Av. arōṣa-, Hitt. hartagga-, Gr. árktos, Lat. ursus, Arm. arǰ (< *arj + *-iō-)
Skt. kṣinóti ‘to destroy, to decay’, Gr. phthínō, cf. Skt. śrágas 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 *h, 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 *dʰgʰ/*dʰgh-. The original order, dental-velar, is also confirmed by Toch. A tkm (Toch. B. kəm). For ‘bear’ Hitt. hartagga- (a wild animal) points toward *h₂rtk̑ō-. For Skt. kṣi- OAv. dājīt.arata- /djītarta- ‘destroying Arta’ points toward *dʰgʰw̞-h-. The consonant cluster was apparently simplified in a number of different ways. Thus, the Sanskrit genitive for ‘earth’ is jmās, Greek has khamai ‘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. kṣēti, OAv. šaēti ‘inhabits’, Gr. ktizó ‘to found’

b. Lat. pecten ‘comb’, Gr. kteis, gen.sg. ktenós; compare Lit. pēšu ‘to pull out (hair)’, Gr. pēkó ‘to comb’

c. Gr. phthánō ‘to be beforehand’, Skt. daghyās ‘you may reach’
11.4 PIE *s

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>s¹</td>
<td>s, h²</td>
<td>s³</td>
<td>s, h, O⁵</td>
<td>sh, gj⁶</td>
<td>s⁷</td>
<td>s, h, O⁸</td>
<td>s, r⁹</td>
<td>s¹⁰</td>
<td>s¹¹</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. š 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 *h₂.
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 sēdēti, Lith. sēdėti, Gr. hēdōs, Lat. sedeō, Goth. sitan, E. to sit
PIE *ues-* ‘to clothe oneself’: Skt. vāste, Av. vaste, Arm. (z-)gest ‘piece of clothing’, Alb. vesh, Toch. A wsāl, Toch. B wasti ‘piece of clothing’, Hitt. wess- ‘to dress’, Gr. heīma < *ues-mm, Lat. vestis (E. vest is a loanword)
PIE *bʰośo-* ‘bare(footed)’: OCS bōs̥, Lith. bāsas, Arm. bok (<bʰośo-go-), OHG bar, OE bær
PIE *-su loc. pl. ending: Skt. āsvā-su, but agnī-ṣu, sūnā-ṣu, vāk-ṣu, pitṛ-ṣu; OCS tro-xō, synō-xō (anal. -a-xō); Alb. abl.pl. -sh.
PIE *st(ē)h₃-mm-* ‘jaw’: Hitt. ıstāman- ‘ear’, Gr. stôma ‘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 > *ś 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, i, u (consonantal) and r̥, l̥, m̥, n̥, i̯, u̯ (vocalic), respectively.

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

\[ r, l, m, n > r, l, m, n \]

but \( l > \text{IIr. } r \)

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 \( j \) and \( u \) was as follows:

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<tbody>
<tr>
<td>( i )</td>
<td>( y )</td>
<td>( y )</td>
<td>( j )</td>
<td>( j )</td>
<td>( \emptyset )</td>
<td>( gj^-), ( \emptyset^2 )</td>
<td>( y )</td>
<td>( y^3 )</td>
<td>( z, h, \emptyset^4 )</td>
<td>( i, \emptyset^6 )</td>
<td>( \emptyset )</td>
<td>( j )</td>
</tr>
<tr>
<td>( u )</td>
<td>( v )</td>
<td>( v )</td>
<td>( v )</td>
<td>( v )</td>
<td>( g, v^1 )</td>
<td>( v )</td>
<td>( w )</td>
<td>( w )</td>
<td>( w, h, \emptyset^5 )</td>
<td>( v )</td>
<td>( v, \emptyset^7 )</td>
<td>( w )</td>
</tr>
</tbody>
</table>

1. mostly \( g \) but \( v \) when word-final after apocope.
2. \( gj^- \) in anlaut, \( \emptyset \) 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 \( \emptyset \).
5. \( h \) and zero in anlaut, \( w \) in dialects, Myc. \( w \).
6. \( \emptyset \) between vowels.
7. \( f^- \) in anlaut, \( \emptyset \) intervocalic; British \( gw^-\), \(-w^-\).

PIE *leigʰ- ‘to lick’: Skt. réhmi, OCS lizati, Lith. liežiū, Arm. liz(an)em, Gr. leikhô, Lat. lingô, OIr. ligim, Goth. (bi-)laigon, OS likkon (\(< *ligʰ-n-*)

PIE *iekʰr ‘liver’: Skt. yâkr-t, Av. yakara, Lith. jėknos, Gr. hêpar, Lat. iecur

PIE *ue/oikʰ-, uikʰ- ‘place of habitation’: Skt. viś-, Av. viś, OCS vōś, Lith. vięš-pats ‘lord of the house’, Gr. (w)oikos, Lat. vicus

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. -bhyaś in such cases must be read as -bhiaś. 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 /i/ < */-ija-*) < *kerdʰio-. 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 holtjaz < *hultjaz (heavy stem) < *kld-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 */j/* is reflected in old, unproductive forms (e.g. mésos ‘middle’ <
*medʰios, óneiros ‘dream’ < *h₃.nerios), 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 */-ih₂o- (probably an extension of the suffix */-ih₂- ‘belonging
to’, see 13.2.6b and 13.2.9 on the Latin gen. -i).

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 Rāgveda, Dvārus must often be read Dvārus. 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. kūôn ‘dog’, rather than re-
reflecting a Lindeman form */k(u)yôn, is due to influence of the zero grade ku- in e.g. gen.
*/kᵘ-ᵣós; note that */kᵣôn 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

\[
\begin{align*}
\text{i} & > \text{OCS} \ b, \ \text{Toch.} \ \ddot{a} \\
\text{u} & > \text{OCS} \ > \ \ddot{a}, \ \ddot{a} \\
(b \ and \ \ddot{a} \ as \ i, \ u \ in \ E. \ \text{pit, cut})
\end{align*}
\]

The vocalic form of the other sonants developed as follows:

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<tr>
<td>r</td>
<td>r₁</td>
<td>ər₁</td>
<td>rᵣ, rᵣ</td>
<td>iᵣ, uᵣ</td>
<td>ar</td>
<td>ri</td>
<td>ār⁵</td>
<td>ar</td>
<td>ra⁶</td>
<td>or</td>
<td>ri</td>
<td>aur⁸</td>
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<tr>
<td>l</td>
<td>r₁</td>
<td>ər₁</td>
<td>lᵣ, lᵣ</td>
<td>iᵣ, uᵣ</td>
<td>al</td>
<td>āl³</td>
<td>al</td>
<td>la⁶</td>
<td>ol</td>
<td>li</td>
<td>ul</td>
<td></td>
</tr>
<tr>
<td>m</td>
<td>a²</td>
<td>a²</td>
<td>ə</td>
<td>i₃, u₃</td>
<td>am</td>
<td>a</td>
<td>ām⁵</td>
<td>am</td>
<td>a²</td>
<td>em</td>
<td>em⁷</td>
<td>un</td>
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<tr>
<td>n</td>
<td>a²</td>
<td>a²</td>
<td>ə</td>
<td>i₃, u₃</td>
<td>an</td>
<td>a</td>
<td>ān⁵</td>
<td>an</td>
<td>a²</td>
<td>en</td>
<td>en⁷</td>
<td>un</td>
</tr>
</tbody>
</table>

1. -r > -ar; stressed *fp, *fk > YAv. ahrp, ahrk, *ft > YAv. əš.
2. am, an before sonant.
3. BSl. had *ir, ur etc. (*ur after labiovelar). This became Slav. *br, *f, etc.; *mn, *vn > * (at the end of the word > -v). In OCS *br and *fr merged in *r, which is written as *rb or *r.  
4. Lith. *ir as against *ir < *H.  
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.  

PIE *krd- ‘heart’: Skt. gen. hṛḍās (h- anal.), Av. zṛṛḍai- (z- anal.), OCS srōdye, Lith. širdis, Hitt. gen. kardiyas, Gr. kradiē (kard- anal.), Lat. cor, cordis, OIr. cride (Goth. hareito from the nom. *kērd)  
PIE *gʰmţi- ‘going, coming’: Skt. gāti-, Gr. básis, Lat. con-vetiō, Goth. ga-qumþs, OHG cumf  
PIE *h- ‘un-, not-’: Skt. á-jñāta- ‘unknown’, Arm. ancanawt’, 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 *R 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 *H (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. vīlka, OCS vlěk, Av. vahrka ‘wolf’

b. Goth. munþs ‘mouth’, Lat. mentum ‘chin’, Welsh mant ‘jaw’

c. OCS *mn̥x, OE snuþ ‘daughter-in-law’

d. Gr. ónoma, Skt. námā, OCS ēm, Lat. nōmen ‘name’

e. Skt. óśāmī, Lat. ūrō ‘I burn’

f. OIr. óc, Skt. yuvaśa- ‘youth’, Lat. iuvencus ‘bullock’

g. Av. ýasta-, Gr. zóstos ‘girded’

h. Breton hen, Lith. sēnas, Arm. hin ‘old’

i. Arm. gorc, Gr. érgon ‘work’

j. Lat. posco (< *pork-skō), OHG forsca ‘I ask’ (< Gm. *furh-skα-), Lith. pištī ‘to engage’

k. Skt. údhr, Gr. oūthar ‘udder’

l. Skt. matih ‘thought’, Lat. mens, gen. mentis ‘mind’, OCS pa-měþ ‘recollection’
11.6 The vowels

11.6.1 The short vowels (*e, *o)

PIE had only two vowels: e and o.

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<tbody>
<tr>
<td>e</td>
<td>a</td>
<td>a</td>
<td>e</td>
<td>e</td>
<td>e, je, ja3</td>
<td>ā4</td>
<td>e, i, a5</td>
<td>e</td>
<td>e</td>
<td>e</td>
<td>i7</td>
<td></td>
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<tr>
<td>o</td>
<td>a1</td>
<td>a1</td>
<td>o</td>
<td>a, u2</td>
<td>a</td>
<td>A, a, Be</td>
<td>ā, a6</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>a</td>
<td></td>
</tr>
</tbody>
</table>

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 *medhōn ‘honey drink, mead’; Skt. médhu, OCS medv, Lith. medūs, Gr. méthu, OIr. med (i < e because of -*u*), OE med
PIE *kʷoteros ‘who of both’; Skt. katará- (short first a analogical), OCS kotoryja, Lith. katrás, Gr. póteros, Goth. hwapar (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 *gōnū ‘knee’; Skt. jānū, Av. zānū, Arm. cūnr, Toch. kanwemē/kenime, Gr. gōnū (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 *h₂e.*

For instance, in anlaut an a- which interchanges with o- or zero can be easily explained as deriving from *h₂e-*. We are therefore dealing with the normal ablaut sequence e/o/Ø:

- *a/o in Gr. ákros ‘highest’, ókris ‘tip, point’ from *h₂e-/h₂o-
- a/Ø in Lat. agō, gerō from *h₂eγ-*, *h₂e-γ-
- a/i in Gr. aithós ‘sparkling’, itharós ‘clear’ from *h₂eidʰ-/h₂jdhʰ-
A frequent ending for which *-a was previously reconstructed was the 1 sg. perfect, Skt. -a, Gr. -a. Lycian -χα (and Hitt. -hum < *-ha + -un) indicates that -a goes back to -h₂e. This explains, moreover, the difference between:

Skt. 1 sg. pf. ja-gám-a < *gʷe-gʷom-h₂e

and

Skt. 3 sg. pf. ja-gám-a < *gʷe-gʷom-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 /eukhetoil, ‘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 -h₂, which was the actual ending; Skt. -ai will be the thematic form with -o- + this -i. Gr. -mai, -mān must be based on *-mah₂-i, *-mah₂-m, of which *-mah₂ is the regular development from -mh₂ (see 11.9.5). This means that Greek has added -m before the ending -h₂ (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. kākhāti ‘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 (*ē, *ō)

The long vowels had a completely different status from the short ones. The ‘real’ PIE long vowels *ē and *ō 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 ē and ō turn out to reflect sequences of short vowels plus a laryngeal, such as ē from *eh₁ and ō from *eh₂, or *oH. Apparent long ā was in reality *eh₂, and long i and ũ always go back to PIE *iH, *uH.

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<td>o</td>
<td>ē</td>
<td>ē, e³</td>
<td>ē</td>
<td>ī</td>
<td>ē₁</td>
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<td>ā</td>
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<td>u</td>
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<td>ō</td>
<td>ō</td>
<td>ā, ū</td>
<td>ō₁</td>
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1. Lith. ē, OIr. ī, Goth. ē, o are long vowels.
2. disputed; perhaps word-internal *ē > A a / B e, *ō > ā/ā; final *-ē > -ā, *-ō > -u
3. ē and ā when stressed, e and a when unstressed.
4. ū in final syllables.

PIE *kērd ‘heart’: Skt. hārdi (with anal. h-), Arm. sirt, Gr. kēr
PIE *mēh₂tēr ‘mother’: Skt. mātā, Lith. mōtē, Arm. mār, Alb. motēr (‘sister’), Toch. mācār / mācēr, Gr. mētēr, Lat. māter (ē shortened before -C), OIr. māthir, OHG muoter, E. mother
PIE *nēpōt(s) ‘grandson’: Skt. nāpāt, Lith. nepūtis, Alb. mbesē ‘niece’ < *nepōtiā, Lat. nepōs, nepōtis, W. nei (with -i < -ī < -ō in final syllables); OE nēfā ‘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 h₂ when juxtaposed with e: h₂ei, eh₂i > ai.
1. aē in open syllables, ū before s 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 = [i].

PIE *h₁ei-ti 'he goes'; Skt. ēti, Av. aēiti, OP aītīy, OLith. eītī, Gr. eīsi, Lat. ēt
PIE *snoi̯gos ‘snow’: Skt. snehāyati ‘to cover with snow’, OCS śnéga, Lith. sniēgas, OPr. snaygis, Goth. snaius, E. snow
PIE *deuk- ‘to carry’: Lat. dūcō, Goth. tiuhan, OHG ziohan, OE tēon
PIE *h₂eus ‘ear’: NP hōs, OCS uxo, Lith. ausis, Lat. auris, OIr. āu, ṭ, Goth. auso, OHG ōra, E. eār

11.7.2 The long diphthongs

Long diphthongs were very rare. They consisted of combinations of long ē or ŏ with i or u in one syllable (thus, before consonants or at the end of a word). PIE ē, ŏ 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 *-o’ei), and we will disregard them here. Since PIE *eh₁jē 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.

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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 *dēiōst ‘he showed’ (s-aor.): Av. dāiš, Gr. deikō; *-léikwst > Skt. -raik; *kʷēitst > OCS ēis³
PIE *-ōis (-oh₁eis?) instr. pl.: Skt. víkais, Av. wahrkāiš, OCS vloky, Lith. vilkaiš, Gr. lýkois (theoïs), Lat. lupīs
PIE *-ēi loc. sg.: Skt. agná, Goth. anstai
PIE *-ōi nom. sg.: Skt. sákha, YAv. haxa; Gr. peithó
PIE *-ēu loc. sg.: Skt. āktu, OCS synu, Lat. noctu, Goth. sīnau

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 Ilr. -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. fémina ‘woman’ is derived from the root *dʰeh₁i- ‘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:

b. Lat. *hostis*, Goth. *gæsts* ‘guest, stranger’
c. OIr. *ech*, Lat. *equus*, Skt. *āśva*—‘horse’
d. Welsh *nos*, Lith. *naktis*, Skt. *nāk*—‘night’
e. OIr. *fedim*, OCS *vesti*, Av. *vad*—‘to lead’
g. Goth. *raudus* (< *raudaz*, OIr. *ríad*, Lat. *rubidus*—‘red’

Exercise 12
Explain the following bold-faced vowel correspondences in view of the basic principles of PIE ablaut (Section 12.2):

a. Goth. *liugan* versus OCS *bogati*—‘to lie’
b. Goth. *uf-panjan*—‘to expand’
   Lat. *tenère*—‘to hold’
c. OCS *snēga*—‘snow’
   Lat. *nix*, gen. *nīvis*
d. Lat. *pons*—‘bridge’, Av. *pantā*—‘road’
   Skt. *pathās*—‘road’ (gen.), OPr. *pintis*

11.8 The laryngeals

The discovery of the three phonemes now called laryngeals (*h₁, h₂, h₃*) 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 *h₁, etc., or previously as *ə*, 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 (*dʰæn* = *dʰeŋ₁*) and roots which appeared to begin with a vowel had a laryngeal: *aŋ* = *h₂eŋ*, *ed* = *h₁ed*. Hence all Indo-European roots had the structure *CeC* (*e = e/o/O*) (see Chapter 12).
Chapter 11. The Sounds and the Accent

The phonetic reality of the 'laryngeals' is uncertain. It is possible that \(*h_1^i\) was a glottal stop (ʔ), \(*h_2^i\) a pharyngeal (ʕ, known from Arabic) and \(*h_3^i\) 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:

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<tr>
<td>CHC</td>
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1. development as with \(*c*.
2. development as with \(*\check{c}\*.
3. development as with \(*\bar{a}\*.
4. seldom \(\varnothing\).
5. \(i\) in the final syllable, \(\varnothing\) in inlaut, \(i\) in initial syllable before CC.
6. \(y, ei = [i]\)
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 \(*\check{e} > -\bar{a}\)
    \(eh_2 > a/o\)
    \(eh_3 > \bar{a}/\bar{a};\) final \(*-\bar{o} > -\bar{u}\)
11. \(ha, ha\) in initial position.
12. \(h < \*h_2\)
13. Ion.-Att. \(\check{e}\), except after \(e, i, r\).
14. \(\bar{u}\) in final syllables
15. \(\varnothing\) in inlaut.
11.8.1 Laryngeal between consonants

In Greek we see \( h_1 > e, *h_2 > a, *h_3 > o \) (but \( \emptyset \) before and after \( i ? \)), in Indo-Iranian all laryngeals become \( i \) or \( \emptyset \), whereas the other languages have \( a \) or \( \emptyset \).

PIE \( *ph_2 \) \( *\text{ter} \) ‘father’: Skt. pitá, Av. \((p) tā \) (dat. piθrē), Arm. hayr < \( *hāpir \), Toch. pācar/pācer, Gr. patēr, Lat. pater, OIr. athir, Goth. fadar

PIE \( *ish_1 \) \( *\text{ros} \) ‘holy’: Skt. isirā-, Gr. hierōs < \( *i\text{herōs} \)

PIE \( *dh_3 \) \( *\text{tos} \) ‘given’: Gr. dotōs, Lat. datus

PIE \( *dh_2 \) \( *\text{tēr} \) ‘daughter’: Skt. duhitā, Av. dugōdā, OCS došti, Lith. duktė, Arm. dustr, Toch. ckācar/ıkācer, Gr. thrugātēr, 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 \( \emptyset \), unless they are restored, in which case they yield \( a \).

PIE \( *h_1 \) \( *\text{rudhros} \), \( *h_1 \) \( *\text{roudhos} \) ‘red’: Skt. rudhirá-, OCS rudh-, Lith. raūdas, Toch. rtārē/rātē, Gr. rūthrōs, Lat. ruber, OIr. rūad, Goth. raufi̯s, E. red

PIE \( *h_2 \) \( *\text{me} \) ‘me’: Skt. mā, OCS mę, OPr. mien, Arm. im < \( *\text{em-} \), Alb. mē, Hitt. ammuk, Gr. emē, Lat. mē, Goth. mīk, E. me

PIE \( *h_2 \) \( *\text{ues} \) ‘to sojourn, remain’: Skt. vāsati, Arm. gov (Armenian has no vowel before \( *u \)), Hitt. huiszi, Gr. aor. āesa < \( *\text{aues-} \), MW gwest (gw- < \( *u \)) ‘place to rest’, Goth. wisan, cf. E. was

PIE \( *h_3 \) \( *\text{n(e)d} \) ‘to taunt’: Skt. nindati (with \( n \)-infix), Arm. anicanem (a- < \( *o \)), Lith. niedėti, Gr. òneidos, Goth. ganaitjan

In Greek there are no cases known of \( Hī- \) > \( Vj- \). It has been argued that \( Hī- \) gave Gr. \( h \) whereas plain \( *j \) yielded \( z \)-: Gr. husmínē ‘battle’ < \( *Hiudh- \) (to Skt. amitrāyūdh- ‘fighting the enemy’ < \( *\text{amitra-Hyudh-} \) vs. zugón ‘yoke’ < \( *\text{iugom} \). 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 *h₂ remained in anlaut as h-, as did probably also *h₃ (both perhaps only before e, not before o). The Armenian h- can perhaps be explained in this way too.

PIE *h₁es- ‘to be’: Skt. ásmī, OCS jesmbo, OLith. esmi, 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 *h₂es- ‘against’: Skt. anti, Hitt. hanti, Gr. antí, Lat. ante

PIE *h₃es- ‘sheep’: Skt. ávi-, OCS ovca-, Lith. avis, Arm. hoviw ‘sheep-herder’ < *h₃es-peh₂-, Luw. havî-, Gr. ōis, Lat. ovis, W. eig < *owī-kā, Goth. awistr, OHG ehwist ‘sheepfold’ < *awi-st(r)o-, OHG ouwi < PGm. *aujō, E. ewe

PIE *h₂oiu ‘a long time’: Skt. ēyu (o in open syllables > ā), Gr. ou ‘not’ (from *ne … *h₂ou); cf. Lat. aevum < *h₂iuom

In inlaut after a consonant in Indo-Iranian both voiceless and voiced obstruents became aspirated; in Hittite it seems that a geminate developed.

PIE *plth₂u- ‘broad’: Skt. pṛthū-, Av. pārthu-; Gr. plátus, OIr. lethan < *lítano- < *plth₂-no-( -th- < t is an OIr. lenition)

PIE *-th₂e ending 2pl.: Skt. -tha, Av. -thā, Hitt. -teni, Gr. -te

PIE *meg-h₂- ‘great’: Skt. gen. mahás < *magʰ-; Hitt. mekki-; Arm. mec, Gr. mégas, Goth. mikils, OE micel < *meg-; Alb. madh < *mğ-

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 *-eh₂-es nom. pl. ā-(= eh₂)stems: Lith. -os, Goth. -os (both o < *ā)

In Indo-Iranian such forms are often still disyllabic in the oldest poetry: Skt. bhās ‘light’ = /bhaas/ < *bh₂h₂-os.

The sequence -eh₂ie- became -ai:-

PIE *deh₂i-uer- ‘husband’s brother’: Skt. devār-, OCS dēverb, Lith. dieveris (acc. dierver”), Arm. taygr, Gr. dāér (< *daiyēr).

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 h₂ remains as h before s.

PIE *seh₁- ‘to sow’: OCS séṅ, Lith. séju, Lat. sēmen, OIr. síl, Goth. mana-sēþ ‘world, humankind < human seed’, E. seed

PIE *peh₂- ‘to protect’: Skt. pāti, Hitt. paḥs-zi, Lat. pātask

PIE *poh₂iu ‘herd’ (from the same root *peh₂-): Skt. pāyū- ‘protector’, Gr. poū
PIE *deh₂ - ‘to give’: Skt. dādāmi, dānam ‘gift’, OCS dati, dar, Lith. dūoti, Gr. didōmi, dòron, Lat. dōnum
PIE *piHuon - ‘fat’: Skt. pívan-, Gr. pión-
PIE *dʰuHmo - ‘smoke’: Skt. dhūmā-, Lat. fūmus, Lith. dūmai (pl.), OCS dým - ‘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. catus ‘pointed’, OIr. cath ‘wise’, Skt. šitá ‘sharp’
b. Gr. anéra, Skt. náram ‘man’ (acc.sg.)
c. Gr. érebos, Goth. riqís, Arm. erek ‘darkness’
d. Skt. rōghu ‘light, fast’, E. lung, Gr. elakhūs ‘little’
e. Gr. ostéōn, Hitt. hastāi, Av. astī ‘bone(s)’
f. Lat. tagāx ‘touchy’, Gr. tetagón ‘having caught’, OE þaccian ‘to touch lightly’
g. Lat. axis, Lith. ašis, OCS osb, NHG Achse ‘axis’
h. Gr. káptō, Lat. cāpiō, Goth. hafja ‘I heave’
i. Lat. spūman (< *spōima), Skt. phēna-, OE fām (< PGm. *faima) ‘foam’
l. Lith. výras, Skt. virā ‘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’ (pacificor ‘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.
Chapter 11. The Sounds and the Accent

CrHC, CIHC, CmHC, CnHC

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<td>ro/ro</td>
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CrHV, CIHV, CmHV, CnHV

| rH  | i/ur | ar | v/ov | i/ur | ar | ār/ar | ar | ar | ar | aur3 |
| lH  | i/ur | ar | v/ol | i/ul | al | āl/al | al | al | al | ul |
| mH  | am | am | v/om | i/um | am | ām/am | am | em | am | um |
| nH  | an | an | v/ōn | i/ūn | an | ān/an | an | en | an | un |

1. ūr in the neighborhood of labials.
2. ur in the neighborhood of labiovelars.

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 (ř > ĭr). Balto-Slavic also has the same development, but with an acute accent (instead of a circumflex; Scr. ř as opposed to ř < r̥ in the OCS texts the accent is not given; Lith. ĭr as opposed to i̯r < r̥). Skt. ā comes via aH from mH. In Italo-Celtic we find řH > raH > rā, in Greek the laryngeal determined the vowel: r̥h̥ > reh̥ > rē, etc.

PIE *plh₁no- ‘full’: Skt. pūrnā-, OCS pl̥n̥o, Scr. pūn, Lith. pilnas, OIr. lān, Goth. fulls < PGM. *fūlnas, E. full


PIE *tlh₂tō- ‘carried’: Gr. tlätōs, tlētōs, Lat. lātus, W. tlawd ‘arm’ (aw < ā)

PIE *kmh₂tō- ‘which has cost labor’: Skt. śāntā- (with anal. -n-), Gr. polū-kmētos ‘which has cost much labor’

PIE *strh₂-nō-, -tō- ‘laid down’: Skt. stīrṇā-, Gr. strōtōs, 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 *mh₂krōs ‘large, great’: Hitt. maklant-, Gr. makrōs, Lat. macer, OHG magar

The sequence -ih₂ in anlaut usually yielded -ī, but in Germanic -ya after short vowel + single consonant (wrakja, but bandi < *-ī), PToch. *-yā (B lānštys ‘queen’), Gr. -ial- ĭa:
PIE *potnih₂ ‘mistress’: Skt. patnī, Gr. pótnia
PIE *(bʰer)-ont-ih₂ ‘(bear)ing’ fem.: Skt. bhárantī, OCS nes-ôšti (anal. for *-ôti),
Lith. neš-anti, Gr. phér-ousa < *-ont-ja, 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 $h₂$.

PIE *kmh₂-e/o- ‘to be tired’: Gr. aor. é-kam-on, kámatos ‘tiredness’ < *kmh₂-etos
PIE *th₂-e/o- ‘carry’: Gr. pl. tálanta ‘talent’, Goth. ðulan ‘put up with, suffer’, OE polian
PIE *gʷrh₂-u- ‘heavy’: Skt. gurú-, Gr. barús, Goth. kaurus (Goth. aur < *ur)
PIE *tnh₂-(e)u- ‘long, thin’: Skt. tanu-, OCS tvek̑o, Gr. tanaós, Myc. tanawos, Lat.
tenuis, OIr. tane < *tanawio-, Oic. ñunnr, 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 *HRC*). In Sanskrit we find HNC > HaC > aC. Latin probably had e/a/oNC, but always a- with -rC-, -lC-.

PIE *h₁nun ‘nine’ in compounds: Gr. *enyu > ená/-einá-etes ‘nine years long’
PIE *h₂mbʰi ‘around, surrounding’: Skt. abhi, Alb. mbi, Gr. ampli, Lat. amb-(ire),
Gaul. ambi-, OIr. imb- < *amb-, OHG umbi, G. um
PIE *h₁nogʷh- ‘nail’: Lat. unguis (u- < o-), OIr. ingen < *an-; cf. *h₂nogʷh-: OCS noga
‘leg, foot’, Lith. nāgás, Gr. ónux, OHG nagal, E. nail

Hi/uC- in anlaut. Here we find initial i-, u- in all languages, even in Greek: íthi ‘go!’ < *h₁i-dʰi, itharós ‘clear’ < *h₁idʰ-. But before *u, Greek seems to show vocalization: audé ‘voice’ < *h₂udH-h₁- (full grade would be *h₂uedH- > *awed-, cf. aëdón ‘nightingale’ < *h₂uēdH-). Certain proof for au- is hard to find, however, since a full grade (*h₂eu-) is often conceivable. In Hittite, *h₂i-, *h₂u- give hi-, hu-.

eHNC produced ēNC in Greek, but in Indo-Iranian a(H)aC with $a < N$:

PIE *meh₁ns ‘month’: Skt. mās, Av. mā = /maahl/, Gr. Lesb. gen. mēnno < *mēns-
os; cf. Lith. mėnuo, Goth. menôps, E. month

Since the loss of *H and the syllabification (or not) of *n were clearly post-PIE changes, a notation as *meh₁ns is incorrect and would only lead to confusion.
Chapter 11. The Sounds and the Accent

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. *gratus* ‘pleasant,’ Skt. *gūrtāḥ* ‘famed’
b. Skt. *ánti,* Lat. ante ‘before,’ Hitt. *hant-∗front’
c. Lat. *ventus,* Skt. vātas, Av. vāta- (metrically /vāata-/) , Goth. *winds* [NB: Osthoff’s Law] ‘wind’
d. Lat. crābrō ‘hornet’ < *krāsrōn,* Lith. *širšuō* (for *širšuo*), Dutch horzel.
e. Skt. bhrātar-, OIr. bráthir, Lat. frāter ‘brother’
f. Gr. brakhūs, 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. nābhi- ‘hub; navel,’ OE *nabula* | Gr. *omphalos* ‘navel’ [< *onphalos]* |
| b. Goth. *letan* ‘to let’ | Goth. *lats* ‘slow,’ Lat. *lassus* ‘tired’ |

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/accents, 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 *phorâs* acc. pl. as against *phorâs* 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 *ā* in open syllables disappeared, that in Tocharian A and B an unaccented *ā* became *a*, and that in Tocharian B an accented *ā* 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*, *argēntum*), and otherwise the third syllable counting from the end (*pūeri*). 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 *udaṭṭa*, while unaccented syllables were called *anudaṭṭa*; *svārita* was the word used to describe the pitch drop that took place after the *udaṭṭa*. The so-called ‘independent svarita’ came into existence because of the disappearance of the syllable with the *udaṭṭa*, but the metre of the Rigveda indicates that this syllable was still there when the Rigveda was composed, for example *nadyās < nadyāyas*.

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 (ante-penultimate) could only be accented if the last syllable was a short one; the accent would then be an acute one (*ánthrópos* but *ánthrópou*). 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 (*dórōu*, but *dórōn*). 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. *gunaīka*, but Dor. *gunaika*). Aeolic drew the accent as far back as the ‘limitation law’ would allow (*óúranós* : Att. *óúranos*; *ámme* : Att. *hémeis < *hémé-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 < *ph₂tér*, but *brophar < *bʰrēh₂tēr*. The accent system which this presupposes, agrees with that of Sanskrit and of Greek (Skt. *pītā, bhráṭā; Gr. *patér, phrátēr*).
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 ir, ūr, etc.)

The Latvian forms are given below between parentheses. In Latvian, according to the newest insights, the situation is as follows (‟broken tone, „sustained tone):

<table>
<thead>
<tr>
<th></th>
<th>unstressed</th>
<th>old stress</th>
<th>retracted stress (metatony)</th>
</tr>
</thead>
<tbody>
<tr>
<td>acute syllable</td>
<td>‟</td>
<td>„</td>
<td>’</td>
</tr>
<tr>
<td>non-acute syllable</td>
<td></td>
<td></td>
<td>„</td>
</tr>
<tr>
<td>in non-initial syllable we find „ instead of ’</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 (‘) is due to retracted stress.)

sēti (sēt) ‘to sow’ < *sēh₁-
*éstī (ēst) ‘to eat’ < *h₁ed-
vēmti (veṁt) ‘to vomit’ < *uēmh₁-
mēļziu ‘I milk’ < *h₂melg-
īrti (iṛt) ‘to row’ < *h₁rh₁-
šīrd-ī acc. sg. (šīṛds) ‘heart’ < *kṛd-

A non-acute vowel, then, reflects an old long vowel (ē, ō) or a diphthong which was not followed by a laryngeal:

dūktē ‘daughter’ < *d₃ugh₂tēr
peňktas (piekts) ‘fifth’ < *penk₂tos
šīmtas (simts) ‘hundred’ < *kmtōm

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 *raṅkā (cf. gen. raṅkos) > *rankā (> ranka) with a shortening of the acute vowel in the final syllable: Leskien’s law). The ending was originally -eh₂ and thus acute. A laryngeal between vowels disappeared before acute intonation developed as such, e.g. gen. sg. galvōs < *-eh₂es.

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: eRe etc. results from the non-acute forms, but eŘe from the acute ones. For example:

PIE *gʰorḥos: Lith. garδas, Russ. gořod ‘city’ (OCS gradā)  
PIE *kolh₂mos: Latv. salims, Russ. soloma ‘reed’

As we have already seen (Section 11.8.5), the same opposition survives in Serbo-Croatian in the accentuation ř (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 *dʰuHmós ‘smoke’: Skt. dhūmā-, Gr. thūmós, Lith. dūmëi, Latv. dūmi  
PIE *plHnos ‘full’: Skt. pūṛṇā-, Lith. pilnas, Latv. pilns
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):

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom. sg.</td>
<td>liepa</td>
<td>rankà</td>
<td>galvà</td>
<td>(ziemà)</td>
</tr>
<tr>
<td>gen. sg.</td>
<td>liepos</td>
<td>(rañkos)</td>
<td>galvòs</td>
<td>(ziemòs)</td>
</tr>
<tr>
<td>nom. pl.</td>
<td>liepos</td>
<td>(rañkos)</td>
<td>gálvos</td>
<td>(zièmos)</td>
</tr>
<tr>
<td>acc. pl.</td>
<td>liepas</td>
<td>rankàs</td>
<td>gálvas</td>
<td>ziemàs</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>A</th>
<th>B</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skt. svásā</td>
<td>pitá</td>
<td>Gr. dótòr</td>
<td>patèr</td>
<td>poimèn</td>
<td></td>
</tr>
<tr>
<td>svásāram</td>
<td>pitáram</td>
<td>dótòra</td>
<td>patéra</td>
<td>poiména</td>
<td></td>
</tr>
<tr>
<td>svásre</td>
<td>pitré</td>
<td>dótòros</td>
<td>patrós</td>
<td>poiménos</td>
<td></td>
</tr>
</tbody>
</table>

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. patèr, poimèn.)

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. *gʷém-ti-s, gen. *gʷm-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 jǔṣṭi-, but śruṣṭi-? It is also not the case that the initial accent goes together with a full-grade of the root; we find Skt. gáti- < *gʷnti-, and tanti-, while we would expect to see *gatí- and *ánti-.

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 (id, hi; 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 *teubʰ- and *beutʰ- 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-ère ‘to be warm’, OCS tep-lostь ‘warmth’
b. Skt. sák-t, Gr. kópr-os ‘excrement’
c. Skt. jāmbh-a ‘tooth’, Gr. gómph-os ‘pin’, OCS zób-“These ‘tooth’
d. Lith. aug-ti, Goth. auk-an ‘to grow’, Lat. auc-tor ‘seller’
e. Skt. bāhūs, Gr. pēkhus, Aeol., Dor. pākhus, Olc. bōgr ‘arm’
f. Av. bar-āmi, Gr. phér-ā, Lat. fer-ō, OIr. bir-u ‘I carry’
g. Skt. gām (acc.sg.), Gr. (Dor.) bōn (acc.sg.), Umbrian bum (acc.sg.) ‘cow’
h. Gr. pērd-ō, OHG feř-an, Russ. perd-ět ‘to fart’
i. Goth. sok-jan ‘to seek’, Gr. hēg-éomai ‘to lead the way’, Lat. ság-us ‘prophetic’
k. Hitt. kuen-zi, Skt. hán-ti ‘kills’, Lat. of-fen-d-ō ‘to strike against’
l. Skt. drōgh-ā ‘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-These ‘guest’
o. Skt. ksiti-ı, Av. šiti-, Gr. ktisi-s ‘settlement’
p. Lat. torp-eō ‘to be numb’, Lith. tifsp-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. děrk-omai (pres.), dédork-a (pf.), édrak-on (aor.), Skt. da-dárś-a (pf.) ‘to look’
d. Skt. dārm-ati ‘runs’, Gr. é-dram-on (aor.) ‘ran’, dróm-ōs ‘walk’
e. Gr. orég-ō ‘to stretch’, Av. rāz-iiia ‘to make right’, Skt. rj-ū-, Av. araz-u-, G. rech-t ‘right’
f. Av. vā-ti, Gr. dē-si ‘to blow (of the wind)’, Hitt. huy-ant- ‘wind’
g. Skt. śávi-ra- (< *-ira-), Av. sū-ra- ‘strong’, Gr. á-ku-ros ‘without authority’
h. Gr. tēre-sśen ‘pierced’, trē-tōs ‘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. mṛti-, Av. mărati-, Lat. mors, -tis, Lit. mirtis, OCS (sъ-)mṛstu ‘death’
d. Skt. áyas-, Lat. aes, Goth. aiz ‘metal’
f. Lit. šlaunis ‘hip’, Lat. clūnis, Skt. šróṇi- ‘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. *pleh₁, dʰuh₁s
b. *gʷh₁dʰeloH
c. *dʰeug’oH
d. *kʷelsom
e. *h₁elnbʰos
f. *h₂meig’oH

e Exercise 21
Find the Sanskrit outcome of the following PIE forms by applying the sound laws you know.

a. *menos
b. *kʷekʷlo-
c. *bʰoreie
d. *dʰuHmosio
e. *nkrh₂to-
f. *bʰudʰto-
g. *liliḥusīH-
**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. *gwéntis
b. *pelu
c. *léikwonom
d. *goltós

**Exercise 23**

Provide the correct outcome of the PIE forms as requested:

a. PIE *nébhôs > Greek …
   Avestan …
b. PIE *gûstis > Sanskrit …
   Gothic …
c. PIE *prhjmos > Latin …
   Lithuanian …
d. PIE *troid- > 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.
<table>
<thead>
<tr>
<th>PIE</th>
<th>PGmc.</th>
<th>WGmc.</th>
<th>OE</th>
<th>ME</th>
<th>ModE</th>
</tr>
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<tbody>
<tr>
<td>p</td>
<td>f, b¹</td>
<td>f, [v]²</td>
<td>f, v</td>
<td>f, v</td>
<td></td>
</tr>
<tr>
<td>t</td>
<td>p, d¹</td>
<td>p, [θ]²</td>
<td>d</td>
<td>th [θ/ð]</td>
<td></td>
</tr>
<tr>
<td>k</td>
<td>k, g³</td>
<td>h, Ø</td>
<td>h, w</td>
<td>h, w, wh [M]³</td>
<td></td>
</tr>
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<td>χw, gw¹</td>
<td>χw, Ø</td>
<td>h, w</td>
<td>h, w, wh [M]³</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>p</td>
<td></td>
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<td>d</td>
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<tr>
<td>g</td>
<td>k</td>
<td>k, c³</td>
<td></td>
<td>k, ch [c]</td>
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<tr>
<td>gw</td>
<td>kw</td>
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<td>b, v</td>
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<tr>
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<td>d, [θ]²</td>
<td>d</td>
<td>d</td>
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<tr>
<td>gh</td>
<td>g</td>
<td>g, y², y³</td>
<td>g, y</td>
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<tr>
<td>gw²h</td>
<td>gw²</td>
<td>g, w</td>
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<tr>
<td>s¹</td>
<td>s</td>
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<td>s, [z]</td>
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</tr>
<tr>
<td>z¹</td>
<td></td>
<td>r</td>
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<td>r</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>a, Ø (see vowels)</td>
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<td></td>
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<tr>
<td>r, l, m, n</td>
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<td>r, l, m, n</td>
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</tr>
<tr>
<td>i, u</td>
<td>y, w</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

1. *p, t, k* remain unshifted after *s; b, d, g, gw², 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, y* elsewhere; in Old English the allophones *v, ð and z* were not expressed in writing.
3. *c, 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 < *pôd*-; father < *ph₂tér*; over < *uper*; seven (cf. Goth. sibun, Lat. septem)
- PIE *t* > *p*, ð: three < *tréies*; brother < *b³r̥h₂tér* (Skt. bhrátar-)
- PIE *k* > χ > h- before vowel: horn < *kṛn*- (Lat. cornu) lost before *r, l, n*, between vowels, and finally: ring < OE hring < PGmc *χrëngaz; lean* < OE hēonan (cf. Lat. (in)clināre); slay < OE slēan < PGmc *slaχan*-; high < OE hēah < PGmc *χauχa*- χs > ks: ox < OE ox < PGmc *oχsan*- < *uksén (Skt. ukṣá) χt > t: eight < OE eahtha < *oktṓ (Skt. aṣṭau)
\(\chi j > \chi \chi > f: \) laugh < OE hlæhhan < PGmc *χlæxjan-

PIE *kʷ > kʷ > w, \([\alpha]:\) what < OE hwæt < PGmc *χwat < *kʷod; lost between vowels: Ewood (place-name “water-wood”) < OE ēa- < *aχwa (cf. Lat. aqua); see < OE són < PGmc *seχʷanan (cf. Goth. saiwan, Lat. sequor); lost before \(t:\) night < OE neaht < PGmc *naχt- < *nokʷt-; bilabial element lost before rounded back vowel: who < OE hwâ < PGmc *χwaz < *kʷos

PIE *b > p: apple < OE æppel < PGmc *apla- < *h₂ebl- (cf. Russ. žábloko)

PIE *d > t: two < *duoi-; foot < *pōd-

PIE *g > k: yoke < *(H)iugom (cf. Lat. iugum); chin < OE cinn < WGmc *kinn- < PGmc *kenw- < *gʷenw (cf. Gr. gέnus ‘lower jaw’)

PIE *gʷ > kʷ: queen < *gʷén- (cf. Goth. qens); cf. OE cwómon ‘came (pl.’) < *gʷēm-
> k- before (Gmc) rounded vowel: come < Gmc *kʷum- < *gʷm-
> k: sink (cf. Goth. siggán)

PIE *bʰ > b: brother < *bʰrēh₂fér; bind < *bʰendʰ- (Skt. bandh-)
> v: give < *gʰebʰ- (cf. Goth. giban)

PIE *dʰ > d: daughter < *dʰugh₂fér; door < OE duru < *dʰur- (cf. Gr. thúrá)

PIE *gʰ > g: girdle < OE gyrdel < PGmc *gurd-ilō < *gʰrdʰ-
> ng [ng] > ny: tongue < *dngʰu; Gmc g (from *gʰ) was palatalized if preceded or followed by a front-vowel: way < OE wēg < *wěgʰ-; may < OE mæg < *magʰ-; yard < OE geard < *gʰerdvʰ- (cf. Goth. (bi)gaird)

PIE *gʷʰ > gʷ > g: sing < *sengʷʰ- (cf. Gr. omphé ‘voice’ < *songʷʰ-eh₂-)
> w: snow < *snoigʷʰos

PIE *s > s: sing (see previous item)
> z: choose < *geus-
> z > r: were < OE wāeron < PGmc *wēzum from PIE root *h₂ues-; frore (dialect) ‘frozen’ < *frus-
> sk > sh: show < PGmc *skauwōjan- (cf. Gr. thuò-skóos ‘priest’ < ‘observing the sacrifice’); shire < *skeir- (cf. OHG sciaro); fish < *piskis occasionally šk > ks: (be)twixt < *dʒisk- (cf. G zwischen)

PIE r, l remained unchanged

PIE m, n disappeared before voiceless fricatives: wish < OE wýscan < PGmc *wunsk- < *unHsk- (cf. G Wunsch); five < *penkʷe (cf. Goth. fimf)

PIE i = y: yoke < *(H)iugom

PIE u = w: work < *uerg-
Chapter 11. The Sounds and the Accent

<table>
<thead>
<tr>
<th>PIE</th>
<th>PGmc</th>
<th>WGmc</th>
<th>OE</th>
<th>ME</th>
<th>ModE</th>
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<tr>
<td></td>
<td>$a$</td>
<td></td>
<td>$o+N$</td>
<td>$a/o+N$</td>
<td>[$\text{æN}, \text{òN}$]</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>$a, \text{æ}$</td>
<td>$a$</td>
<td>[$\text{æ}, \text{æ}, \text{è}$]</td>
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<tr>
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<td>$\text{eh}_2$</td>
<td>$a$</td>
<td>as above</td>
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<tr>
<td></td>
<td>$\text{è}$</td>
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<td>$\text{è}$</td>
<td>$\text{è}$</td>
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</tr>
<tr>
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<td>$u$</td>
<td>$u$</td>
<td></td>
<td>$\text{æ}$</td>
<td></td>
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<tr>
<td></td>
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<td>$\text{è}$</td>
<td>$\text{è}$</td>
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<td>$\text{ô}$</td>
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<td>$\text{è}$</td>
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<td>$\text{è}$</td>
<td>$\text{è}$</td>
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<td>$i$</td>
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</tr>
<tr>
<td></td>
<td>$\text{uH}$</td>
<td>$\text{ù}$</td>
<td></td>
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<td>[$\text{æu}$]</td>
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<tr>
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<td>$\text{i}$</td>
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<td></td>
<td></td>
<td></td>
<td>$\text{è}$</td>
<td></td>
<td>$\text{æ}$</td>
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<tr>
<td></td>
<td>$\text{oi}$</td>
<td>$\text{ai}$</td>
<td>$\text{è}$</td>
<td>$\text{è}$</td>
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<td></td>
<td>$\text{è}$</td>
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<td></td>
<td>$\text{eu}$</td>
<td>$\text{eo}, (\text{iù}^6)$</td>
<td>$\text{èo}$</td>
<td>$\text{è}$</td>
<td>$\text{è}$</td>
</tr>
<tr>
<td></td>
<td>$\text{ou}$</td>
<td>$\text{au}$</td>
<td>$\text{èa}$</td>
<td>$\text{è}$</td>
<td>$\text{è}$</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>$R^9$</td>
<td>$\text{uR}$ (see PGmc $u$)</td>
<td></td>
<td></td>
<td></td>
<td>($\text{oR}$)</td>
</tr>
</tbody>
</table>

1. $i$ by $i$-mutation
2. $e$ by $a$-mutation
3. $y$ by $i$-mutation ($\text{OE } y = \text{ù}$)
4. $o$ by $a$-mutation
5. $\text{è}$ by $i$-mutation
6. $\text{ò}$ before nasals
7. $\text{è}$ (17th c.), $\text{i}$
8. $\text{è}$
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:**

$a > \text{à}$ (OE $\text{noma} — \text{ME name}$); $i, e > \text{è}$ (OE $\text{wicu} — \text{ME wèke ‘week’}$, OE $\text{etan} — \text{ME ète ‘eat’}$; $o > \text{ò}$ (OE $\text{nosu} — \text{ME nòse}$).

OE $\text{cild} — \text{ME cild}; \text{OE gold} — \text{ME göld}; \text{OE hund} — \text{ME hûnd}; \text{OE blind} — \text{ME blind}; \text{OE comb} — \text{ME còmb}$
shortening:
  cf. holy vs. holidy; child vs. children; keep vs. kēpt; dream vs. drēamt

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

<table>
<thead>
<tr>
<th>ME</th>
<th>Chaucer</th>
<th>Shakespeare</th>
<th>Now</th>
</tr>
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<tbody>
<tr>
<td>ī</td>
<td>[fiː]</td>
<td>five</td>
<td>[faiː]</td>
</tr>
<tr>
<td>ē</td>
<td>[meːd]</td>
<td>meed</td>
<td>[miːd]</td>
</tr>
<tr>
<td>ē</td>
<td>[kleːn]</td>
<td>clean</td>
<td>[kleːn]</td>
</tr>
<tr>
<td>ā</td>
<td>[naːm]</td>
<td>name</td>
<td>[neːm]</td>
</tr>
<tr>
<td>ŏ</td>
<td>[goːt]</td>
<td>goat</td>
<td>[goːt]</td>
</tr>
<tr>
<td>ŏ</td>
<td>[roːt]</td>
<td>root</td>
<td>[ruːt]</td>
</tr>
<tr>
<td>ū</td>
<td>[duːn]</td>
<td>down</td>
<td>[dauːn]</td>
</tr>
</tbody>
</table>

Some examples and additions:

PIE *h₂ > Ø: daughter < OE dohtor < *dʰuth₂tēr
               > ā: father < OE fēder < *ph₂tēr
PIE *h₂e > ē: acre < OE æcer < Gmc *akraz < *h₂eǵros (cf. Lat. ager)
PIE *o > ŏ: comb < OE comb/camb < PGmc *kambaz < *gombreōs (cf. Gr. gómphos)
               > [a₁]: night < OE niht < *nokʷt- (OE generalized the i-mutated vowel, beside ‘normal’ neahct; so too might, cf. G Macht)
               > ē: eight < OE eahta < PGmc *aχtō < *oktōu
PIE *e > e: melt < OE meltan < PGmc *maltjan < *mold-
               > ē: eat < ME ēte(n) (lengthening) < OE etan (cf. Lat. edō)
PIE *i > [i]: fish < *pisk-
               > ē: (a-mutation): nest < *nisdo-
               > ī: beetle < OE bitula < *bʰidʰ-
               > [a₁] in monosyllables: my < Gmc *miz; by < OE bi < *bʰi
PIE *u > [a]: son < OE sunu
               > [i]: fill < OE fyllan (i-mutation) < PGmc *fulljan < *plH-
               > ŏ (lengthening in open syllable): over < *uper (OHG ubir, Skt. upārī)
PIE *R > ū > /uR/: un- < *n-; us < OE ūs < PGmc *uns < *ns
PIE *ǭ > ū: foot < OE fōt < *pōd-
The Sounds and the Accent

> ĕ: feet (pl.) < PGmc *fôtiz

PIE *eh₂ > ĕ: beech < OE bêče (i-mutation) < PGmc *bôkiōn (cf. Lat. fâgus)
> /ʌ/ (shortening): brother < OE brôhor < *bʰrēh₂tēr

PIE *ē > ĭ: seed < OE sæd < *seh₁- (cf. Lat. sēmen)
> /ʌ/: mouth (shortening) < OE mônap < *meh₁n-

PIE *iH > /aɪ/: swine < OE swīn < *suH-iHno (cf. Lat. suīnus)
PIE *uH > /aw/: mouse < OE mûs < *muHs

PIE *ei > /aɪ/: bite < OE bītan < *bʰeidiH-

PIE *oi > ď: home < OE hām < PGmc *haimaz < *koin- (cf. Gr. koimáō 'go to sleep')
> ĭ: reach < OE ræčan < PGmc *raikjan
occasionally ū: two < OE twā < *duoi

PIE *eu > ĭ: freeze < OE frēosan < *preus-; steer < OE stīeran (i-mutation) < Gmc *stiurjan
> ū: choose < ME chōsen (with incidental shift of accent) < OE čēosan < *géus- (Skt. jóśati, Gr. geúomai); similarly lose < OE léosan < *leus-

PIE *ou > ĭ: ear < OE ēār < PGmc *aurôn- < *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/O/ɛ/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, *kerh₂- ‘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 *gʰeud- ‘to pour (as into a mold)’, (Gr. kéō) next to *gʰeud- (Goth. giutan, OE gēotan, Lat. fu-n-d-ō). The -d- is called a ‘root enclitic’. 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 **pekr is not possible since r is more sonorous than *k. A seeming exception are the roots in -i (more rarely in -u), for example *peh₂-i- ‘to drink’; but here, -i- did not originally form part of the root but was a suffix, *peh₂-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 *steiagnosth-.
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/i/ɪ/ɒ, for example: -en/-en/-n/-ên/-ën/-ôn; -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-, -mh₁n-, -tuh₂t-. These forms have originated from two or more suffixes (-i-Hn-, -m-h₁n-, -tu-h₂t-).

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-, -eh₁, -sk-.

12.1.3 The endings

Nominal endings have the form eC: nom. pl. -es, gen. sg. -os/-s. Some have no ablaut vowel: -bh₁/-su.

Verbal endings often have the form -Ce: 1 pl. -me, 2 pl. -te, 1 sg. pf. -h₂e. The forms -CCe (2 sg. pf. -th₂e) 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 (*h₁ég- ‘I’) we often find the structure (C)Ce: *so ‘this’, *h₁me ‘me’, *kʷe ‘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)ε ‘he sprinkled’. Alongside Skt. páśyati ‘to see’ we have Skt. spás- ‘spy’, Av. spasieiti, Lat. speciō. There are many such examples, but the meaning of *s- is unclear.


There is only one infix, the *-n- in presents: Lat. iung-ð, ‘to tie together’, Skt. yunj-< *(H)jɪu-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 *gʰi ‘for, indeed’;
   e. conjunctions: *-kʷe ‘and’, *-ue ‘or’;
   f. interjections (*ai = *h₂eit?).

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. *h₁eŋg-
f. *bleu-
g. *ged-
h. *gnesl-
i. *rpolk-
j. *sieh₁,
12.2 Ablaut

12.2.1 Introduction

Ablaut (from German *Abstufung der Laute*; vowel alternation) is the alternation between *e/o/O/ē/ō*. The difference between *e* and *o* (and between *ē* and *ō*) is called qualitative ablaut, whereas that between *e, O* and *ē* (and between *o, Œ* and *ō*) is called quantitative ablaut. Other terms are:

<table>
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<th></th>
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<th>full grade</th>
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<tbody>
<tr>
<td>e</td>
<td>o</td>
<td>(guna, Voll-/Hochstufe, degré plein);</td>
<td>e-pith-ōmēn</td>
<td></td>
</tr>
<tr>
<td>ē</td>
<td>Œ</td>
<td>lengthened grade</td>
<td>(vrddhi, Dehnstufe, degré long);</td>
<td>é-stikh-on</td>
</tr>
<tr>
<td>Ē</td>
<td>Œ</td>
<td>zero grade</td>
<td>(Null-/Schwundstufe, degré zéro).</td>
<td></td>
</tr>
</tbody>
</table>

Guna and vrddhi are the terms employed by the old Indian grammarians.

12.2.2 The normal series

A few examples of the normal series:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>beid</em>-</td>
<td>Gr.</td>
<td>pelth-ōmai</td>
<td>pé-poith-a</td>
<td>e-pith-ōmēn</td>
</tr>
<tr>
<td>‘to persuade’</td>
<td>Lat.</td>
<td>fid-ō</td>
<td>foed-us</td>
<td>fid-ēs</td>
</tr>
<tr>
<td><em>steig</em>-</td>
<td>Gr.</td>
<td>steǐk-hō</td>
<td>stoǐkh-os</td>
<td>é-stikh-on</td>
</tr>
<tr>
<td>‘to walk’</td>
<td>Goth.</td>
<td>steig-an</td>
<td>stāig</td>
<td>stīgen</td>
</tr>
<tr>
<td></td>
<td>OE</td>
<td>stīgan</td>
<td>stāg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lith.</td>
<td>steig-tī</td>
<td>Latv. staiga</td>
<td></td>
</tr>
<tr>
<td><em>derk</em>-</td>
<td>Gr.</td>
<td>dérk-ōmai</td>
<td>dé-dork-a</td>
<td>é-drak-on</td>
</tr>
<tr>
<td>‘to see’</td>
<td>Skt.</td>
<td>ā-darś-am</td>
<td>dā-darś-a</td>
<td>a-drāś-ran</td>
</tr>
<tr>
<td><em>suep</em>-</td>
<td>Olc.</td>
<td>svef-n</td>
<td>Lith. sāp-nas</td>
<td>OCS s[̥]-n[b]</td>
</tr>
<tr>
<td>‘sleep’</td>
<td></td>
<td></td>
<td></td>
<td>Gr. hūp-nos</td>
</tr>
</tbody>
</table>

In ‘sleep’ the Lithuanian form lost the -u-. Skt. svāpna 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 *h₂* and *h₃*, 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/Œ*:
Laryngeal before e/o/Ø:

| *h₂eγ- 'to lead' | *h₂oγ- | *h₂γ- |
| Gr. ἀγω, Lat. ago | Gr. ōgmos | Lat. gerō < *h₂γ-es- |

| *h₂eγ- | *h₂eγ- |
| Lat. augeō, Skt. ójas- | Ugrā- |

| *h₂ei-u 'a long time' | *h₂oi-u- | *h₂j-(eu-) |
| Lat. aevum | Skt. áyú, Av. āiuu | Av. gen. yaoš |

Laryngeal after a vowel gave:

- \( eh₁ / oh₁ / h₁ \) > \( ē / ō / h₁ \)
- \( eh₂ / oh₂ / h₂ \) > \( ā / ō / h₂ \)
- \( eh₃ / oh₃ / h₃ \) > \( ō / ō / h₃ \)

| *dʰeh₁- | *dʰoh₁- | *dʰh₁- |
| Gr. tithēmi | thómós 'heap' | tithemen (1pl.) |

Roots in *-VH followed by *i present a problem in the zero grade: *ph₂i- from *peh₂i- gave Skt. pítā-. Probably *ph₂i’tó- first became *pih₂tó- 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):

- *temh₁- ‘to cut’: Gr. témenos ‘temple grounds’ (< ‘cut off piece of land’)
- *tomh₁-: Gr. tómos ‘slice’
- *tmh₁-: Gr. tmētōs ‘cut, sliced’
- *gʰeH- ‘to call’: Skt. hávī-tave; háv-ate; OCS zovō (ov < eu)
- *gʰuH-: Skt. hūtá-; ptc. huv-ant-; OCS zov-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 consonant 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:

- \( *h₁d- \rightarrow *h₁ed-, *sm- \rightarrow *sem-, *tk- \rightarrow *tok-, *ut- \rightarrow *uêt-, etc. \)
- \( *dmh₂ \rightarrow *demh₂-, *lis- \rightarrow *lois-, *prt- \rightarrow *pert-, *spk- \rightarrow *spek-, *h₃lh₁ \rightarrow *h₃olh₁-, etc. \)
- \( *strh₃ \rightarrow *sterh₃-, *h₂mrd- \rightarrow *h₂mord-, *strig- \rightarrow *streig-, etc. \)

There are also exceptions to this rule, e.g. *sup- → *suep-, *suop- 'sleep' (never **seup-), *prek- ‘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: *gʷh₁-tós ‘killed’.

The lengthened grade was only found in a restricted number of forms:

1. the nom. sg. of root nouns: *uōkʷs ‘voice’, *kērd ‘heart’;
2. nominal derivatives (originally from roots): *suēkuro- ‘brother-in-law’;
3. the (ind. act. of the) s-aorist: *tuēgʰ-s- ‘to drive’;
4. the ‘static’ presents: Skt. tāsti ‘he does carpentry’, -staut ‘he praised’ < *-stēut;
5. the nom. sg. of the hysterodynamic inflection (see 13.2.4): *ph₂ tér, *h₂ēkmōn ‘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.  *tk₁-         (o)  | d.  *h₁es-       (o)  | g.  *tn₁t-      (e)  |
| b.  *lš₂-        (e)  | e.  *stigʰ-      (Ø)  | h.  *suep₁-     (Ø)  |
| c.  *perk₁-      (Ø)  | f.  *dʰu₁-       (ē)  | i.  *strH₁-     (e)  |

12.3 The origin of the ablaut

There are many indications that the alternation e/Ø was originally dependent on the accent, compare:

| *klēu-os        | Skt. šráv-as | Gr. klé-os |
| *klu-tós       | Skt. śru-tás | Gr. klu-tós |
| *h₁ē₁-mi       | Skt. ē-mi    | Gr. ē₁-mi (< *ē₁-mi) |
| *h₁i-més       | Skt i-más   | (Gr. i-men for *imén) |
| *ph₂-tér-m     | Skt. pi-tár-am | Gr. pa-tér-a |
| *ph₂-tr-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. *bʰereth₁e, 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: (dó)-tór ‘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-)é-s-os for older **(mn)-é-s-s

From cases such as the genitive (*mn-é-s-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:

<table>
<thead>
<tr>
<th></th>
<th>stressed</th>
<th>unstressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. zero phase:</td>
<td>ʰe (ó)</td>
<td>- Ø</td>
</tr>
<tr>
<td>2. o-phase:</td>
<td>ʰe (ó)</td>
<td>- Ø, o</td>
</tr>
<tr>
<td>3. e-phase:</td>
<td>ʰe (ó)</td>
<td>- Ø, o, e</td>
</tr>
</tbody>
</table>

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 (-ői < -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-dōR type (*dēh₂-tōr, Gr. dótōr). As the most original type one would expect CéC-R, with a zero-grade suffix -R after accented ʰe; there are still some traces of it. From the accusative *CéC-éR-m a vowel, which became -o-, was introduced in the suffix of the nominative (*CéC-oR) and was consequently lengthened (*CéC-őR). 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. *h₂ēb-ōl′ apple′
c. nom.sg. *h₂nēr′ man′
d. adj. *ni-pod-ó′ settlement′
e. nom.acc. *nébʰ-os, gen. *nébʰ-ēs-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), *snīgʷh-* ‘snow’ (9.2), *kērd* ‘heart’ (11.6.2, 11.7.3). Another example is:

PIE *muHs* ‘mouse’: Skt. *mús*, OCS *myšb* (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 *mūs-ća*, Lith. *mus-ę*, Arm. *mun* < *mus-no-*, Gr. *muĩa* < *mus-ja*, 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):

<table>
<thead>
<tr>
<th>eC</th>
<th>(e)Co</th>
<th>CeC</th>
<th>C(e)Co</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ek)</td>
<td>ko</td>
<td></td>
<td></td>
</tr>
<tr>
<td>et</td>
<td>(e)to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>es</td>
<td></td>
<td>ies</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ues</td>
<td></td>
</tr>
<tr>
<td>eh₁</td>
<td></td>
<td>ieh₁</td>
<td></td>
</tr>
<tr>
<td>eh₂</td>
<td></td>
<td>ieh₂</td>
<td>ih₂o</td>
</tr>
<tr>
<td>er</td>
<td></td>
<td>ro</td>
<td>ter</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>tro, tero</td>
</tr>
<tr>
<td>(el)</td>
<td>lo</td>
<td>tel</td>
<td>tlo</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>d³lo</td>
</tr>
<tr>
<td>(em)</td>
<td>mo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>en</td>
<td>(e)no</td>
<td>men</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>h₁en</td>
<td></td>
</tr>
<tr>
<td>ei</td>
<td></td>
<td>io</td>
<td>tei</td>
</tr>
<tr>
<td>eu</td>
<td>(uo)</td>
<td>teu</td>
<td></td>
</tr>
<tr>
<td>Ø</td>
<td>o</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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: *iekr̥-r ‘liver’; *h₁ēsh₂-r ‘blood’. Skt. āṣr-, Hitt. eshar, Gr. ēar. Adverbs in -er: *(s)uper ‘above’: Skt. upārī, Gr. húper, Lat. super.

-ro- we find in a number of old words: *h₂egro- ‘acre’; *uiHro- ‘man’. Skt. virā-, Lith. vyras, Lat. vir, OlIr. fer, Goth. wair (the last three with shortened i).

-ro- also forms primary adjectives: *h₂ugrō- ‘strong’. Skt. ugrā-; *h₁rudro- ‘red’.

-ter- in words indicating kinship: *ph₂tēr, and nomina agentis: *gnh₁-tōr ‘conceiver, father’. Skt. janitár-.

-tro- is used for neuters which indicate the instrument: *h₂(e)hra₃trom ‘plough’. Gr. árotron.
-tero-: see the comparative (Section 14.4). Compare also *kʷōteros ‘who of two’ (see Chapter 15).

**n-suffixes**

Single -en- is found in very old words: *uksén ‘bull’: Skt. ukṣá, Goth. auhsa (E. ox). It is often used as a secondary suffix: Skt. rāj-an- ‘king’ (cf. Lat. réx); Lith. žmuō, Lat. homō, Goth. guma ‘human being’ is an *n*-stem derived from *dh₂(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. krṣná-, OCS čr̥n̆ (< *čərmn-); secondary: Lat. aēnus ‘of bronze’ < *h₂eies-no-. Substantives have -no- and -neh₂-: *kwoo-neh₂- ‘price’: Av. kaēnā-, OCS cēna, Gr. poimē.

-h₁-en-, which indicates a person, is found both as a primary and as a secondary suffix: *h₁ju-h₁-en- ‘young’: Skt. yúvan-, Lat. iuvenis; Av. māthrā /manthrāHāl < -*tro-h₁on ‘prophet’ (‘the man of the mantras’).

-men-. Isolated is *h₂ékmōn ‘stone’: Skt. ásmā, Gr. ákmōn. It is also used for agent nouns: Lith. piemuō, Gr. poimēn ‘herder’.

Neuters in -mṇ are frequent: Skt. vásma ‘piece of clothes’, Gr. heima; 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. dōrz-ra ‘strong’, dōrz-i-raḍa- ‘having a strong chariot’
Av. xrūra- (‘kruh₂-ro-) ‘bloody’, xrūma- id., xruui- dru- (< *kruh₂-i-) ‘with a bloody weapon’
Gr. argós (< *argros, Skt. rjrā-) ‘white, quick’, arg-i-kéraunos ‘having a white (flash- ing) lightening’, arg-i-pous ‘quick-footed’
Gr. kūdrós ‘famous, kūd-ìstos, kūdos ‘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.

**Vṛddhi derivatives**

Vṛddhi (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 → ĕ). It is believed by many scholars that one way to make a denominative 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 *deiu- ‘god’ to *diēu- ‘sky(-god)’, and *suēk(u)ro- ‘brother-in-law’ to *suēkuro- ‘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-mānas- ‘with a good mind’ → sau-mānas-ā- ‘benevolence’, āyas- ‘metal’ → āyasā- ‘made of metal’ show a productive long vowel in the first syllable plus stressed -ā-; Av. māzda-iiasna- ‘worshipper of Ahura Mazda’ → māzda-iiasni- ‘of a worshipper of Ahura Mazda’, Skt. sarātha- ‘travelling on the same chariot’ → sārathi- ‘charioteer’ show the same ōrdhṭi plus a replacement of suffixal -a- by -ī-.

Secondly, there are hardly any word equations which can be found between the IE branches. For instance, the *ē in *suēk(u)ro- ‘brother-in-law’ only appears in Germanic, whereas all other branches have *suēkuro- ‘father-in-law’.

There are good alternative explanations for the alleged cases of e-grade derivatives which are present in all branches, such as *deiu- ‘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 (ə-stems) in the individual languages. In the case of ‘sky’, the oldest paradigm will have been nom. *dēi-u, acc. *di-ēu-m (> *diēm by lengthening), gen. *di-u-ōs. 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-ō- 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. kṛṣṇā- ‘black’ vs. kṛṣṇa- ‘black antilope’, ṛpās- ‘active’ vs. ṛpās- ‘work’, Gr. dolikhós ‘long’ vs. dolikhos ‘the long course (in racing)’, Lith. āukštas ‘high’ vs. aukštas ‘floor, storey’.

The PIE process is essentially viewed as a shift in inflectional pattern, either from a static base noun to a prterodynamic adjective, or from a PD noun to a derived HD noun. Thus, to acrostic *krē/ōt-u- ‘insight’ (Skt. krātus) would have been formed
PD *krét-u-/*krt-éu- ‘having mental force’ (Gr. kratús ‘strong’). From PD *séh₁-mn ‘seed’ (Lat. sēmen) a HD derivative *sēh₁-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 bahuvriḥi compounds with neuters as second members, cf. Gr. mēnos, Skt. mānas- n. ‘mind’; Gr. eumenēs, Skt. su-mānas- adj. ‘of good mind’; Skt. dhārman- n. ‘law’: satyā-dharman- adj. ‘of true laws’. Whereas neuters had PD inflection, the compounds, being adjectives, were inflected according to the HD pattern (nom. ādharma, acc. dharmāṇam, 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 Če- or Ci-. The best known word is that for ‘wheel’: Skt. cakrā-, Lith. kāklas ‘neck’ (for *ke-?), Toch. A kukāl, Toch. B kokale, Gr. kuklos, OE hwēol, forms which point to *k*e-kʷl-(o-). The word for ‘beaver’ displays different suffixes and was probably a root noun: Skt. bāhhru-, Lith. bebrūs 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. *bʰi- bʰr, gen. bʰi- bʰ-r-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. nṛ-ḥān- ‘man-killing’.
2. The second element often has -o- in the place of -e-, for example Gr. eu-pātōr ‘from good parents’ as opposed to patēr. 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-pāti- ‘lord, leader of the clan’ the referent is ‘leader’ (pāti-); the word, then, is endocentric. In Skt. ugrā-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. **Bahuvihi**s (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-menēs, Skt. dur-manās ‘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-kā-t- ‘road-builder’; Lat. sacerdōs, -dōt-is < *-dōh₁-t- ‘priest’ (‘he who lays [down] the sacrifice’); Gr. su-bō-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. trasā-dasyu- ‘bringing fear to the enemy (dāsu-’); the referent brings fear. Gr. arkhē-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 co-ordinating compounds, which simply indicate the totality of the two elements, for example Skt. indra-vāyu ‘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. dyāvā-ṛṣṭhivī ‘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. ājñāta- 'unknown'
c. Lat. bi-ped- 'two-footed'
d. Skt. kṣayād-vīra- 'ruling over men'
e. Gr. aleksi-kakos 'warding off evil'
f. Gr. rhodo-dáktylos '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. aksī, Av. aŝi, OCS oĉi, Lith. aki, Gr. ósse, Toch. A ašām, Toch. B eś(a)ne, OIr. di šuíl. 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, h₂-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.

<table>
<thead>
<tr>
<th></th>
<th>sg.</th>
<th>sg.ntr.</th>
<th>pl.</th>
<th>pl.ntr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>Ø, -s</td>
<td>Ø</td>
<td>-es</td>
<td>-h₂, Ø</td>
</tr>
<tr>
<td>voc.</td>
<td>Ø</td>
<td>Ø</td>
<td>-es</td>
<td>-h₂, Ø</td>
</tr>
<tr>
<td>acc.</td>
<td>-(o)m</td>
<td>Ø</td>
<td>-ns</td>
<td>-h₂, Ø</td>
</tr>
<tr>
<td>gen.</td>
<td>-(o)s</td>
<td>-om</td>
<td></td>
<td></td>
</tr>
<tr>
<td>abl.</td>
<td>-(o)s; -(e)t</td>
<td>-ios</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dat.</td>
<td>-(e)i</td>
<td>-mus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>loc.</td>
<td>-i, Ø</td>
<td>-su</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ins.</td>
<td>-(e)h₂</td>
<td>-b²/i</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the neuter the accusative is always identical with the nominative. For an explanation see Section 13.2.10.

The Singular
Nominaive. 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. *ph₂tér-s > *ph₂tér. 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 h₂-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 > *-VR 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 (-n) 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 *-ēr and, in Latin, acc.sg. -em. In the protoderivatic 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 *-ēi. 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 hypothetic dynamic 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. naúphi ‘with the ships’, and Armenian -b) or *-mi (Slavic -mb), 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. *-h₁ is absent from Anatolian, there may have been a Late PIE phonetic change of the ending *-t via *-d to *-h₁ 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 *-ns 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 *-h₂ (> Skt. -i, Gr. -a) which was the nom.sg. of a derived h₂-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 *CēC-ōR of a neuter (and protonerodynamic) stem *CēC-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. dōmata ‘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. loci, but also loca; Gr. mērōs ‘thigh’, pl. mēroi (often du. mērō), 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 -am of Skt. and Avestan a- and ā-stems is sometimes scanned disyllabically as -aHam; this points to a contracted ending *-aH-om of the h₂-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. asmākam, OP amāxam ‘ours’, Lat. nostrum; compare also the Arm. adjectival suffix -c’ < *-skom. Hence, the gen.pl. *-om was originally an adjectival form (cf. ‘ingly’ = ‘of kings”).

**Dative.** Skt. -bhyas resembles Lat. -bus and both could be based, respectively, on -bhios or -bhios. But Latin does not have the -i- 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. -mov 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 -bh-. If the dative had -m- (*-mus) and the instrumental had -bh- (-bh-i), the individual languages could have generalized either -m- or -bh-.
Now *-bʰios and -bʰos 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 -xo 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 *-bʰi 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 *ph₂tér ‘father’ alongside *dʰugh₂tér ‘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 *snusós ‘daughter-in-law’ is feminine (Gr. νύς, Arm. ni; in Skt. snusā, OCS snxha, OE snoru the word has become an ā-stem; Lat. nurus is a u-stem). And *h₁ekui(o)- ‘horse’ is also used for a ‘mare’ (Gr. ἥ ἵππος). 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)eh₂ (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 h₂-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)eh₂ with females (*deiu-os ‘god’, *deiu-ih₂ ‘goddess’; *so ‘he’, *seh₂ ‘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 *eh₂, 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 (V = long vowel, V = short vowel):

<table>
<thead>
<tr>
<th>Hysterodynamic Inflection</th>
<th>Proterodynamic Inflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom. ĒR</td>
<td>*ph₂tēr ‘father’</td>
</tr>
<tr>
<td>acc. VR-m</td>
<td>*ph₂tēr-m</td>
</tr>
<tr>
<td>gen. R-ōs</td>
<td>*ph₂tr-ōs</td>
</tr>
</tbody>
</table>

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 *h₂d-ōnt(s) ‘tooth’, adj. *-uent(s) ‘possessing’.

The neuters and some of the masculine-feminine nouns followed the proterodynamic (hereafter: PD) inflection. The neuter forms had no nom. *-s, acc. *-m. The hysterodynamic (hereafter: HD) inflection displays a number of subtypes:

| nom. CeC-R (1)            | CeC-ōR (2)                | Ce(e)C-ōR (3)                |
| acc. CC-ēR-m             | CC-ēR-ōs                 | Gr. dōtōr                     |
| gen. CC-R-ōs             | CC-R-ōs                  | *ph₂tēr                       |

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 amphiodynamic 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:

<table>
<thead>
<tr>
<th>STATIC INFLECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.  CēC-R       *méh₂-tr</td>
</tr>
<tr>
<td>acc.  CēC-R (-m)  *méh₂-tr-m</td>
</tr>
<tr>
<td>gen.  CēC-R-s     *méh₂-tr-s</td>
</tr>
</tbody>
</table>

In Sanskrit the nominative and the accusative of ‘mother’ have been formed on the model of ‘father’; -ur < *-rs. The suffix stress in Sanskrit is not old, cf. Gr. métēr.

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):

<table>
<thead>
<tr>
<th>HD</th>
<th>m.-f</th>
<th>(k)</th>
<th>t</th>
<th>nt</th>
<th>s</th>
<th>h₁</th>
<th>h₂</th>
<th>r</th>
<th>(l)</th>
<th>(m)</th>
<th>n</th>
<th>i</th>
<th>u</th>
</tr>
</thead>
<tbody>
<tr>
<td>PD</td>
<td>ntr.</td>
<td>s</td>
<td>r/n</td>
<td>(l/n)</td>
<td>n</td>
<td>(i)</td>
<td>u</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>m.-f</td>
<td></td>
<td></td>
<td>(h₂)</td>
<td>i</td>
<td>u</td>
<td></td>
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<td></td>
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<tr>
<td>ST</td>
<td>m.-f</td>
<td></td>
<td>nt</td>
<td></td>
<td>r</td>
<td></td>
<td>(i)</td>
<td>r/n</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>ntr.</td>
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<td></td>
</tr>
</tbody>
</table>
Exercise 29
State the case in which the following reconstructed forms are given:

a. *teut-eh₂-m
b. *deh₂-ur-su
c. *h₁-ṣu-men-ēs(-Ø)
d. *uiH-ro-ns
e. *Hrehi-uent-s
f. *neh₂-u-bʰi
g. *diu-t-ei
h. *nep-t-os
i. *h₂eks-i-om
j. *h₃leig-ios-es

Exercise 30
Provide the correct endings for the following PIE stems (don’t mind the ablaut grade):

a. *ph₂-tr-‘father’ loc.sg.
b. *ped-‘foot’ gen.sg.
c. *gʰebʰ-h₂-‘gift’ gen.pl.
d. *peh₂-un-‘fire’ loc.sg.
e. *nek-u-‘corpse’ nom.sg.m.
f. *dʰugh₂-tr-‘daughter’ nom.sg.
g. *tr-i-‘three’ ins.pl.
h. *h₂eus-i-‘ear’ acc.pl.m.
i. *kHl-et-‘hero’ ins.sg.
j. *seh₁-ṣm-‘seed’ loc.sg.
k. *Hros-h₂-‘dew’ loc.pl.
l. *h₂egʰ-os-‘fear’ acc.sg.n.
m. *h₃neh₂-ṣm-‘name’ dat.sg.
n. *sueh₂-ṣd-u-‘sweet’ dat.pl.

Exercise 31
Determine on the basis of their ablaut grade whether the following reconstructed paradigms are static, proterodynamic or hysterodynamic:

   *hₑui-i-m *nokʷ-t-m *sekʷ-ṣm *h₁i-ent-m *ulkʷ-ieh₂-m
   *h₃u-ei-s *nokʷ-t-s *skʷ-ṣm *h₁i-nt-ṣm *ulkʷ-iH₂-ṣs
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.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>acc. *genden₁-os</td>
<td>*suH-nú-m</td>
<td>*h₂us-ōs-m</td>
<td>*dór-u-s</td>
</tr>
<tr>
<td></td>
<td>gen. *genden₁-ēs-os</td>
<td>*suH-nóu-s</td>
<td>*h₂us-s-ōs</td>
<td>*dér-u-s</td>
</tr>
<tr>
<td></td>
<td>‘race’</td>
<td>‘son’</td>
<td>‘dawn’</td>
<td>‘wood’</td>
</tr>
</tbody>
</table>

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.
### Singular

Nom.sg. *-ón. In some languages the -n in the nom.sg. has disappeared after the long vowel. Nouns with nom.sg. *-én, 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. aiēn ‘always.’ In the other oblique cases, -n- as found in Sanskrit must be old; Greek still has some cases of -n-, e.g. kū-ón, 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 < n). 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 < *-nsi (with the o of the other forms); this form we still find once in phrasi ‘midriff, thoughts’ (which was later replaced by phresi, following nom. phrēn, acc. phrēna). 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 -ór are completely parallel with those in -ón. Those in -ér are especially the kinship terms. Here is their paradigm:

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt. ‘king’</th>
<th>OCS ‘stone’</th>
<th>Lith. ‘stone’</th>
<th>Gr. ‘anvil’</th>
<th>Lat. ‘man’</th>
<th>Goth. ‘man’</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>-ón</td>
<td>rājā</td>
<td>kamę</td>
<td>akmuō</td>
<td>ákmōn</td>
<td>homō</td>
</tr>
<tr>
<td>voc.</td>
<td>-on</td>
<td>rājan</td>
<td>-</td>
<td>akmenē</td>
<td>ákmon</td>
<td>homō</td>
</tr>
<tr>
<td>acc.</td>
<td>-én-m</td>
<td>rājānam</td>
<td>kamęν</td>
<td>ākmenį</td>
<td>ākmona</td>
<td>hominem</td>
</tr>
<tr>
<td>gen.</td>
<td>-n-ōs</td>
<td>rājnas</td>
<td>kamęne</td>
<td>ākmeñs</td>
<td>ākmonos</td>
<td>hominis</td>
</tr>
<tr>
<td>dat.</td>
<td>-n-ēi</td>
<td>rājñe</td>
<td>kamęni</td>
<td>ākmeniu</td>
<td>-</td>
<td>homini</td>
</tr>
<tr>
<td>loc.</td>
<td>-ën(-i)</td>
<td>rājan(i)</td>
<td>kamęne</td>
<td>akmenyjē</td>
<td>ākmoni (dat.)</td>
<td>homine (abl.) gumin (dat.)</td>
</tr>
<tr>
<td>ins.</td>
<td>-n-ēh</td>
<td>rājña</td>
<td>kamęnty</td>
<td>ākmeniu</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
### Plural

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>-eër</td>
<td>pītā</td>
<td>mati</td>
<td>dukṭē</td>
<td>patēr</td>
<td>pater</td>
</tr>
<tr>
<td>voc.</td>
<td>-ēr</td>
<td>pītar</td>
<td>-</td>
<td>=</td>
<td>pāter</td>
<td>pater</td>
</tr>
<tr>
<td>acc.</td>
<td>-ērm</td>
<td>pītāram</td>
<td>materī</td>
<td>dukterj</td>
<td>pateŗa</td>
<td>patrem</td>
</tr>
<tr>
<td>gen.</td>
<td>-r-os</td>
<td>pītūr</td>
<td>mater</td>
<td>dukterēs</td>
<td>patrōs</td>
<td>patris</td>
</tr>
<tr>
<td>dat.</td>
<td>-r-éi</td>
<td>pītṛe</td>
<td>materi</td>
<td>dukteriai</td>
<td>patri</td>
<td>patri</td>
</tr>
<tr>
<td>loc.</td>
<td>-ér-i</td>
<td>pītāri</td>
<td>materij</td>
<td>dukterij</td>
<td>patre</td>
<td></td>
</tr>
<tr>
<td>ins.</td>
<td>-r-ēh₁</td>
<td>pītṛā</td>
<td>materiją</td>
<td>dukterimi</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For Skt. -ur < *-rs see Section 13.2.7.

c. l-stems

The word for ‘apple’ may be reconstructed as follows:

<table>
<thead>
<tr>
<th></th>
<th>nom.</th>
<th>acc.</th>
<th>gen.</th>
<th>dat.</th>
<th>loc.</th>
<th>ins.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*h₂ēb-ōl</td>
<td>*h₂b-élém</td>
<td>*h₂b-l-ōs</td>
<td>*h₂bḥ-ḥyam</td>
<td>*h₂bśu</td>
<td>*h₂bḥhsǐ</td>
</tr>
</tbody>
</table>

The a- < *h₂e- was thus generalized.

The word for ‘salt’ shows a very archaic kind of ablaut (subtype 1):

<table>
<thead>
<tr>
<th></th>
<th>nom. sg.</th>
<th>acc.</th>
<th>gen.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*sēh₂-l</td>
<td>*sh₂-śél-m</td>
<td>*sh₂-l-ōs</td>
</tr>
<tr>
<td></td>
<td>Lith. sól-(y)mas ‘salt water’, Gr. (hál-s)</td>
<td>OCS sól-(u)</td>
<td>Hal-ōs</td>
</tr>
<tr>
<td></td>
<td>Lat. sól ‘salt’</td>
<td>hál-a</td>
<td>sal-īm</td>
</tr>
</tbody>
</table>

### d. m-stems

These also can only be reconstructed indirectly. As an example, we take the word *gʰhéi-ōm:
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 \(*\breve{g}h\breve{e}i\)- is still found in OCS \textit{zima}, Lith. \textit{žiemą} and Gr. \textit{kheimón} ‘winter’; other forms have generalized \(*\breve{g}h\breve{i}\)- (Av. \textit{ziiā} \textless \(*\breve{g}h\breve{i}\-\breve{o}[s]\).

The word for ‘earth’ also belongs here:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>(*\breve{g}h\breve{e}i-\breve{o}m)</td>
<td>ziiā</td>
<td>jiwn</td>
<td>khi--òn</td>
<td>hiems</td>
</tr>
<tr>
<td>acc.</td>
<td>(*\breve{g}h\breve{e}i-\breve{e}m-m)</td>
<td>qui--̀m- -àn</td>
<td>khi--òn- -a</td>
<td>hiem- -em</td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>(*\breve{g}h\breve{e}i-m--òs)</td>
<td>zimō</td>
<td>je-àn</td>
<td>khi--òn- -òs</td>
<td>hiem- -is</td>
</tr>
</tbody>
</table>

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 \*-\-òm\; 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’:

<table>
<thead>
<tr>
<th>PIE</th>
<th>Av.</th>
<th>Skt.</th>
<th>Lat.</th>
<th>Otr.</th>
<th>Lith.</th>
<th>(nepuotis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>(*\breve{n}èp--òt)</td>
<td>nàpāt</td>
<td>nepōs</td>
<td>Otr.</td>
<td>nie</td>
<td>Lith.</td>
</tr>
<tr>
<td>acc.</td>
<td>(*\breve{n}èp--òt-m)</td>
<td>nàpātam</td>
<td>nepōtem</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>(*\breve{n}èp-t-òs)</td>
<td>nàpāt</td>
<td>nepōtis</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Avestan has the original gen. \textit{naptō} \textless \textit{IIr.} \(-as\). The Lithuanian word became an i-stem (via the acc. \(-im < -*\-\-m\)). In Germanic OE \textit{nefō} ‘nephew’ (\textit{nephew} itself is a loan from French) became an n-stem. Perhaps the root must be reconstructed as \(*\breve{h}_2\breve{n}èp\)- because of Gr. \textit{anepsiós} \textless \(-pti\).

f. \(nt\)-stems

The suffix \(-uent\- ‘possessing, rich in’ was inflected as follows (Skt. \textit{revânt\-} ‘rich in treasures’, Gr. \textit{khari\-ent\-} ‘gracious’):

<table>
<thead>
<tr>
<th>PIE</th>
<th>Av.</th>
<th>Skt.</th>
<th>Lat.</th>
<th>Otr.</th>
<th>Lith.</th>
<th>(nepuotis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>(*\breve{u}ènt-s)</td>
<td>-vān</td>
<td>Av. -u-ā, -u-ās</td>
<td>Gr. -e-is</td>
<td></td>
<td></td>
</tr>
<tr>
<td>acc.</td>
<td>(*\breve{u}ènt-m)</td>
<td>-vānt-am</td>
<td>-u-u-ānt- --m</td>
<td>-ent-a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>(*\breve{u}ènt-òs)</td>
<td>-vāt-as</td>
<td>-u-u-u-at- --ō</td>
<td>-ent--os</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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. -uuā; in -uuas < *-yants, the -s is a recent addition. It is possible that the nominative was -unt, and that -yents only arose in the individual languages.

An isolated but well-known word is that for ‘tooth’:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*h₃d-ónt(s)</td>
<td>dán</td>
<td>dantis</td>
<td>odón</td>
<td>dēns</td>
<td>OS tand</td>
</tr>
<tr>
<td>acc.</td>
<td>*h₃d-ónt-m</td>
<td>dānt-am</td>
<td>dañtī</td>
<td>odōnt-a</td>
<td>dent-em</td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>*h₃d-nt-ós</td>
<td>dat-ās</td>
<td>dantiēs</td>
<td>odōnt-os</td>
<td>dent-is</td>
<td>Goth. tunþ-(u-)</td>
</tr>
</tbody>
</table>

The Lithuanian word became an i-stem through the accusative, while in Gothic it became a u-stem. The è of Latin is based on lengthening before -ns; Gr. od-oús is analogical. Lat. dent-, Goth. tunþ- < *dnt-. Originally the inflection must have been *h₃éd-nt, *h₃d-ént-m.

Exactly the same pattern is displayed by (the original participle) ‘willing, voluntary’:

<table>
<thead>
<tr>
<th></th>
<th>PIE</th>
<th>Skt.</th>
<th>Lith.</th>
<th>Gr.</th>
<th>Lat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*uék-ont(s)</td>
<td>uš-án</td>
<td></td>
<td>hek-ón</td>
<td></td>
</tr>
<tr>
<td>acc.</td>
<td>*uék-ont-m</td>
<td>uš-ánt-am</td>
<td></td>
<td>hek-ónt-a</td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>*uék-nt-ós</td>
<td>uš-at-ās</td>
<td></td>
<td>hek-ónt-os</td>
<td></td>
</tr>
</tbody>
</table>

The participles in -nt (cf. G. sing-end; see Section 18.9.1) had the following inflection:

<table>
<thead>
<tr>
<th></th>
<th>PIE</th>
<th>Skt.</th>
<th>Gr.</th>
<th>Gr. drak-</th>
<th>Lat.</th>
<th>Lat.</th>
<th>Goth. nasj-</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*'-nt(s)</td>
<td>-an</td>
<td>-ōn</td>
<td>-ēs</td>
<td>-ēns</td>
<td>i-ēns</td>
<td>-and-s</td>
</tr>
<tr>
<td>acc.</td>
<td>*'-ént-m</td>
<td>-ant-am</td>
<td>-ont-a</td>
<td>-ént-a</td>
<td>-ent-em</td>
<td>e-unt-em</td>
<td>-and</td>
</tr>
<tr>
<td>gen.</td>
<td>*'-nt-ós</td>
<td>-at-ās</td>
<td>-ont-os</td>
<td>-ént-os</td>
<td>-ent-is</td>
<td>e-unt-is</td>
<td>-and-is</td>
</tr>
</tbody>
</table>

Here, too, Greek introduced -ōn, but only with verbs that had the stress on the stem (in contrast to -ēns < *-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’:
Comparative Indo-European Linguistics

For \( *h_{1}su-men-\) see further on the adjectives (Section 14.3).

This inflection is also found in the comparative:

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>Gr.</th>
<th>Lat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>( *h_{1})-us-( -)s</td>
<td>as-( -)s</td>
<td>e( õ)s</td>
</tr>
<tr>
<td>acc.</td>
<td>( *h_{1})-us-( -)s-m</td>
<td>as-( -)s-am</td>
<td>( õ) &lt; ( *)e( õ)a</td>
</tr>
<tr>
<td>gen.</td>
<td>( *h_{1})-us-( -)s</td>
<td>as-( -)s</td>
<td>( õ)u( õ)s &lt; ( *)e( õ)os</td>
</tr>
</tbody>
</table>

The \( n (m) \) of Sanskrit is a later deviation. Sanskrit and Greek both, then, replaced -\( i\)-es- and -\( i\)-s- with -\( i\)-os-. The form -\( i\)-s- is found in Germanic, Goth. -\( i\)-an-. Slav. -\( j\)-š- is -\( i\)-s- with the \( i \) of -\( j\)-\( õ\)s (the \( s \) developed from a suffix -\( jo\)-). Lith. ger-\( ŕ\)-\( n\)-\( is \) displays the suffix in the form -\( i\)-es-.

The perfect participle also provides important information, for example ‘knowing’:

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>Gr.</th>
<th>Lat.</th>
<th>OCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>( *u)e( õ)d-( u)-( θ)s</td>
<td>vid -( v)-( ά)n</td>
<td>e( õ)d -( θ)s</td>
<td></td>
</tr>
<tr>
<td>acc.</td>
<td>( *u)id-( u)-( θ)-( m)</td>
<td>-( v)-( ŕ)-( ά)m</td>
<td>(-( õ)t-a)</td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>( *u)id-( u)-( θ)-( s)</td>
<td>-( ά)-( s)</td>
<td>(-( õ)t-( θ)s)</td>
<td></td>
</tr>
</tbody>
</table>

Here Sanskrit preserved the old ablaut in the genitive, etc. Greek exchanged \( *-o(h)-\)\( θ\)-\( s \) for -\( ot\)-\( os \); the variant \( *-u\)-\( s \) can still be found in fem. \( idu\)\( ά\)\( ί\)\( α\) < \( *u\)id-\( u\)-\( ι\)-\( θ\)\( s \), Skt. vidu\( ι\)ς.

Very old is the word for ‘nose’ (subtype 1):

<table>
<thead>
<tr>
<th>Skt.</th>
<th>Lat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>( *n)e( ŕ)-( θ)-( s)-( θ)</td>
</tr>
<tr>
<td>acc.</td>
<td>( *n)h( ŕ)-( ί)-( θ)-( m)</td>
</tr>
<tr>
<td>gen.</td>
<td>( *n)h( ŕ)-( ί)-( θ)-( s)</td>
</tr>
</tbody>
</table>

h. \( i\)-stems

By way of illustration we give: Skt. s\( ŕ\)h\( ά\) ‘ally’; Skt. á\( ά\)\( ί\)\( έ\), Gr. ó\( ί\) ‘sheep’; Gr. peith\( ō\) ‘persuasion’; Hitt. zahh\( ά\)i ‘battle’:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>( *-)( ο)-( ί)( -)( ί)( ί)</td>
<td>s( ŕ)h( ά)</td>
<td>á( ά)( ί)( έ)</td>
<td>peith( ō)</td>
</tr>
<tr>
<td>acc.</td>
<td>( *-)( ο)-( ί)-( m)</td>
<td>-( ί)-( έ)</td>
<td>-( ί)</td>
<td>-( ί)</td>
</tr>
<tr>
<td>gen.</td>
<td>( *-)( ί)-( ί)( -)</td>
<td>-( ί)-( ί)</td>
<td>-( ί)( ί)</td>
<td>-( ί)</td>
</tr>
</tbody>
</table>
Skt. ávim, Gr. óin are analogical after the PD inflection; -is is perhaps the oldest nominative (subtype 1).

i. u-stems
Av. uyra-bāzāuš ‘with strong arms’, xratuš ‘will-power’; Gr. hippeús ‘horseman’, pātrōs ‘uncle, father’s brother’; Hitt. harnau- ‘birthing chair’:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*-ē/ōus(s)</td>
<td>-bāz-āuš</td>
<td>xratuš</td>
<td>hipp-eús</td>
<td>pātr-ōs</td>
</tr>
<tr>
<td>acc.</td>
<td>*e/ou-m</td>
<td>(-um)</td>
<td>-ēa</td>
<td>-ōa</td>
<td>-aun</td>
</tr>
<tr>
<td>gen.</td>
<td>*u-os</td>
<td>-uus</td>
<td>xraθ-βō</td>
<td>-ēs</td>
<td>-ōs</td>
</tr>
</tbody>
</table>

The principle god of the Indo-European pantheon was ‘Zeus’:

<table>
<thead>
<tr>
<th>nom.</th>
<th>*Di-ēu-s</th>
<th>Skt. Dyaús</th>
<th>Gr. Zeús</th>
<th>Lat.(Iuppiter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>acc.</td>
<td>-ēm</td>
<td>Dyām</td>
<td>Zēn(a)</td>
<td>Iovem</td>
</tr>
<tr>
<td>gen.</td>
<td>-u-ōs</td>
<td>Divās</td>
<td>Diōs</td>
<td>Iovis</td>
</tr>
</tbody>
</table>

The divergent accusative *Diēm (one expects -eu-m) must have come out of -eum or -ēum (with e from the nominative).

j. Laryngeal Stems
h₁-stems. — These are known from Latin, and especially from the PIE word for ‘path’:

<table>
<thead>
<tr>
<th>nom.</th>
<th>*pont-eh₁-s</th>
<th>Skt. pānthās</th>
<th>Av. paŋtā</th>
<th>Lat. vātēs</th>
</tr>
</thead>
<tbody>
<tr>
<td>acc.</td>
<td>*pont-eh₁-m</td>
<td>pānthām</td>
<td>paŋtam</td>
<td>vātem</td>
</tr>
<tr>
<td>gen.</td>
<td>*pnt-h₁-ōs</td>
<td>pathās</td>
<td>paθō</td>
<td>vātis</td>
</tr>
<tr>
<td>ins.pl</td>
<td>*pnt-h₁-βi</td>
<td>pathibhis</td>
<td>padβiš</td>
<td>vātibus</td>
</tr>
</tbody>
</table>

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 ð from *tH, the alternation ā/i/ō < *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, māterīēs), 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).

<table>
<thead>
<tr>
<th></th>
<th>PIE</th>
<th>Skt.</th>
<th>OCS</th>
<th>Lith.</th>
<th>Gr.</th>
<th>Lat.</th>
<th>OI.</th>
<th>Goth.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SINGULAR</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nom.</td>
<td>-h₂</td>
<td>rasā</td>
<td>rosa</td>
<td>rasā</td>
<td>phorā</td>
<td>fuga</td>
<td>túath</td>
<td>gibā</td>
</tr>
<tr>
<td>voc.</td>
<td>-h₂e?</td>
<td>rase</td>
<td>roso</td>
<td>rāsa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>acc.</td>
<td>-eh₂m</td>
<td>rasām</td>
<td>rosq</td>
<td>rāsq</td>
<td>phorān</td>
<td>fugam</td>
<td>túaith</td>
<td>gibā</td>
</tr>
<tr>
<td>gen.</td>
<td>-h₂os</td>
<td>rasāyās</td>
<td>rosy</td>
<td>rasōs</td>
<td>phorās</td>
<td>fugae</td>
<td>túaithe</td>
<td>gibos</td>
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<tr>
<td>dat.</td>
<td>-h₂ei</td>
<td>rasāyai</td>
<td>rosé</td>
<td>rāsai</td>
<td>phorāi</td>
<td>fugae</td>
<td>túaith</td>
<td>gibai</td>
</tr>
<tr>
<td>loc.</td>
<td>-eh₂j</td>
<td>rasāyām</td>
<td>rosé</td>
<td>rasojē</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ins.</td>
<td>-h₂eh₂j</td>
<td>ras(ā)yā</td>
<td>rosojē</td>
<td>rasā</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PLURAL</strong></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nom.</td>
<td>-eh₂es</td>
<td>rasās</td>
<td>rosy</td>
<td>rāsos</td>
<td>phorāi</td>
<td>fugae</td>
<td>túatha</td>
<td>gibos</td>
</tr>
<tr>
<td>acc.</td>
<td>-eh₂ns</td>
<td>rasās</td>
<td>rosy</td>
<td>rāsas</td>
<td>phorās</td>
<td>fugās</td>
<td>túatha</td>
<td>gibos</td>
</tr>
<tr>
<td>gen.</td>
<td>-h₂om</td>
<td>rasānām</td>
<td>rosē</td>
<td>rāsū</td>
<td>phor(ā)ōn</td>
<td>fugārum</td>
<td>túath</td>
<td>gibo</td>
</tr>
<tr>
<td>dat.</td>
<td>-h₂mus</td>
<td>rasābhyas</td>
<td>rosamā</td>
<td>rasōms</td>
<td>fugīs</td>
<td>túathaib</td>
<td>gibom</td>
<td></td>
</tr>
<tr>
<td>loc.</td>
<td>-h₂su</td>
<td>rasāsū</td>
<td>rosaxē</td>
<td>rasonē</td>
<td>phoraīs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ins.</td>
<td>-h₂bhi</td>
<td>rasābhis</td>
<td>rosami</td>
<td>rasonis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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 < *-ih₂-os. Lat. -ae has adopted the -ii 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. -ōje contains the particle -en 'in'. The Sanskrit form is unclear. Greek has -ai in akhurmiāi ‘(through) the chaff’. — Instr. Skt. -ayā and OCS -ojo 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. -is < *-ais after the analogy of the o-stems.
Greek had the locative -āsi (for *-āsu), OAtt. tamíasí, Athénēsí ‘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’:

<table>
<thead>
<tr>
<th></th>
<th>*-iH</th>
<th>Skt. vṛkś</th>
<th>OCS ladii</th>
<th>Goth. bandi/wrakja</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*-iH</td>
<td>vṛkśi</td>
<td>ladīja</td>
<td>bandja</td>
</tr>
<tr>
<td>acc.</td>
<td>*-ieH-m</td>
<td>vṛkśam</td>
<td>ladīja</td>
<td>bandja</td>
</tr>
<tr>
<td>gen.</td>
<td>*-iH-os</td>
<td>vṛkśas</td>
<td>ladīja</td>
<td>bandjąos</td>
</tr>
</tbody>
</table>

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, *-jp < *-jām). Furthermore, Slavic and Germanic adopted -ja- in the genitive, etc. In Germanic -ih₂ was pronounced after short stems as [jh₂], which was first replaced by -jā and then became -ja: wrakja. The Skt. genitive vṛkśas is written as vṛkṣās (with -yā- as ‘independent svarita’) in the texts.

*uH*-stems. — The uH-stems are completely parallel with Skt. vṛkś:

<table>
<thead>
<tr>
<th></th>
<th>*-uH</th>
<th>Skt. tanūs ‘body’</th>
<th>OCS svekry ‘mother-in-law’</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*-uH</td>
<td>tanūsi</td>
<td>svekrỳ, -ovy</td>
</tr>
<tr>
<td>acc.</td>
<td>*-ueH-m</td>
<td>tanūsam</td>
<td>svekrỳve</td>
</tr>
<tr>
<td>gen.</td>
<td>*-uH-os</td>
<td>tanūsas</td>
<td>svekrỳve</td>
</tr>
</tbody>
</table>

**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. arén, gen. sg. arnós ‘lamb’ (stem *urh₁-n-)
b. Skt. ins.sg. bhiśā to bhīyāds- ‘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. lânte. The same word has the form ylai- in the compound ylai-ñäkte (Toch. A wlâ-ñkät) ‘Indra’, literally ‘king-god’.

a. Toch. B walo, lânte 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’):
### 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-h₁ is a static form; one would expect to see -eu-h₁ (for which see under d. n- stems).

### Plural

Nom. The Lithuanian form is analogical. Latin has the accusative ending. Gothic *-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.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ṣūn-</td>
<td>syn-</td>
<td>ṣūn-</td>
<td>ass-</td>
<td>pēkḥ-</td>
<td>port-</td>
<td>guth-</td>
<td>ṡun-</td>
</tr>
</tbody>
</table>

**PIE**

<table>
<thead>
<tr>
<th>sg. *-u</th>
<th>pl. *-eu-es</th>
<th>*-eu</th>
<th>*-eu-es</th>
<th>*-u-m</th>
<th>*-u-ns</th>
<th>*-ou-s</th>
<th>*-eu-om</th>
<th>*-eu-i</th>
<th>*-u-mus</th>
<th>*-ēu</th>
<th>*-u-su</th>
<th>*-u-h₁</th>
<th>*-u-h₁</th>
</tr>
</thead>
</table>

**SINGULAR**

<table>
<thead>
<tr>
<th></th>
<th>nom.</th>
<th>-ūs</th>
<th>-ō</th>
<th>sūnūs</th>
<th>-us</th>
<th>-us</th>
<th>-us</th>
<th>guth</th>
<th>-us</th>
</tr>
</thead>
<tbody>
<tr>
<td>voc.</td>
<td>-o</td>
<td>-u</td>
<td>sūnau</td>
<td>-us</td>
<td>-u</td>
<td>-us</td>
<td>guth</td>
<td>-u</td>
<td></td>
</tr>
<tr>
<td>acc.</td>
<td>-ūm</td>
<td>-ō</td>
<td>sūmū</td>
<td>-un</td>
<td>-un</td>
<td>-um</td>
<td>guth</td>
<td>-vē</td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>-ōs</td>
<td>-u</td>
<td>sūnūs</td>
<td>-āu</td>
<td>-ēs</td>
<td>-eō</td>
<td>gotho</td>
<td>-aus</td>
<td></td>
</tr>
<tr>
<td>dat.</td>
<td>-āve</td>
<td>-o</td>
<td>sūnu</td>
<td>-āu</td>
<td>-ē</td>
<td>-eō</td>
<td>guth</td>
<td>-vē</td>
<td></td>
</tr>
<tr>
<td>loc.</td>
<td>-āu</td>
<td>-u</td>
<td>sūmu</td>
<td>-āu</td>
<td>-ē</td>
<td>-eō</td>
<td>guth</td>
<td>-vē</td>
<td></td>
</tr>
<tr>
<td>ins.</td>
<td>-unā</td>
<td>-ōti</td>
<td>sūnum</td>
<td>-āu</td>
<td>-ē</td>
<td>-iwe</td>
<td>guth</td>
<td>-vē</td>
<td></td>
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</tbody>
</table>

**PLURAL**

<table>
<thead>
<tr>
<th></th>
<th>nom.</th>
<th>-āvas</th>
<th>-ove</th>
<th>sūnūs</th>
<th>-āu</th>
<th>-eō</th>
<th>-eō</th>
<th>gothae</th>
<th>-jus</th>
</tr>
</thead>
<tbody>
<tr>
<td>acc.</td>
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<td>-y</td>
<td>sūnum</td>
<td>-amus</td>
<td>-eas</td>
<td>-ēs</td>
<td>guthu</td>
<td>-uns</td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>-ānām</td>
<td>-ovy</td>
<td>sūnū</td>
<td>-āu</td>
<td>-eōn</td>
<td>-eōn</td>
<td>gothae</td>
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<td></td>
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<tr>
<td>dat.</td>
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<td>-ōti</td>
<td>sūnum</td>
<td>-āu</td>
<td>-eōn</td>
<td>-eōn</td>
<td>gothaib</td>
<td>-um</td>
<td></td>
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<tr>
<td>loc.</td>
<td>-āsu</td>
<td>-ōvā</td>
<td>sūnumos</td>
<td>-ē</td>
<td>-iwe</td>
<td>-iwe</td>
<td>guth</td>
<td>-vē</td>
<td></td>
</tr>
<tr>
<td>ins.</td>
<td>-ābhīs</td>
<td>-ōmi</td>
<td>sūnumis</td>
<td>-ē</td>
<td>-iwe</td>
<td>-iwe</td>
<td>guth</td>
<td>-vē</td>
<td></td>
</tr>
</tbody>
</table>
b. Laryngeal Stems

*h₂-stems. — There is only one word known with the suffix -eh₂ that has the PD inflection, namely the word for 'wife':

<table>
<thead>
<tr>
<th></th>
<th>PIE</th>
<th>Skt.</th>
<th>OIr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*gʷen-h₂</td>
<td>jánis (gnâ)</td>
<td>ben</td>
</tr>
<tr>
<td>gen.</td>
<td>*gʷn-eh₂-s</td>
<td>gnás (jányur)</td>
<td>mná</td>
</tr>
</tbody>
</table>

Here the Old Irish inflection is the oldest. In Indo-Iranian the nom. jānī(-) became an i-stem, and the gen. gnás became an ā-stem. The word survives in many languages: OCS žena, OPr. genno, Arm. kin, Toch. A šām, Toch. B šana, Gr. gunē (Boet. baná; guné has a deviant genitive, gunaikós, probably in origin an adjective ['of a woman']), Goth. qino; Goth. gëns, E. queen go back to *gʷēn-.

ih₂-stems. An important category are the PD ih₂-stems. The feminine of the adjectives is formed on this basis, e.g. with the -nt- participles (Skt. 'goddess', Lith. 'bride', Gr. 'table'):

<table>
<thead>
<tr>
<th></th>
<th>PIE</th>
<th>Skt.</th>
<th>Lith. marti</th>
<th>Gr. trúpeza</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*-ih₂</td>
<td>dev-i</td>
<td>marčia</td>
<td>trúpezan</td>
</tr>
<tr>
<td>acc.</td>
<td>*-ih₂-m</td>
<td>-i̯m</td>
<td>márcia</td>
<td>trúpezan</td>
</tr>
<tr>
<td>gen.</td>
<td>*-ieh₂-s</td>
<td>-yās</td>
<td>marčiōs</td>
<td>trapēzēs</td>
</tr>
</tbody>
</table>

Acc. The Lithuanian form is analogical.

For the participles, compare:

Skt. bháránti, OCS nesōžti, Gr. phérousa fem. 'carrying'
OCS -ošt- < -onti-; Gr. -ousa < -ontia < *-ontih₂.

c. s-stems

The neuter s-stems took the PD inflection (*nebh- 'cloud, heavens', *génh₁- 'lineage, clan'; OIr. 'house'; Goth. 'darkness'):

<table>
<thead>
<tr>
<th></th>
<th>PIE</th>
<th>Skt.</th>
<th>OCS</th>
<th>Hitt.</th>
<th>Gr.</th>
<th>Lat.</th>
<th>OIr.</th>
<th>Goth.</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*-os</td>
<td>-as</td>
<td>-o</td>
<td>-is</td>
<td>-os</td>
<td>-us</td>
<td>tech</td>
<td>-is</td>
</tr>
<tr>
<td>gen.</td>
<td>*-és-ös</td>
<td>-as-as</td>
<td>-es-e</td>
<td>-is-as</td>
<td>-e-os</td>
<td>-er-is</td>
<td>tige</td>
<td>-iz-is</td>
</tr>
</tbody>
</table>

<table>
<thead>
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<th>PIE</th>
<th>Skt.</th>
<th>OCS</th>
<th>Hitt.</th>
<th>Gr.</th>
<th>Lat.</th>
<th>OIr.</th>
<th>Goth.</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*-és-h₂</td>
<td>-ārnsi</td>
<td>-es-a</td>
<td>-e-a</td>
<td>-er-a</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>*-és-öm</td>
<td>-as-ām</td>
<td>-es-ô</td>
<td>-is-an</td>
<td>-ē-ōn</td>
<td>-er-um</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Singular. Nom. In Hittite and Gothic *-os was replaced by *-es.
Plural. Several languages point to *-es-h₂. The ending *-h₂ is identified with the nom. sg. ending of the ā-stems. Furthermore, Av. -ā < *-ās, Skt. -āṁśi (with secondary -m- and -i < -h₂) 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 *-ōs- this type must have been PD. Probably the original inflection was *nétb⁶-s, gen. *n(e)b⁶-ōs-s (thus precisely as *-u, *-ēu-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- (*h₃nh₃-mn- ‘name’; OAv. haxman- ‘community’, cašman- ‘eye’, ašman- ‘verse’); OAv. sāx’an- ‘teaching’ has *-uen-, Gothic háirtō ‘heart’ < *-en-:

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>OAv.</th>
<th>OCS</th>
<th>Gr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGULAR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nom.</td>
<td>-mē</td>
<td>nāma</td>
<td>haxmāa</td>
<td>imē</td>
</tr>
<tr>
<td>gen.</td>
<td>-men-s</td>
<td>nām̄nas</td>
<td>haxmōṅg</td>
<td>imen-e</td>
</tr>
<tr>
<td>dat.</td>
<td>-men-ei</td>
<td>nāmme</td>
<td>haxmaini</td>
<td>imen-i</td>
</tr>
<tr>
<td>loc.</td>
<td>-mēn</td>
<td>nāmani</td>
<td>cašmān</td>
<td>imen-e</td>
</tr>
<tr>
<td>ins.</td>
<td>-men-h₁</td>
<td>nāmnā</td>
<td>cašmaini</td>
<td>imen- postpon.</td>
</tr>
<tr>
<td>PLURAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nom.</td>
<td>-mōn</td>
<td>nāmānī</td>
<td>haxmām; ašmānī</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-men-h₂</td>
<td>(nāmānâ , -a)</td>
<td>sāxvēnī</td>
<td>imen-a</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lat.</th>
<th>Goth.</th>
<th>OIr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGULAR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nōmen</td>
<td>haírto</td>
<td>ainm</td>
</tr>
<tr>
<td>nōmin-is</td>
<td>haírtins</td>
<td>anm(a)e</td>
</tr>
<tr>
<td>nōmin-i</td>
<td>haírtin</td>
<td>anm(a)im(m),</td>
</tr>
<tr>
<td>nōmine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLURAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>haírtona</td>
</tr>
<tr>
<td>nōmina</td>
<td>anman(n)</td>
<td></td>
</tr>
</tbody>
</table>
Singular. Nom.-acc. Goth. -o is analogical, after the plural. — Gen. Only Avestan and Old Irish reflect the original PD ending *-én-s (> Plur. *-anh > OAv. -øng, YaV. -qn). — Loc. Only Avestan has the original ending *-mën (-n was assimilated to the preceding -m-). — Instr. Avestan is again unique; it preserves the expected PD form *-én-h₁ (-anh- 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 *-ôn (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’):

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>OAv.</th>
<th>Hitt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*iékʷ-r</td>
<td>yāk-ṛ-t</td>
<td>áh-ar</td>
</tr>
<tr>
<td>gen.</td>
<td>*i(e)kʷ-én-s</td>
<td>yak-n-ās</td>
<td>áh-n-as</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>nom.</td>
<td></td>
<td>hēp-ar</td>
<td>iec-ur</td>
</tr>
<tr>
<td>gen.</td>
<td></td>
<td>hēp-at-os</td>
<td>iec-in-oris</td>
</tr>
</tbody>
</table>

Nom. Skt. -ar, OAv. -ār < *-r. 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, -āng < *-ēns. 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: *sēh₂-ul, gen. sh₂-űén-s ‘sun’, in Skt. svār (= sūar), Av. hūuarā, gen. xṭāng, 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. jānis ‘wife’ gnā ‘lady, goddess’
acc.sg. jānim gnám
gen.sg. jānyus gnáš

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.
Chapter 13. The Substantive

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. ēan 'spring;' Lith. vāsara 'summer,' OCS vesna 'spring;' Av. vaŋrī (< Ilr. *waŋti-) 'in spring,' Skt. vasantā- '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:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Skt. krātvah [gen.sg.] 'magical force'</td>
<td>krat-u-</td>
</tr>
<tr>
<td>b.</td>
<td>Gr. grāós (&lt; *grawos) [gen.sg.f.] 'old woman'</td>
<td>*grauH-u-</td>
</tr>
<tr>
<td>c.</td>
<td>Skt. pātye [dat.sg.m.] 'husband'</td>
<td>pat-i</td>
</tr>
<tr>
<td>d.</td>
<td>Gr. Diós [gen.sg.m.] 'Zeus'</td>
<td>*di-u-</td>
</tr>
<tr>
<td>e.</td>
<td>Skt. gāve [dat.sg.f.] 'cow'</td>
<td>*gʷh₂-u-</td>
</tr>
<tr>
<td>f.</td>
<td>Gr. pekheos (&lt; *pakhewos) [gen.sg.] 'arm'</td>
<td>*bʰh₂gʰ-u-</td>
</tr>
<tr>
<td>g.</td>
<td>Skt. áyvah [gen.sg.f.] 'sheep'</td>
<td>av-i</td>
</tr>
<tr>
<td>h.</td>
<td>Skt. dyám [acc.sg.m.] 'god'</td>
<td>*di-u-</td>
</tr>
</tbody>
</table>

Exercise 38
Determine for the following forms whether they point to HD or PD inflection. All go back to PIE u-stems.

<p>| | | |</p>
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<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Av. yābbha [ins. sg. m.] (&lt; *yātwā)</td>
<td>Av. yātu- 'sorcery'</td>
</tr>
<tr>
<td>b.</td>
<td>Goth. faihaus [gen. sg. n.]</td>
<td>Goth. faihu 'money'</td>
</tr>
<tr>
<td>c.</td>
<td>Av. nasāum [acc. sg. f.] (&lt; *nasōwam)</td>
<td>Av. nasu- 'corpse'</td>
</tr>
<tr>
<td>d.</td>
<td>Lat. senātus [gen. sg.] (&lt; *-tou-s)</td>
<td>Lat. senātus 'senate'</td>
</tr>
<tr>
<td>e.</td>
<td>Av. -fseauue (in compounds) [dat. sg. m.] (&lt; *-fśauai)</td>
<td>Av. pasu- 'cattle'</td>
</tr>
<tr>
<td>f.</td>
<td>Hitt. harnuyas [gen.sg.]</td>
<td>Hitt. harnu- 'birthing chair'</td>
</tr>
</tbody>
</table>

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 (dādat- < *dé-dh₂-nt- 'giving'), the s-aorist (dhāk-š-at- 'burning') and the static present (sās-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:
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):

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>Av.</th>
<th>Olc.</th>
<th>OE</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*mēh₂-tr</td>
<td>(māṭā)</td>
<td></td>
<td>(fāer)</td>
</tr>
<tr>
<td>gen.</td>
<td>*mēh₂-tr-s</td>
<td>māṭur</td>
<td></td>
<td></td>
</tr>
<tr>
<td>acc. pl.</td>
<td>*mēh₂-tr-ns</td>
<td>mātarqś</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The genitive has -tr-s. This form must be old, because a secondary origin is unthinkable. The acc. pl. Av. -tṛqś [-tṛś] /-trns/ goes back to -tr-ns. The accent (cf. Gr. mētér; in Sanskrit it has shifted on the model of ‘father’) and the full grade of the root (as against the zero grade of ‘father’, *ph₂-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. nekūz < *negw(h)-t-s ‘at night’ have e-grade whereas the other languages (Lat. nox, noctis, Goth. nāhts, Gr. nūks) require an o-grade *nogw(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. gōnu) and e-grade (Lat. genu). This suggests the following inflection:

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>Av.</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom. sg.</td>
<td>*gōn-u</td>
<td></td>
</tr>
<tr>
<td>gen. sg.</td>
<td>*gēn-u-s</td>
<td></td>
</tr>
</tbody>
</table>

The PD inflection has *-ulh₁ in the instrumental case. This form is probably taken over from the static inflection, because both suffix and ending have the zero grade -u-h₁.

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:
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-ɑ) and ē, e (Lat. pēs, pedis). Here the static inflection is obvious:

<table>
<thead>
<tr>
<th>Case</th>
<th>Static</th>
<th>Hysterodynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom. masc.</td>
<td>pód(s)</td>
<td>uókʰ-s</td>
</tr>
<tr>
<td>acc.</td>
<td>péd-m</td>
<td>uókʰ-m</td>
</tr>
<tr>
<td>gen.</td>
<td>péd-s</td>
<td>uókʰ-s</td>
</tr>
</tbody>
</table>

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-i.

Neuters. The word for ‘house’ had ō (Gr. dô, dôma, 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. dāṅg paitiś).

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. bhrús, OCS brōvba, Gr. ophrūs. Probably the word for ‘foal’ was also an HD word, Gr. pólos, Goth. fula (n-stem; E. foal), OIc. fyl < *fulia, PGm. *ful- < *pʰH-:

<table>
<thead>
<tr>
<th>Case</th>
<th>Static</th>
<th>Hysterodynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom. PIE</td>
<td>*h₃bhʳēuH-s</td>
<td>*pʰlH-s</td>
</tr>
<tr>
<td>acc.</td>
<td>*h₃bhʳēuH-m</td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>*h₃bh₃ruH-ós</td>
<td>*pʰlH-ós</td>
</tr>
</tbody>
</table>

In this way we may also explain Gr. p(t)ólis ‘city’, Skt. pår, pár-am, Lith. pilis, forms which point to PIE *t pólH-/*tʰlH-. Of the same type seems to have been Hittite kásza /kāst-s/ ‘hunger’ < *gʰósɑ-, since the derivatives kist-ant- ‘hunger’, kist-u̯nant- ‘hungry’ point to *kst- < *gʰnds-.

In the same manner the inflection of the word for ‘one’ must be explained:
The root *sem-* we also find, for example, in Latin *sem-el* 'once', *simplex* 'simple'; OCS *samᾱ* 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:

\*bʰi- bó <bhr
\*kʷé-kw
\*kʷ- kʷél-m
\*bʰi- bó-ós <bhr-bós
\*kʷ- kʷél-ós

The accusative of ‘wheel’ is perhaps found in OPr. *kelan*, OIc. *hvel*, with *kʷel-o* - based on *kʷel-* (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. *vēs* ‘power’, PIE *uiH*; *muH-s* ‘mouse’.

**Neuters.** A clear case seems to be *kērd* ‘heart’, gen. *kērd-ós*. One does not expect to see HD inflection for neuter words. It is possible that the old stem of the oblique cases was *kred-* as in Skt. *śrad-dhā* ‘trust’. In that case, the word would not be a root noun but a d-stem: *kēr-d,* *kēr-ed-s.*

**Exercise 39**
Reconstruct the PIE preform of the given case-forms:

a. Myc. *a-ma-si* /harmasi/ dat.pl. ‘with wheels’ (stem *h₂-mn-, PD)
b. Lat. *sopōri* dat.sg. ‘sleep’ (*suep-s-, HD*)
c. OCS *slovesᾱ* gen.pl. ‘words’ (*kleu-s-, PD*)
d. Skt. *sākhīn* acc.pl. ‘friends’ (*sokwH-i-, HD*)
e. Skt. *rathīas* (= *rathyās*) gen.sg. ‘charioteer’ (*Hrōth₂-iH-, HD*)
g. Hitt. *eshar* nom.sg., *ishanas* gen.sg. ‘blood’ (*h₁esh₂-tr-n-*)
h. OE *brōþor* gen.sg. ‘brother’ (*bʰre₁h₂-tr-, S*)
Exercise 40
Reconstruct the PIE stem of the following words. To which category of stems do they belong?

b. Skt. *spāś-* m. ‘spy’
c. Skt. *(dharma-*)vid-*knowing (the law)*
d. Gr. nom.sg. *klōps*, 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 (*ueh₂-t-h₁-, HD)’
b. ‘In winter (*gʰei-m-) (it is) food (*h₁ed-mn-, PD) for the dogs (*kú-n-, HD)’
c. ‘With trees (*dor-u-, PD) of acorns (*gⁿelh₂-n-, HD)’
d. ‘(She hits) the thief (*bʰor-, S) with metal (*h₂ei-s-, PD)’
e. ‘A lover (*keh₂-us-, HD) of liver (*iekʷ-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 (*ulkʷ- ‘wolf’, Hitt. ‘sea’; ntr. ‘yoke’):
### Masculine/Feminine

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</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*-ôs</td>
<td>-as</td>
<td>-ô</td>
<td>vilkas</td>
<td>-as</td>
<td>-os</td>
<td>-us</td>
<td>-s</td>
</tr>
<tr>
<td>voc.</td>
<td>*-e</td>
<td>-a</td>
<td>-(ê)e</td>
<td>vilke</td>
<td>-e</td>
<td>-e</td>
<td>-ô</td>
<td>Ø</td>
</tr>
<tr>
<td>acc.</td>
<td>*-om</td>
<td>-am</td>
<td>-ô</td>
<td>vilkā</td>
<td>-an</td>
<td>-on</td>
<td>-um</td>
<td>-ô</td>
</tr>
<tr>
<td>gen.</td>
<td>*-os</td>
<td>-asya</td>
<td>-as</td>
<td>vilkā</td>
<td>-oio</td>
<td>-ī</td>
<td>-is</td>
<td></td>
</tr>
<tr>
<td>abl.</td>
<td>*-ôd</td>
<td>-âd</td>
<td>-a</td>
<td>vilko</td>
<td>-az</td>
<td>-ô(d)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dat.</td>
<td>*-ôi</td>
<td>-âya</td>
<td>-u</td>
<td>vilkui</td>
<td>-î</td>
<td>-ôi</td>
<td>-ô</td>
<td></td>
</tr>
<tr>
<td>loc.</td>
<td>*-oi</td>
<td>-e</td>
<td>-(ê)e</td>
<td>vilke</td>
<td>-î</td>
<td>-ôi</td>
<td>-î</td>
<td></td>
</tr>
<tr>
<td>ins.</td>
<td>*-oh₁</td>
<td>-êna</td>
<td>-om tô</td>
<td>vilkû</td>
<td>-it</td>
<td></td>
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</table>

### PLURAL

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>nom.</td>
<td>*-ôs</td>
<td>-âs</td>
<td>-(c)i</td>
<td>vilkai</td>
<td>-es</td>
<td>-oi</td>
<td>-î</td>
<td>-os</td>
</tr>
<tr>
<td>acc.</td>
<td>*-ons</td>
<td>-ân</td>
<td>-y</td>
<td>vilkâs</td>
<td>-us</td>
<td>-ous</td>
<td>-ôs</td>
<td>-ans</td>
</tr>
<tr>
<td>gen.</td>
<td>*-om</td>
<td>-ânâm</td>
<td>-ô</td>
<td>vilkû</td>
<td>-an</td>
<td>-ôn</td>
<td>-ôrum</td>
<td>-e</td>
</tr>
<tr>
<td>dat.</td>
<td>*-omus</td>
<td>-ebhyâs</td>
<td>-om tô</td>
<td>vilkâms</td>
<td>-as</td>
<td></td>
<td>-am</td>
<td></td>
</tr>
<tr>
<td>loc.</td>
<td>*-oisu</td>
<td>-ešu</td>
<td>-(c)êxô</td>
<td>vilkuôsa</td>
<td>-as</td>
<td>-oisi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ins.</td>
<td>*-ôis</td>
<td>-ais</td>
<td>-y</td>
<td>vilkais</td>
<td>-it</td>
<td>-ois</td>
<td>-îs</td>
<td></td>
</tr>
</tbody>
</table>

### Neuter

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>nom./acc.</td>
<td>*-om</td>
<td>-âm</td>
<td>-ô</td>
<td>-an</td>
<td>-ôn</td>
<td>-um</td>
<td>Ø</td>
</tr>
</tbody>
</table>

### Singular

- **Nom.** see acc. — Acc. Balto-Slavic *-om* became *-um*. Baltic replaced *-û* with *-q*; in Slavic *-um* became *-ô*. On this basis the nominative -os was replaced by *-us > -ô*. — Gen. Balto-Slavic has *-âd*, which replaces abl. sg. *-ôd*. The Germanic ending *-eso* comes from the pronouns. Italo-Celt. *-i* < *-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-i’. 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 Botorrta) has a locative in *-ei, which we also find in Osca. It may come from the pronouns. — Instr. Lith. vilkt (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. -ārhō, 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:

<table>
<thead>
<tr>
<th></th>
<th>nom. sg.</th>
<th>pl.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*-os</td>
<td>*-ōs &lt; -oh₁es &lt; -o-es</td>
</tr>
<tr>
<td>acc.</td>
<td>*-om</td>
<td>*-ons &lt; -o-ns</td>
</tr>
<tr>
<td>gen.</td>
<td>*-os</td>
<td>*-om</td>
</tr>
<tr>
<td>abl.</td>
<td>*-ōd &lt; -oh₁ed &lt; -o-ed</td>
<td>*-o-ios?</td>
</tr>
<tr>
<td>dat.</td>
<td>*-ōi &lt; -oh₁ei &lt; -o-ei</td>
<td>*-o-mus</td>
</tr>
<tr>
<td>loc.</td>
<td>*-oi &lt; -o-i</td>
<td>*-ois</td>
</tr>
<tr>
<td>ins.</td>
<td>*-oh₁ &lt; -o-h₁</td>
<td>*-ōis &lt; -oh₁eis &lt; -o-eis?</td>
</tr>
</tbody>
</table>

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. *ǵombʰos
b. *urǵoi
c. *supnoisu
d. *porkons
e. *uogʰnelom
f. *uiHrōd
g. *h₁rudʰrōis
h. *peh₂tloh₁

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-tlo-)’
b. ‘On the wagon (*uogʰro-) of dreams (*suepno-)’
c. ‘(They are) white (*kuitno-) bears (*h₂rtko-)’
d. ‘(They lure) the wolf (*ulkʷo-) with pigs (*porko-)’

13.2.10 The historical relation between the inflectional types

The nominative type CéC-ōR of the HD inflection (*népōt) 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-h₂ > 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-éR, for example *ph₂tér.

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:
<table>
<thead>
<tr>
<th>proterodynamic</th>
<th>hysterodynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td>CéC-R *médʰ-u</td>
<td>CéC-R *dʰégʰ-m</td>
</tr>
</tbody>
</table>

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; sumanás : 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:

<table>
<thead>
<tr>
<th></th>
<th>nominative system</th>
<th>ergative system</th>
</tr>
</thead>
<tbody>
<tr>
<td>transitive verb:</td>
<td>subject</td>
<td>nominative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ergative</td>
</tr>
<tr>
<td></td>
<td>object</td>
<td>accusative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>absolutive</td>
</tr>
<tr>
<td>intransitive verb:</td>
<td>subject</td>
<td>nominative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>absolutive</td>
</tr>
</tbody>
</table>

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. *mēl₂-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

<table>
<thead>
<tr>
<th></th>
<th>PIE</th>
<th>Skt.</th>
<th>Av.</th>
<th>OCS</th>
<th>Lith.</th>
<th>Gr.</th>
<th>OIr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom. masc./fem.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-st.</td>
<td>*-h₁e</td>
<td>-ā(u)</td>
<td>-a</td>
<td>-i</td>
<td>-e</td>
<td>-e</td>
<td>*-e</td>
</tr>
<tr>
<td>u-st.</td>
<td>*-h₁</td>
<td>-ū</td>
<td>-u</td>
<td>-y</td>
<td>-ū</td>
<td>-ei</td>
<td>*-ū</td>
</tr>
<tr>
<td>o-st.</td>
<td>*-h₁</td>
<td>-ā(u)</td>
<td>-a, -ā</td>
<td>-a</td>
<td>-ū</td>
<td>-ō</td>
<td></td>
</tr>
<tr>
<td>eh₁-st</td>
<td>*-ih₁</td>
<td>-e</td>
<td>-e</td>
<td>-ē</td>
<td>-i</td>
<td>(-ā)</td>
<td>*-ai</td>
</tr>
<tr>
<td>nom. ntr.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C-st.</td>
<td>*-ih₁</td>
<td>-i</td>
<td>-i</td>
<td>-ē</td>
<td>-e</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o-st.</td>
<td>*-ih₁</td>
<td>-e</td>
<td>-e</td>
<td>-ē</td>
<td>-ē</td>
<td>(-ō)</td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>*-h₁e</td>
<td>loc.</td>
<td>loc.</td>
<td>loc.</td>
<td>loc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>loc.</td>
<td>*-h₁ou</td>
<td>-os</td>
<td>-uuō</td>
<td>-u</td>
<td>-aū</td>
<td>-oīn</td>
<td></td>
</tr>
<tr>
<td>dat.</td>
<td>*-me</td>
<td>bhyām</td>
<td>biiₐ</td>
<td>ma</td>
<td>m</td>
<td>oīn</td>
<td></td>
</tr>
<tr>
<td>ins.</td>
<td>*-bʰih₁?</td>
<td>= dat.</td>
<td>-m</td>
<td>-m</td>
<td>-m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>abl.</td>
<td>always/everywhere</td>
<td>dat.</td>
<td>-m</td>
<td>-m</td>
<td>-m</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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. pitār-ā/-au, Av. gauu-ā ‘cows’, Lith. pf. ptc. áugus-e, Gr. patēr-e, OIr. athir.

u-stems: Skt. sānu, Av. mainiu ‘spirits’, OCS syny, Lith. sūnu, OIr. guth ‘voices’.

o-stems: Skt. vṛkā/-au, OCS boga ‘gods’, Lith. vilkū, Gr. hippō ‘horses’.


Nom. neuter:

C-stems: Skt. nāmañi, OCS imenē ‘names’, Gr. gēnei < *-es-e.

o-stems: Skt. yugē, OCS izē, Gr. zugó ‘yokes’.

Gen. Av. nara ‘men’.

Dat. Skt. sānūbhāyāṃ, Av. nārbiia, OCS synōma, Lith. sūnūm, instr. -um.

Loc. Skt. jānasos, Av. anhuuō ‘life’, OCS slesaiu ‘words’, Lith. dviejau ‘in two’;

-o-stems: *-oi-h,ou (?): Skt. āsvayos, Av. zastaiiō ‘hands’, Gr. hippoīn.

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 *-eh₁-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 h₁.

Nom. neuter. Indo-Iranian points to -i < *-ih₁. The Greek form will be that of the masc.-fem. If Gr. ósse ‘eyes’ reflects *okʷ-e < *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, -ā < *-ās. This was preceded by a laryngeal, considering OAv. mainiuudā = /manyuHāh/ ‘spirits’. Thus *-h₁,ē/ōs, or rather *-h₁e/oHs, for a long vowel is improbable.

Loc. OCS -u and Lith. -au 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. pitrō often counts as a trisyllabic word, it was perhaps *pitrHos (although this would regularly have given *pitiros), so the ending was *-Hou+ı. Other possibilities beside *-h₁ou are *-h₁/ε/ou (*-oHu is ruled out because the Lithuanian ending is circumflex). The o-stems have *-oi- preceding the ending. Gr. -oīn is unclear (-oi-Hu?).

Dat.-abl.-instr. IIr. *-bhya 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:

<table>
<thead>
<tr>
<th>-k</th>
<th>-t</th>
<th>-nt</th>
<th>-s</th>
<th>-h₂</th>
<th>-r</th>
<th>-l</th>
<th>-m</th>
<th>-n</th>
<th>-i</th>
<th>-u</th>
<th>-o</th>
</tr>
</thead>
<tbody>
<tr>
<td>(+)</td>
<td>(+)</td>
<td>+</td>
<td>(+)</td>
<td>(+)</td>
<td>−</td>
<td>−</td>
<td>−</td>
<td>(+)</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

(+ 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 *-h₂ is found in *meg̣-h₂- '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-k-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-aps (E. naked), Skt. nag-ná, Gr. γυμνός, Lith. núog-ūs, Hitt. nekumanza, so that these suffixes must have been added in the individual languages to the root without suffix; the root is *nogʷ-/*negʷ- (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. khari-ent- 'rich in graciousness'; PIE *-uent-.
Skt gurú-, Gr. barús, Goth. kaurus, Lat. gravis (from *graus) ‘heavy’ < PIE *gʷr(e)h₂-u-.
Skt. vādhri- ‘castrated’, Gr. éthri- < PIE *uedhrī-.
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 O*), 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 protodynamic 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:

<table>
<thead>
<tr>
<th>masc.</th>
<th>ntr.</th>
<th>fem.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-s</td>
<td>-s</td>
<td>'new'</td>
</tr>
<tr>
<td>-eC, -oC</td>
<td>-C</td>
<td>'sweet'; Skt. <em>mādhus, mādhu</em></td>
</tr>
<tr>
<td>-ēC, -ōC</td>
<td>-C; -eC, -oC</td>
<td>'thin'; Skt. <em>tanūs, tanū, tanū</em></td>
</tr>
<tr>
<td><em>suḥ₂d-u-s</em></td>
<td><em>suḥ₂d-u</em></td>
<td><em>suḥ₂d-u-ih₂</em>; Skt. <em>svādūs, svādvī</em>; Gr. <em>hēdūs, -ú, -eía</em></td>
</tr>
<tr>
<td><em>-uṇt-</em></td>
<td><em>-uṇt-</em></td>
<td>Skt. <em>āmavant-</em>, -vāt, -vatī*</td>
</tr>
<tr>
<td><em>mēgh₂(-s)</em></td>
<td><em>mēgh₂</em></td>
<td>'big'; Gr. <em>mēgas, méga</em>; Skt. ntr. <em>māhi</em></td>
</tr>
<tr>
<td><em>-men-ēś</em></td>
<td><em>-men-ēś</em></td>
<td>'well-minded'; Skt. <em>sumānās, -as</em>; Gr. <em>eumenēs, -ēs</em></td>
</tr>
<tr>
<td><em>uēt-us</em></td>
<td><em>uēt-us</em></td>
<td>'old'; Lat. <em>vetus</em></td>
</tr>
<tr>
<td><em>peiH-uōn</em></td>
<td><em>peiH-ur</em></td>
<td><em>peiH-ur-ih₂</em>; Skt. m. <em>pīvan-</em>, f. <em>pīvari-</em>, Gr. m. <em>pión, f. píeira</em></td>
</tr>
</tbody>
</table>
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. *uróś*). There are also, however, HD u-stems, such as Skt. *mádhus* ‘sweet’, gen. *mádhvas*. Unique is the laryngeal stem *meg-*$h_2$-‘great’:

<table>
<thead>
<tr>
<th>Case</th>
<th>Form</th>
<th>Meaning</th>
<th>Greek Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom. sg.</td>
<td><em>meg-</em>$h_2$-s</td>
<td>Gr. <em>mégas</em></td>
<td></td>
</tr>
<tr>
<td>acc. sg.</td>
<td><em>meg-</em>$h_2$-$m$</td>
<td>Gr. adv. <em>ágán</em> ‘too much’</td>
<td></td>
</tr>
<tr>
<td>gen. sg.</td>
<td><em>meg-</em>$h_2$-$ós*</td>
<td>Skt. <em>mahás</em> (with full grade from the nom.)</td>
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The inflection of *many* is not completely clear: Gr. *polús* < *polh*$u$-, Goth. *fílu* < *pelh*$u$- (G. *viel*), Skt. *purú* < *plh*$u$-, 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*$h_2$-*$k*$-$m$ (in Gr. *malakós*), gen. *mlh*$h_2$-*$k*$-$ós$ (Gr. *bláks*, *blákós*), ‘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*$s*$u*$-$men*$-es* ‘favorably disposed’ to *men*$-ós$; cf. above):

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<tr>
<th>Case</th>
<th>Form</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>nom. sg. m.</td>
<td><em>h</em>$s*$u*$-$men*$-$ēs*</td>
<td>ntr. -men*$-$es</td>
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<tr>
<td>acc. sg.</td>
<td>-es*$-m$</td>
<td>-es</td>
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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*- (*-istHọ*?). The latter contained the zero grade of *-ies* + *-t(H)ọ*-, 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:
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Skt. vás-u- ‘good’ : vás-yas-, vás-iṣṭha-
Gr. oligos ‘little’ : oleízo(h)- < *h₂leig-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, *-iēs-m, *-i-s-ōs. 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. alpeis ‘old’: alpiza < *-is-ōn
OS lang ‘long’: lengiro
E. long: longer

In Greek these forms were generalized: hēdion ‘sweeter’, acc. hēdiona, older hēdīo < *-ios-α.

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. orérteros ‘(living) in the mountains’, and not (simply) on the plains; cf. *kʷteros ‘who of two’. In several languages these suffixes were used for normal comparative purposes:

Skt. jūṣṭa-tara-, jūṣṭa-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. *h₁m-o-s ‘my’: loc.sg.f.
b. *gʷrh₂-u-s ‘heavy’: acc.sg.f.
c. *med₁ío-s ‘middle’: loc.sg.n.
d. *dʰrug₁-uent-s ‘deceitful’: nom.sg.f.

Exercise 45
Reconstruct PIE preforms of the following forms:

a. Lat. senior ‘older’ (nom.sg.m.)
b. Lith. pirmus ‘first’ (acc.pl.m.)
c. Skt. śuci ‘bright’ (nom.sg.n.)
d. Skt. pūrvī ‘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. purū ‘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. pilnas, Skt. pūrṇā- ‘full’.

Exercise 47
Translate into PIE (the stem of each noun or adjective is given):

a. ‘To an older (*sen-is-) man (*h₂n-r-, HD)’
b. ‘With winged (*pt-n-uent-, HD) words (*uekʷ-s-, PD)’
c. ‘(I saw) a big (*meǵ-h₂-) bitch (*k₁u-n-ih₂-, 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. enklânein ‘to lean against’). A single enclitic pronominal form is often used for more than one case (for example, Modern Greek toûs for the genitive and the accusative, as opposed to accented autôn, autoûs).

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. hic ‘this’, but nom. pl. hi ‘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. *seh₂, n. *tod ‘this, that’: (e.g.) Skt sá, sá, tád; Gr. ho, hé, tó. The inflection is given in the following section.

*h₁,e, f. *(h₁)i, n. *(h₁)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:

*kí ‘here’ is found in OCS sə, sì, se and Lith. šis, ši. In Germanic there are traces of it: Goth. acc. hina; E. he derives from it. In Hittite kás ‘this’ derives from this stem. It may also be preserved in Gr. keíνος < *ke-en-.

*h₂en ‘there’ has given OCS ono, Lith. anás ‘that. Perhaps one finds it transformed in *eno- in Gr. keíνος ‘that’ from *ke-en-.

*h₂e, ‘away, again’ appears in Av. OP a+d-, OCS oνο ... oνο > ‘the one ... the other’. In the zero grade *h₂u it was combined with *so in Gr. hóutos, Skt. a-sau, Av. hāu.

*b₁o/e ‘that’ is found in Hitt. -pat ‘the same, even’ < *-b₁od, apā- ‘that (one)’ < *h₁o-b₁o-, Av. bā cataphoric particle, Gr. phē ‘like, as’, OCS bo ‘for’, Lith. bā ‘really’, bè ‘if’, Goth. -ba- ‘even’.

b. Inflection

We shall first look at the inflection of *so, and of Hitt. kás (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. *tôd; 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 substantivatives). 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 < *tēso 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 *h₁éso of the pronoun *h₁,e; this implies that to- probably had no genitive of its own. Gr. toû < *to + *so. — Gen. fem. Sanskrit points toward *te/o + *seh₂ (see below), Gothic towards *te + *seh₂. — 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 *þazmē < *tosm-ēh₁, an instrumental form; ḫe < *teh₁. 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. siān, gen. siēl ‘one’; as *si-h₂ it may also be preserved in Gr. īa ‘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 piz- < *tes- next to pai- < *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 -bhīs.

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 <
*kōs; the neuter form is unexplained (apāš ‘that’ has apāt < *-od); kīn < *kom; kēl has
-ēl as genitive ending, which is unexplained. There is little that can be said about
the other forms. — Plur. kē < *kōi (the neuter form is unclear); kūs has the normal accusa-
tive plural ending of Hittite; kēnzan < -*ns-om, but the -n- is unexplained.

The inflection of *h₁e-/*h₁i- (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 pro-
noun *h₁e in all forms except the nominative and the accusative. OE (h)e and OHG
e(r) also point towards *(h₁)e. Nom. ntr. Gothic has a particle, as in the accusative.
Nom. fem. Skt. iyām < *ih₂ + -am. Gothic has added *s-, giving *s-ih₂ (E. she), taken
from (*so) *seh₂. 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 < *h₁eso. Skt. asyā as in tāsyā.
Latin eius is unexplained. — Dat. Latin ei is unclear. Sabellian retains traces of *esm-:
loc. Umbr. esmik ‘on this’, South Picene esmín ‘in this’. — Ins. Unclear; *h₁ei?

Plural. *h₁e-i in Latin ī; Goth. eis < *h₁ei-es. The acc. sg. Skt. im-ām 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).
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<td>idám</td>
<td>imám</td>
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<tr>
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<td>= is izos *h₁éso *h₁eseh₂s?</td>
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<td>asyás</td>
<td>eó</td>
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<td>asyái</td>
<td>eí</td>
<td>= imma izai *h₁esmōi *h₁esieh₂i</td>
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<td>ayá</td>
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<td>*h₁ei?</td>
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### PLURAL

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<td>imás</td>
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<td>imá</td>
<td>imás</td>
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<td>ásám</td>
<td>eōrum</td>
<td>eārum izi ijo ijo *h₁éso(m) =</td>
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<td>ábhys</td>
<td>is</td>
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<tr>
<td>dat.</td>
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<td>ábhys</td>
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<td>ású</td>
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<td>*h₁eisu =</td>
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<tr>
<td>ins.</td>
<td>ebhís</td>
<td>ábhís</td>
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<td>*h₁eibhi =</td>
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</table>
*kw*e-/kw*i*-; adj. *kw*o-. 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. kās, kā, kā-tax, OCS koto, četo, Hitt. kuis, kuit; Gr. tis, tis; Lat. quis, quid, adj. qui, quae, quod; Goth. hwas, hwo, hwa.

*kw*ote-ro- ‘who of two’ is derived from this stem with the suffix -tero-. Skt. katará-, OCS kotoryju, Lith. katrás, Gr. póteros, Lat. uter (where *k- < *kw* has disappeared), Osc. pútúrúsípí ‘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. ku, Av. kú ‘where’, Skt. kútra, Av. kuþra ‘where’, Lith. ku’r ‘where’, OCS kde ‘where, when’; Oscar puf, Lat. ubi ‘where’ < *kw*u-dh- (<*kw* restored from *kw*o-, *kw*i-), Alb. kush ‘who’ < *ku-so.

b. Inflection

*kw*o- was inflected in the same way as *so. Lat. quī < *kw*o-i, with a deictic -i (quaet is also *qua + i), shows that the nominative had no -s.

The inflection of *kw*e-/kw*i*- is very exciting. There is only one form for both masculine and feminine.

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<tr>
<th></th>
<th>Av.</th>
<th>OCS</th>
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<td>-ciť</td>
<td>kőto</td>
<td>četo</td>
<td>kus</td>
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<td>-cim</td>
<td>-ciť</td>
<td>(kogo)</td>
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<td>kogo</td>
<td>česo</td>
<td>kuël</td>
<td>téo</td>
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<td>quó</td>
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<td>koma</td>
<td>česomu</td>
<td>kuédani</td>
<td>téoi</td>
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<td>kā/kana</td>
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**PLURAL**

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<th>ci-(ca)</th>
<th>kúies</th>
<th>tínes</th>
<th>tína</th>
<th>quēs</th>
<th>(qua)</th>
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<tbody>
<tr>
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<td>nom.</td>
<td><em>kw</em>e</td>
<td><em>kw</em>o</td>
<td>kuies</td>
<td>tínes</td>
<td>tína</td>
<td>quēs</td>
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<td>acc.</td>
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<td><em>kw</em>om</td>
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<td><em>kw</em>eso</td>
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<td>abl.</td>
<td><em>kw</em>ed?</td>
<td><em>kw</em>osmòd</td>
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<td>loc.</td>
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<td><em>kw</em>osmi</td>
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<td>ins.</td>
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<td><em>kw</em>eh₁</td>
<td><em>kw</em>oi</td>
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<tr>
<td>pl.</td>
<td>nom.</td>
<td><em>kw</em>ei</td>
<td><em>kw</em>eh₂</td>
<td><em>kw</em>oi</td>
<td><em>kw</em>h₁</td>
<td><em>kw</em>eh₂</td>
<td>es?</td>
</tr>
</tbody>
</table>
Nom. Avestan has kō < *kwos alongside -ciš, OCS kò- < *kw-ö-, the other languages point towards (*kwis). The Celtic forms, OIr. cia, W. pwy, reflect *kw-ëi, so the nominative must have been *kw-ë; the additional element *-i is also found in Lat. qui < *kw-o-i. We then get the same pattern as in the pronoun *h,e, *im. — In several languages *kw-o-took the place of masc./fem. *kw-e, *kw-im, *kw-e-, while the old form was retained in the neuter. — Acc. Greek added to *too the ending -a (cf. póda < *-më). Other forms were subsequently made from to-, gen. to-ös, dat. to-i. Slavic uses the genitive for the accusative. — Gen. OCS and Greek point toward *kweso, 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 *kw-o-, *kw-i- or *io-, the o-stem derived from (*h-e-)*i-. Which of the two was the original relative is disputed. The interrogative (*kw-o-) 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 *kw-i- 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 *kw-o-.

Exercise 48

a. Explain why the inflection of *kw-e/*kw-i- 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. sic ‘thus’ < *seike
Lat. topper ‘just then’ < *todper
Lat. citró ‘to this side’ < *kiteród (abl.sg.)
Umbrian esnik ‘on this’ < *esnike
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 *h₁e; 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 < *h₁eHom). Old Avestan has azə < *h₁eHom once. Hitt. úk has its -u- from ammuk, OCS azə for *jazə < *eHom with lengthening of *e according to Winter-Kortlandt’s law.

— Acc. Greek and Hittite point toward *h₁me, 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 *h₁mene; in both languages this form is completely inexplicable, so it must be an old inheritance. Greek has *h₁me-so (cf. *h₁e-so). Hittite has -el 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. mihi has the normal dative ending -ei. Gr. emoi is (in origin) the enclitic form. Goth. mis (OHG mir) is unclear. — The locative and the instrumental are unclear.

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<td>úk</td>
<td>egō</td>
<td>egō</td>
<td>ik</td>
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<td>acc.</td>
<td>mām, mā</td>
<td>mene</td>
<td>mene</td>
<td>ammuk</td>
<td>emé</td>
<td>mē</td>
<td>mik</td>
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<td>mene</td>
<td>manēs</td>
<td>ammēl</td>
<td>eméo</td>
<td>mei</td>
<td>meina</td>
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<td>mād</td>
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<tr>
<td>dat.</td>
<td>máhya(m)</td>
<td>mūnē</td>
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<td>ammuk</td>
<td>emo</td>
<td>mī</td>
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<td>mūnoj</td>
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### Chapter 15. The Pronoun

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<td>sū</td>
<td>tū</td>
<td>þu</td>
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<td>tebe, tē</td>
<td>tavē</td>
<td>tuk</td>
<td>sē, se</td>
<td>tē</td>
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<td>tebe</td>
<td>tavs̩</td>
<td>tuēl</td>
<td>sēo, seo</td>
<td>tui</td>
<td>þeina</td>
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<td>þus</td>
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<td>távimi</td>
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<td>wēs</td>
<td>hēmeis</td>
<td>nōs</td>
<td>weis</td>
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<td>asmán, nas</td>
<td>naṣ, ny</td>
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<td>anzās</td>
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<td>nōs</td>
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<td>mūsỵ</td>
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<td>nōstri</td>
<td>unsara</td>
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<td>nōbīs</td>
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<td>jūs</td>
<td>sumēs</td>
<td>hūmeis</td>
<td>vōs</td>
<td>jūs</td>
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<td>vaṣ, vy</td>
<td>jūs</td>
<td>sumās</td>
<td>hūmeas</td>
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<td>izwis</td>
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<td>jūsỵ</td>
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<td>vōstri</td>
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### PIE

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<td>*tuH</td>
<td>*uei</td>
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<tr>
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<td>*h₁mḥ,*h₁me</td>
<td>*tué</td>
<td>*nsmé,*nōs</td>
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<tr>
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<td>*teue,*toi</td>
<td>*ns(εr)o-,*nos</td>
</tr>
<tr>
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<td>*h₁med</td>
<td>*tued</td>
<td>*nsmed</td>
</tr>
<tr>
<td>dat.</td>
<td>*h₁mēği/io,*h₁moi</td>
<td>*tēb/io,*toi</td>
<td>*nsmei,*ns</td>
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<tr>
<td>loc.</td>
<td>*h₁moi</td>
<td>*toi</td>
<td>*nsmi</td>
</tr>
<tr>
<td>ins.</td>
<td>*h₁moi</td>
<td>*toi</td>
<td>?</td>
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‘you’ (sg.). Nom. Skt. tvám < *tuHam. Greek has the s- of the accusative; Doric still has tú. The Hittite form zik 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. *tebţio, cf. Av. taibiiā.

‘we’. Nom. Goth. weis < *uei + s (OHG wir, E. we), Hitt. wês < *uei + es. Gr. hêmeīs is the acc. *hême + 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. âmme has the shortest, and oldest form, from *nsmê (> *asme > Aeol. âmme, Att. *hême). Skt. -ān is the ending of the o-stems. Latin has the enclitic form. Goth. uns reflects *ns, whence also came Hitt. anz-. — Gen. Sanskrit and Gothic use the possessive pronoun, and Latin has the genitive of this form. OCS nas- is encl. *nôs with the ending -om. — Abl. Lat. nóbîs is an innovation (-bî- as in tibî, with plural -s?). — Dat. Skt. âsmî points toward *nsmeî. Goth. uns(is) has -is from izwis ‘you’ (pl.). — Loc. Gr. Aeol. âmmi is probably older than (hêm)-in (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. yûyâm < *iuH + y + am, with -y- from vayám. Gothic added an -s. For Hittite, Greek and Latin see the accusative. — Acc. Aeol. âmme < *usmê is the oldest form. In Hittite sum- appears, for reasons which are unclear, instead of umm-. 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):

<table>
<thead>
<tr>
<th>sg.</th>
<th>YAv.</th>
<th>OCS</th>
<th>Lith.</th>
<th>Gr.</th>
<th>Lat.</th>
<th>Goth.</th>
<th>PIE</th>
</tr>
</thead>
<tbody>
<tr>
<td>acc.</td>
<td>sé</td>
<td>savē</td>
<td>hê</td>
<td>sê</td>
<td>sik</td>
<td>*se</td>
<td></td>
</tr>
<tr>
<td>gen.</td>
<td>sebe</td>
<td>savē</td>
<td>hêo</td>
<td>sui</td>
<td>seina</td>
<td>*seue,*sei</td>
<td></td>
</tr>
<tr>
<td>dat.</td>
<td>huuāuōoia</td>
<td>sēbē</td>
<td>sāu</td>
<td>hoī</td>
<td>sibī</td>
<td>sis</td>
<td>*sebţio,*soi</td>
</tr>
<tr>
<td>encl.</td>
<td>hōi</td>
<td>sī</td>
<td>hoī</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>sphē(as)</th>
<th></th>
<th>sphēōn</th>
<th>sphī(sī)</th>
</tr>
</thead>
</table>

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 svayām ‘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-þhio, Lat. sibi < *sēbþei. 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. speis and Myc. pei (/spéis/ or /spʰeii/) point toward *sphe < *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 < *sēlbʰo-, (E. self), Ven. dat. sselboi sselboi.

### 15.3.3 The possessives

The possessives (‘my’, ‘your’, etc.) have the following shape:

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>Av.</th>
<th>OCS</th>
<th>Lith.</th>
<th>Arm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*h₁mos</td>
<td>-</td>
<td>ma-</td>
<td>moi</td>
<td>māno</td>
<td>im</td>
</tr>
<tr>
<td>*tuos</td>
<td>tvá-</td>
<td>ðβa-</td>
<td>tvoi</td>
<td>tāvo</td>
<td>k’o</td>
</tr>
<tr>
<td>*suos</td>
<td>svá-</td>
<td>x’a-</td>
<td>svoi</td>
<td>savo</td>
<td>iwr</td>
</tr>
<tr>
<td>*nsos</td>
<td>asmáka-</td>
<td>ahmáka-</td>
<td>našo</td>
<td>múšo</td>
<td>mer</td>
</tr>
<tr>
<td>*usos</td>
<td>yušmáka-</td>
<td>yušmáka- (xšmáka-)</td>
<td>vašo</td>
<td>jášo</td>
<td>jer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-mis</td>
<td>(à)mis</td>
<td>emós</td>
<td>meus</td>
<td>meins</td>
</tr>
<tr>
<td>-tis</td>
<td>tuwas</td>
<td>sós, teós</td>
<td>tuus</td>
<td>þeins</td>
</tr>
<tr>
<td>-sis</td>
<td>hós, heós</td>
<td>suus</td>
<td>seins</td>
<td></td>
</tr>
<tr>
<td>-summis</td>
<td>azis?</td>
<td>ámmos, hêméteros</td>
<td>noster</td>
<td>unsar</td>
</tr>
<tr>
<td>-smis</td>
<td>uzis?</td>
<td>ūmmos, hûmêteros</td>
<td>vester</td>
<td>izwar</td>
</tr>
<tr>
<td>-smis</td>
<td>sphós, sphéteros</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The agreement between Av. ma- and Gr. emós; Skt. tvá-, Av. ðβa-, Arm. k’o, Gr. sós and HLUw. tuwas 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. ἀμμος, ἀμμος < *nsmos*, *usmos* appear in structure similar to the forms for the singular. One also finds them in Skt. asmáka- < *nsmó-kо-, 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 *iw*r < *seuro-), *-ero-* (Germ.) and *-tero-. Hittite has *summis* 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. (Odyssey 1 27): οὐ τοι ἐγό γε / ἡς γαῖς δύναμαι γλυκέρων ἄλλο (w)ιδέσθαι ‘I can /see nothing (else) that is sweeter than (my) own country’ (‘There is for me nothing more sweet…’) with ἡς < *suās* gen. sg. f. from *su-o-.

### 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.; tou ‘you’ nom.sg., ionus ‘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)li-moi/me, tand ‘your’ acc.sg.m. < *tom-toi/t(u)e, jone ‘our’ nom.sg.f. < *ejā-nos, yj ‘your’ nom.sg.m. < *(e)li-uos, juoj f. < *ejā-uos. 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. oinē ‘one’ found on the die). This may point to *Hoi(H)nos, but OCS ino (next to jedinos) is unclear, for which reason the reconstruction is uncertain; the Baltic forms also present problems. The stem *Hoi(H)nō- can be related to OP aiva-, Gr. oï(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 sama ‘self’), acc. sēm-m, gen. smōs, dat. sm-ēi (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. ia ‘one’ may also be based (*si-h₂). The more common feminine of *sm- is *sm-ih₂ (Gr. mía, Arm. mi).

‘Two’. This word was originally inflected as a dual: Skt. dvā < *duo-ḥ₁, fem. ntr. dvē < *duo-ḥ₁. The old genitive (Skt. dvāyos < *duoiHous) still survives in Germanic: Goth. twaddjē, with -ddj- < - pérd- due to ‘Verschärfung’, that is, the development of a glide (*jj) to an obstruent (ddj). OHG zweii is based on the neuter. Several languages reflect a form *duyo- with vocalic u. Arm. -ku < *duoḥ₁, with er- taken from ‘three’. The -u of Skt. dvāu and the short -o of Gr. δύο have not been satisfactorily explained.

‘Three’ was inflected as a (plural) i-stem: *trei̯es, acc. trins, gen. trei̯om, loc. trisu etc.; ntr. tri-h₂. The feminine has a strongly deviant form: Skt. tirsás, OIr. teoir, both from *tisres. The element -s(o)r- might also appear in Hitt. hassussara- ‘queen’ (from hassu- ‘king’).
<table>
<thead>
<tr>
<th>PIE</th>
<th>Sanskrit</th>
<th>OCS</th>
<th>Lith.</th>
<th>Armenian</th>
<th>Albanian</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>*Hoi(H)nos</td>
<td>ēkas</td>
<td>jedīnъ</td>
<td>vienas</td>
<td>mi</td>
</tr>
<tr>
<td>2</td>
<td>*duo₁</td>
<td>dvā(u)</td>
<td>dēva</td>
<td>dū</td>
<td>erku</td>
</tr>
<tr>
<td>3</td>
<td>*treies</td>
<td>trúyas</td>
<td>trője</td>
<td>tr̥s</td>
<td>erekʼ</td>
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<tr>
<td>4</td>
<td>*kʰeturō</td>
<td>cätvārās</td>
<td>čētyre</td>
<td>keturī</td>
<td>č̥orkʼ</td>
</tr>
<tr>
<td>5</td>
<td>*penkʷe</td>
<td>pānca</td>
<td>pętъ</td>
<td>penki</td>
<td>hing</td>
</tr>
<tr>
<td>6</td>
<td>*(s)uēks</td>
<td>sās</td>
<td>šestъ</td>
<td>šēši</td>
<td>vecʼ</td>
</tr>
<tr>
<td>7</td>
<td>*séptm</td>
<td>saptá</td>
<td>sedmъ</td>
<td>septyni</td>
<td>ewt’n</td>
</tr>
<tr>
<td>8</td>
<td>*h₂ekth₂</td>
<td>āstā(u)</td>
<td>osmъ</td>
<td>aštuoni</td>
<td>utʼ</td>
</tr>
<tr>
<td>9</td>
<td>*(h₁)néum</td>
<td>náva</td>
<td>devetъ</td>
<td>devyni</td>
<td>inn</td>
</tr>
<tr>
<td>10</td>
<td>*dékmt</td>
<td>dása</td>
<td>desętъ</td>
<td>dešimt</td>
<td>tasn</td>
</tr>
<tr>
<td>11</td>
<td>*duidkmti</td>
<td>viṁsāti</td>
<td>dova desętъ</td>
<td>dvi-desimt</td>
<td>k’san</td>
</tr>
<tr>
<td>12</td>
<td>*trih₂komth₂</td>
<td>trimsāt</td>
<td>troje desętę</td>
<td>trīs-</td>
<td>erē-sun</td>
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<tr>
<td>13</td>
<td>*kʰetur₂</td>
<td>cätvārinśāt</td>
<td>čētyre desętę</td>
<td>kēturias</td>
<td>kāra-sun</td>
</tr>
<tr>
<td>14</td>
<td>*penkʷe₂</td>
<td>paṁcāsāt</td>
<td>pętъ desętъ</td>
<td>peńkias</td>
<td>yi-</td>
</tr>
<tr>
<td>15</td>
<td>*uks-</td>
<td>šatī</td>
<td>sestъ desętъ</td>
<td>šēšias-</td>
<td>valʼ-</td>
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<tr>
<td>16</td>
<td>*septm-</td>
<td>saptatī</td>
<td>etc.</td>
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<td>ewt’ana-</td>
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<td>17</td>
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<td>aštuoni</td>
<td>aštuonias</td>
<td>utʼ-</td>
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<td>navatī</td>
<td>devynias</td>
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<td></td>
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<tr>
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<td>*dəkmtōm</td>
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<td>seto</td>
<td>šiṁtas</td>
<td>hariwṛ</td>
</tr>
<tr>
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<td>*gēs-l</td>
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<td>tysošti</td>
<td>tūkstantis</td>
<td>hazar</td>
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<td>*prh₂uō-</td>
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<td>pruvyjah</td>
<td>pirmas</td>
<td>arājin</td>
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<td>dvitāya-</td>
<td>vestoryjah</td>
<td>antras</td>
<td>ērk-rod</td>
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<tr>
<td>3rd</td>
<td>*triō-</td>
<td>trītīya-</td>
<td>tretiō</td>
<td>trėčias</td>
<td>er-</td>
</tr>
<tr>
<td>4th</td>
<td>*kʰturō-</td>
<td>turīya-</td>
<td>četvrtstyjah</td>
<td>ketvrtas</td>
<td>ĭor-</td>
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<tr>
<td>5th</td>
<td>*pnkʷō-</td>
<td>pañcamā-</td>
<td>pętyjah</td>
<td>peńkatas</td>
<td>hîng-erord</td>
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<tr>
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<td>*uxks</td>
<td>šatadhā-</td>
<td>šestyjah</td>
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<td>vecʼ-</td>
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<tr>
<td>7th</td>
<td>*s(e)ptmō-</td>
<td>saptātha-</td>
<td>sedmyja</td>
<td>septiṅtas</td>
<td>ewt’n-</td>
</tr>
<tr>
<td>8th</td>
<td>*h₂ekth₂uō-</td>
<td>aštāmahā-</td>
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<td>aštunias</td>
<td>utʼ-</td>
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<tr>
<td>9th</td>
<td>*h₂neun-</td>
<td>navamā-</td>
<td>devet’yah</td>
<td>devinías</td>
<td>inn-</td>
</tr>
<tr>
<td>10th</td>
<td>*d(e)kmtō-</td>
<td>dasamā-</td>
<td>desętyah</td>
<td>dešimtās</td>
<td>tasn-</td>
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<tr>
<td>Toch. A/B</td>
<td>Greek</td>
<td>Latin</td>
<td>OIr.</td>
<td>Goth.</td>
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<tr>
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<td>unus</td>
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<td>dáo</td>
<td>duo</td>
<td>da</td>
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<td>cethir</td>
<td>fidwor</td>
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<td>secht</td>
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<td>octó</td>
<td>ocht</td>
<td>ahťau</td>
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</tr>
<tr>
<td>ňu</td>
<td>ennéa</td>
<td>novem</td>
<td>noi</td>
<td>niun</td>
<td></td>
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<tr>
<td>šak/šak</td>
<td>déka</td>
<td>decem</td>
<td>deich</td>
<td>taihun</td>
<td></td>
</tr>
</tbody>
</table>

| šak sapí¹ | hén-deka | ān-decim | 1 deac | aínlf |
| šak wepí   | dődeka   | duo-    | 2 deac | twalíf |
| šak täryápi| 3 kai déka | tré-    | etc.   |       |
| šak štwarpi| 4 kai déka | quattuor- | fidwortaihun |
| šak päñpií | pentekaideka | quín- | fimfhaihun |
| šak šákpií | heksakaideka | sō- | etc.   |       |
| šak spätpií| heptakaideka | septen- |       |       |
| šak okätpií| októkaideka | duodéviginti |       |       |
| šak ňupíí | ennekaideka | undéviginti |       |       |
| wiki/ikám | eikosi  | viginti | fiche | twai tigjus |
| taryák/tāryáka | triá-konta | tri-gintà | tricho | ḫreis tigjus |
| štwarák/štwárka | tessarā- | quadrā- | cetharcho | etc.   |
| pñák/p(i)šáka | pentē- | quinquā- | coico |       |
| sáksákšaska | heksē- | sexā- | sesco |       |
| šäptuk/suktanka | hebdomē- | septuā- | sechtmogo | sibuntehund |
| oktkuk/oktkanka | ogdoē- | octō- | ochtmogo | ahtuatehund |
| nmuk/ñumka  | enenē- | nóñā- | nócho | niuntehund |
| kánt/kante  | hekatôn | centum | cét | taihuntehund |
| wälts/yaltse | khiliōi | mille | mile | þūsundi |

²/pärweše  | prótos | primum | cētnae | fruma |
| wät/wate  | deuterōs | secundus | tanaisē | anpar |
| trit/trite | trítos | tertius | triss | ḫridja |
| štārt/sharte | tētartos | quartus | cethramad |       |
| pänt/pinkte | pēmplos | quintus | cóiced | fimfta |
| škāš/shaste | háctos | sextus | seïssed | saihsa |
| šāptānt/šuktante | hēbdomos | septimus | sechtmado |       |
| oktānt/oktante | ogdoos | octāvus | ochtmado | ahtuda |
| *ñunt/ñunte | énatos | nóñus | nómad | niunda |
| škānt/škante | dékatos | decimus | dechmad | taihund |
'Four' also had plural forms (*kʰétuor-es, -uér-ns, -ur-om, etc.), its feminine taking the same suffix as found with 'three': *kʰetur-sr-. There was, perhaps, also a singular form, *kʰétuør, among others in Lat. quattuor, Goth. fidwor.

'Five' was *penkw-e. OCS has a form in *-tis.

'Six'. Many forms seem to point to *seks, others towards *sueks (Av. xšuuaš, Gr. Delph. uks, Gaul. suexos). PIE possibly had *ueks (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 mn of Greek is difficult. It has been proposed that d- was taken over from *dékmt 'ten', after which the preglottalized d yielded 'dn- > enn-.

'Ten'. Notice the parallel structure with one full grade, of *séptm, *h₁néun, *dékmt.

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 *leikʷ- 'to leave', but the comparison raises several problems.

16.1.3 The decimals

'Twenty' was *dui-dkmt- '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 i (as in Lat. viginti 'twenty'), Gr. -mē-, Lat. -rā- from -mār, -rā- (as in Gr. hebdomékonta, Lat. quadrāgintā). A trace of the glottal stop of the first d- can still be seen in the e- of Gr. eikosi < *ewikosi. The ṭ behaves in the same way as does *h₁. Original *mē in -(d)km- is still reflected as a in Gr. Dor. wikati.

As of 'thirty' we find *-dkmt-h₂, as in Gr. triákonta. Germanic has Goth. (sibunte)-hund as of 'seventy'; for 'twenty' to 'sixty' we find twai tigius 'two ten(s)', etc.

16.1.4 From 'hundred' to 'thousand'

The word for 'hundred' originally meant 'tenth', thus 'tenth ten', originally *dkm-t-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. *ewikosi '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. *prija 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. sahāsram could point to *ghesl- if sa- contains < *sm- ‘one’, and combined with Gr. khlíoi, Dor. khléioi < *ghesl-. The Germanic forms, Goth. þúsundi, are related to the Balto-Slavic ones, OCS tysēštī, -spštī, Lith. tūkstantis. 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. pūrva- and OCS prvo (cf. Toch. B pärwesē) point to *prH-uō-, Lith. pirmas, OE forma to *prH-mō-; Gr. prōtos probably also belongs here. Lat. prīmus and Alb. parē have the same *pr- (Arm. araf means ‘in front of’).

For ‘second’ a word meaning ‘other’ is often used: *h₂enteros (Lith., OCS, Goth.), *h₂eleros (Latin), *h₂elio- (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-to-, *tr-t-io-).

The oldest form of ‘fourth’ is *kʷtūr- (with -io- in Skt. tur-īya-; Lat. quārtus from *kʷwεrto- < *kʷtōr-to-); usually *(kʷ)e- was restored: *kʷetur-.

‘Fifth’. Most of the forms go back to *pēnkʷtō-. Skt. pakthā-, OHG funfto point to a zero grade, perhaps in -o-, so perhaps *pnhʷ-ó-.

‘Sixth’. Opr. uschts points to a zero grade *uks-. Av. puxḍa- ‘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 *septmō-. With zero grade in the root, one would expect *sptmō- (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 *h₃(e)kth₁-uō-. Greek has -gd- after ‘seventh’.

‘Ninth’. Gr. ἐννατός points to *h₃nyṇ- to-, Lat. nōnus comes from *noueno-; PIE must then have had *h₃nun-ō-.

‘Tenth’ seems to have been *dekmt-ō-, though the expected form (with zero grade of the root) would be *dktm-ō-. See further under ‘hundred’. Suffixal -t- in the other ordinals ultimately comes from ‘tenth’.
16.3 Collective adjectives

There were adjectives with collective meaning:

*duoHoś ‘double’: Skt. dvaya-, OCS dovoji, Lith. dveji, Gr. doió (Lat. bini, Goth. tweihnaî, Oic. tvennr). — ‘Both’ is found as Skt. ubhàu, OCS oba, Lith. abû, Gr. ámphô, Lat. ambô, Toch. A âmpi, Goth. bai (cf. E. both). The initial part of the form resists reconstruction; then -bho- followed with the same inflection as ‘two’. Adjective: Skt. ubhaya-, OCS oboji, Lith. ajeji.


*kweturo- ‘fourfold’, Skt. catvaram, OCS ṇetvori, Lith. ketveri, Lat. quaterni.

16.4 Adverbs

For ‘once’ no PIE form can be reconstructed. One finds Skt. sa-kft, Gr. há-pks, both with sm-, Lat. semen < *s(e)m- (cf. simplex ‘simple’).

*duis, *tris ‘twice, thrice’: Skt. dvis, tris, Gr. dis, tris, Lat. bis, ter, Oic. tvis-var, þris-var.

*kwetur-s ‘four times’: Skt. catuḥ < *-ur-s, Lat. quater.

16.5 Compounds

In compounds we find:

*sm- ‘one’; see further under the adverbs.

*dui- ‘two’: Skt. dni-pát, Lith. dni-kójis, Gr. di-pous, Lat. bi-pês, OE twi-fête ‘two-footer’.


*kwrur- ‘four’: Skt. catur-akṣa- ‘four-eyed’, Av. caḍru-gaọśa- ‘with four ears’. Gr. trā-peza ‘table’ < ‘four-footer’ < *(kw)t(y)-ped-ih₂, perhaps also trupháleia ‘with four crests’ (of a helmet), Lat. quadrupēs ‘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 Olr. and PIE forms to arrive at your solution.

c. Translate into PIE:

'The third man (*h₂ner-, HD)' (nom.sg.)
'(We saw) the lady (*potnih₂-, PD) twice'
'(I have) two names (*h₃néh₃-mn-, n.)'
'To one of the first immortals (*n-mrö-)’
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

Nominaive. Few adverbs are nominatives:

Lat. aduersus ‘against’ (literally, ‘directed or turned towards’); perhaps Lat. satis ‘enough’
Neutral forms can also be accusatives:

Lat. primum, Gr. prōton ‘first’

Accusative. The accusative is found very often.

Accusative of content:

Lat. statim ‘at once’ (literally ‘state’); Gr. hēdū (gelān) ‘(to laugh) sweet, tasty’; Gr. polú, pl. pollá, OCS mānogō, Lat. multum, Goth. filu ‘much, often’

Accusatives of space or time:

Gr. dēn ‘long time’ < *duān < *duh₂-m; OCS dān-sę ‘today’

Accusative of direction:

Lat. domum ‘home’; Skt. dūrām ‘in (toward) the distance’
From an apposition:
Gr. prôphasin ‘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. poiò ‘where?’, nuktòs, Goth. nahts ‘at night’; Lat. parvi ‘a little’ (with verbs for displaying ‘estimation’)

The ablative indicates the origin of something:
Skt. dûrât ‘from faraway’, Goth. hwâþro ‘from whence’
Here perhaps belong the Greek adverbs in -ō(s): hoûtōs ‘so’. Feminine forms are Lat. extrâ, suprâ.

The dative is seldom found.

The locative is often found:
Skt. dûre ‘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)keî ‘there’, pei ‘where?’, poi ‘where to?’, oikoi ‘at home’; Lat. domi ‘at home’, temere ‘blindly’ < *temh₁-es-i ‘in the dark’ (Skt. tâmas); OCS gorë ‘above’ (gora ‘mountain’), dobrë ‘good’

The instrumental:
Skt. divâ ‘during the day’; OCS noštajo i dombjo ‘night and day’; Gr. pó ‘in one way or another’, pópote, Dor. pépoka ‘ever’, kroupë, láthrâ ‘surreptitiously, clandestine’; Lat. grâti(i)is ‘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. hyàs, Alb. ãje, Gr. khthéz, Lat. heri (cf. hesternus ‘of yesterday’), OIr. in-dé, W. doe, Goth. gistra-, E. yesterday; the PIE form may have been *dʰjëþiës

17.1.3 Substantives and adjectives with a suffix

We find a number of forms in -dʰ-:

*-dʰi: Skt. ádhi ‘on’; Gr. póthi ‘where?’; oikothi ‘at home’. The suffix is perhaps also found in *medʰi-os ‘middle’, Skt. mádhya-, Gr. méssos, Lat. medius, Goth. midjis
*-dʰe: Skt. ihá ‘here’ (Pàli idha), kûha, OCS ko-de ‘where?’, so-de ‘here’; Gr. énerthe ‘under’, Gr. -then ‘from in póthen ‘from whence?’, ouranóthen ‘from the heavens’

Other typical adverbial suffixes are:

*-ti: Skt. iti ‘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. kur '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-o-pa '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. dēšinas, Gr. deksiós, deksitēros 'right'
*h₁eg²(s) 'out': Gr. ek(s), Lat. ex, Gaul. ex-, OIr. ess-
*h₁en 'in': OPr. an, Gr. en, eni, (*ens > eis 'to, toward'), Lat. in, OIr. i, Goth. in (secondary zero grade in OCS ṃ, OPr. en, Lith. i-). Hence *h₁enter 'between, inside': Skt. antār, Lat. inter, OIr. eter
*h₁épi, *h₁opi 'by, at, towards': Skt. āpi, Arm. ēw, Hitt. āppa(n), Gr. épi, Myc. oπi, Lat. ob
*h₁eti, *h₁oti 'over': Skt. áti, OCS otā, Gr. éti
*h₂ed 'to, by': Lat. ad, Goth. at
*h₂en 'along in an upwards direction': Av. ana, Gr. ána, Goth. ana
*h₂enti 'over against': Skt. ánti, Lith. an̄t, Arm. ən̄d, Hitt. hantī, Gr. antí, Lat. ante, Goth. and- (the locative of a word for 'front, face', Hitt. hanza /han-t-s/)
*h₂épo, *h₂pó 'from, as of': Skt. ápa, Gr. ápō, Lat. ab, Goth. af, E. af; from *h₂pó Lat. po- in pōnō 'to lay' < *po-sinō, OS fā-n, G. von, Slav. pō- (Slav. pā- from *h₂pó before HC-)
*h₂eu 'away from': Skt. áva, OCS u-, OIr. ó, ua
*h₂mbʰi 'around': Skt. abhī-tas, Gr. amphí, Lat. amb- (amb-itus 'going around' in E. ambition), Gaul. ambi, OIr. imb-, OHG ambī
*h₂ebʰi, *(h₂)bʰi 'towards': Skt. abhī, OCS obā, Lat. ob; Goth. bi
*knt- 'by, along': Hitt. katta, Gr. kāta, OIr. cēt, OW cant. Perhaps *knt- is derived from *kο(m). *kmti in Greek kasi-gnētos 'brother' < 'born together with'; Gr. *kasi > kai 'and'
*kο(m) 'together, with': Lat. cum, OIr. co, Goth. ga-
*meth₂ (?) 'between, with': Gr. méta, Goth. miþ, G. mit
*nd̂er(i) ‘under’: Av. adāiri, Goth. undar, E. under (cf. Skt. ādhara-, Lat. inferus ‘the lower one’)

*ni ‘downward’: Skt. nī, OCS ni-zō, OHG nidar, E. nether (cf. Skt. nītāram). It also appears in the word for ‘nest’, PIE *ni-sd-o- (to sed- ‘to sit’): Skt. nīdā-, Arm. nist, Lat. nidus, W. nth, OIr. net, E. nest, transformed in OCS gnězdo, Lith. līzdas.

*péri ‘over’: Skt. pārī, Gr. péri

*pos ‘after’: Skt. paścād, Lith. paskūi, Lat. post

*poti ‘(over) against’: Av. pātī, Gr. póti. The relationship with *proti is unclear.

*prēh₂j ‘at the front’: OCS prēdō, Lat. prae (this form seems to be an original locative; cf. *prh₂ós)

*prēti, *proti ‘(over) against’: Skt. prātī, OCS protivo, Gr. próti, prós, Ael. près

*prh₂ós ‘before’: Skt. purās, Gr. pâros. This form looks like a genitive belonging with *prēh₂j. Skt. purā, Goth. faura (E. for) are based on prh₂-; perhaps they continue the instr. *prh₂-ēh₁

*pro ‘before, towards the front’: Skt. prā, OCS pro, Lith. pra-, Gr. pró, Lat prōd-, OIr. ro-, Goth. fra- (E. from)

*(s)nh₁j, *(s)nh₁(e)u ‘without’: Skt. sanu-tār, Toch. sne/snai, Gr. áneu, Lat. sine (< *seni < *snh₁j), OIr. sain. From *sn-ter: Gr. áter, MHG sunder

*sm ‘together’: Skt. sám, OCS sō, Lith. sam-

*trh₂ós ‘through’: Skt. tīrās, OIr. tar. From the same root Goth. ūairh (*ter(h₂)-kʷe?) and OHG durh (*tr(h₂)-kʷe?)

*ud ‘up, on high’: Skt. úd, OCS vy-; Goth. üt (G. aus) has a long ü, maybe from lengthening in a monosyllable.

*upér(i) ‘over’: Skt. upārī, Gr. húper, Lat. s-uper (the s- is unclear), OIr. for, Goth. ufar, E. over

*upō ‘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. nā, OCS ne, Hitt. na(tta), Lat. ne-que, Goth. ni(-h). *ne-i: Av. naē-(ciš), OCS ni-(kāto), Lith. nei, Lat. nī. *nē: Lat. nē, OIr. ní, Goth. nē. E. none < *ne *oinos, Lat. nōn < *ne oinom. Gr. ou ‘not’ reflects *ne *h₂iou ‘not ever’, from which ne disappeared, as ne in spoken French ne pas. — In compounds we find *n-; see Section 11.5.2.

In prohibitions, the clause was negated by means of:

*mēh₁: Skt. má, Arm. mī, Toch. B mā, Gr. mé, 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’
*ɡe: Gr. ge, Goth. -k in mi-k ‘me’, au-k ‘because’, G. auch
*ɡʰi: Skt. hí, Av. zi ‘for, because’, OCS -zi, Gr. -khi. Skt. nahí, Gr. oushí ‘certainly not’. The Latin pronoun hic ‘this’ is based on it.
*ɡʰw/o: Skt. gha, ha, OCS -že, -go; perhaps Gr. -the
*h₁e is identical with the pronoun *h₁e: Skt. a-sáu ‘that’, Russ. etot ‘this’, Gr. ekei ‘there’, Osc. etanto ‘so much’ (for *h₁éti see Section 17.1.5)
*h₂en interrogative particle: Lat. an, Goth. an
*ke: Lith. še ‘hither’, Lat. -c(e), OLat. ntr. hocce ‘this’ < *hod-ke
*ne ‘like’: Skt. ná, Lith. nei
*nu ‘now’: Skt. nū, nú, OCS nynė, Lith. nū, Hitt. nu, Gr. nu, nūn, Lat. nunc, OIr. nu, no, Goth. nu
*-pe: Lith kaip-p ‘how’, Lat. quip-pe ‘because’
*r: Lith. iř ‘and, also’, Gr. ra, ar, ára ‘thus, as known’
*sme(h₁): Skt. smā; Gr. mēn, mān? ‘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. senátus populusque ‘the senate and the people’; twice in Skt. devás cásurās ca (< devás ca ásurās ca) ‘Gods and Asuras’, Gr. patér andrōn te théōn te ‘father of men and gods’.
*-u-e’or’: Skt. Av. vā, Gr. ē-(w)e, Lat. -ue, Toch. B wa-t. Skt. naktam vā dīvā vā ‘during the night or during the day’
Most of the conjunctions are derived from relative pronouns (*io- or *kwo-), for example:

*iød, *kwo’d ‘that’: Skt. yād, Gr. hō, hōti ‘that’, hōte ‘when’; Lith. kād, Lat. quod, cum < quom; Goth. ḫat-ei from *tōd
*iō (*ioH?), *iōd ‘how, as’: Skt. yād, Gr. ḫo(s), Myc. jodososi /jō-dōsoni/ ‘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.

*a (>*h₂eh₂?) (surprise, pain): Skt. ā, Lith. (a)ā, Gr. ā, Lat. ā, ah, Goth. o
*aɪ (*h₂ei?) (surprise, pity): Skt. e, ai, Av. āi, Lith. aɪ, ai, Gr. ai, aiai, Lat. ai. Note that Skt. e is the regular phonetic development, as is Goth. o in the preceding lemma.
*bh₂eu, *bh₂ū (pain): Gr. pheù, phū, Lat. ûu, ū
*h₁ē (exclamation, vocative particle): Skt. ē, Lith. ē, Gr. ē, Lat. eh (ē-caster ‘by Castor’); perhaps OHG nein-ā ‘oh, no’; *h₁ō: Lith. o, Gr. ō, Lat. ō, OIr. ā, ā, Goth. o, E. oh
*eheu (complaint): Skt. aho, Lat. eheu
*ha (surprise): Skt. ha, Gr. hā, Lat. hā, NHG ha
*ha (laughter): Skt. ha ha, Russ. xa xa, Gr. hà hà, Lat. hahae, NHG ha ha.

Compare the verb Skt. kakhati, CS xoxotati, Arm. xaxank ‘laughter’, Gr. kakházo (< *kh-), Lat. cachinō, OHG. kachazzen.
*uai (*ueh₂i?) ‘woe’: Latv. wai, Arm. vay, Lat. vae, OIr. ōa, W. gwae, Goth. wai, E woe; Avestan ḫas vāi-ōi < *vayai and a-wuōi < *avai. Lat. vae victis ‘woe to the vanquished’. OAv. at vō vāiōi anhaiti apōmīn 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:

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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, sis, sit*, etc., would seem to be an old optative, judging by its form: *-i-* < *-ih₁-* is the hallmark of the optative. In this way the following categories were long ago inferred for PIE:

voice: active, middle

<table>
<thead>
<tr>
<th>tense</th>
<th>mood</th>
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</thead>
<tbody>
<tr>
<td>present (with imperfect); aorist; perfect (perhaps with pluperfect)</td>
<td>indicative, injunctive, subjunctive, optative, imperative</td>
</tr>
</tbody>
</table>

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’), *h₁e-, 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. bhínát ‘he split’: imf. ábhínat. 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. lk'i, 2 sg. lk'ér, 3 sg. elic ‘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. ájat, Gr. ége ‘he led’ < *h₁e-h₁éget; OAv. as ‘he was’ (for *ás) was still disyllabic, latas/ < *h₁e-h₁est.

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. ἑλυθε 'he came' < *h₁e-h₁ludʰ-et, compare without augment OIr. luid 'he went' < *h₁ludʰ-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-dork-e 'he has seen': Skt. dadārśa, Gr. dédorke
*ste-stoud-e 'he has bumped': Goth. staí-staut (-ai- [ε], generalized from *e before h, hw and r, where *e became -ai-)
*sti-st(e)h₂- 'stand': Skt. tīṣṭhati, Gr. histēmi (< *si-st-), Lat. si-st-ō, pf. ste-t-i
*h₁le-h₁loudh-e 'he has come': Gr. elélouthe (in Greek this was called the Attic reduplication; incorrectly, because it is found in all of the dialects)
*h₂e-h₂nok-e 'he has reached': Skt. ánāśa, OIr. t-ānaic (t- < to-) has replaced
*h₂ne-h₂nok-e
*h₂j-h₂er-ti 'he sets into motion': Skt. iyarti

In some languages the vowel is made identical with that of the root: Lat. cucurri 'I ran', momordi 'I bit', Skt. yuyója, pl. yuyujmá from *(H)i(e)ug- 'to yoke', OIr. -cúala 'to hear' < *kú-klov-. This system was not inherited from PIE.

It is disputed when *e and when *i were used in the reduplication syllable. Skt. dādāmī, Gr. didōmī '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:

*dʰé-dʰh₁-nti Skt. dādhati 'they set'
*dʰi-dʰh₁-mé Gr. tithemen '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-dík- ‘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 is the reflex of a laryngeal at the beginning of the root, so PIE *HČeR-HČeR(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-mm-ō ‘to remain’; Gr. ēkh-ō, iskh-ō ‘to hold’ < *ségʰ-, *si-ségʰ-
PIE *gʰm-īe, *gʰm-ské ‘to go’: Gr. bainō, Lat. veniō; Skt. gácchati, Gr. báskō
PIE *ǵnh₃-ské, *ǵn-n-eh₃- ‘to get to know’: Lat. nòscō, Skt. jānáti (analagical 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 *h₁,éś-ti ‘to be’: Skt. ásti, OCS jésto, OLith. esti, Hitt. eszi, Gr. está, Lat. est, Goth. ist
PIE *uék-ti ‘to wish’: 1sg. Skt. váś-mi, Av. vasá-mi, Hitt. ueur-mi (cf. Gr. hekón ‘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. sńēga, Gr. néphei, Lat. nīvit, OHG sniwwit
PIE *uégʰ-e ‘to transport (by wagon)’: Skt. váhati, OCS vezq, 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. ispant-, 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. dādāti, Gr. διδόμι, Umbr. dirsa < *di-d-āt; OCS damь, Lith. diodu < *do-dh₃ with -o- in the place of -e-, as well as lengthening and an acute accent according to Winter-Kortlandt’s law
PIE *gʰe-gʰeu-ti ‘to pour’: Skt juhómì
PIE *si-sh₁- ‘to sow’: Lat. serō (pf. sé-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 *-ēi-, *-i-.

PIE *tk-ēi-, *tk-i- ‘to build’: Skt. 3sg. kṣéti, 3pl. kṣiyánti ‘to dwell’, Gr. Myc. ki-ti-me-no /ktimenos/ ‘cultivated’
PIE *mn-ēi-, *mn-i- ‘to think’: Skt. manyate, OCS ῦνήρ, ῦνίτ (inf. ῦνëtì), Lith. mini (inf. minëti), Gr. mainomai ‘to rage’ (‘to be spiritually moved’), Olr. do-moïn-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 venire < *gʷem-je- < PIE *gʷm-iê-). Usually it is the zero grade *-i- which has served as the basis:

PIE *spék-ie ‘to see’: Skt. pāśyati, Av. spasiā; Gr. sképtomai < *skepie/o- (with metathesis); Lat. specere < *spek̑-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. mānāyati has a different meaning)
PIE *uort-éie 'to cause to turn': Skt. vartāyati, OCS vratī, Goth. (fra)-wardeīp '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. rucāyati
PIE *g� backButtonuH-éie 'to call': Skt. hvāyati, Av. zbaia- /zuṇaya-

*-ei-e- also forms denominatives, that is to say, verbs derived from a noun:
PIE *uosn-éie 'to buy, to sell': Skt. vasnāyati, Gr. ṭnéomai, from Skt. vasnā-, Gr. ṭnos '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 -āyā- (aśvāyā- '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-dik-je 'to display': Skt. dediśyāte (next to dédiś-te)

*-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 *h₁n(e)h₁-mm-ie 'to name': Hitt. lamniya-, Gr. onomaínō < -mṇ-iō, Goth. nammjan
Skt. nāmas- → namasyāti 'to honor'
Lat. cūra → cūro < *-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, -ere 'to lie'; Lith. gułti 'to go lie down' next to gulėti 'to lie'.

Balto-Slavic formed an intransitive aorist in this way: OCS smrod-ē-ti, Lith. smird-ē-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-ské 'to go': Skt. gáchati (with shifted accent), Av. jasaiti, Gr. báskö
PIE *prk-ské 'to ask': Skt. prcháti, Av. porasaiti, Arm. harc'i, Lat. poscō < *pork-skō < *prk-, OIr. arco, OHG forsｃōn, G. forschēn

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 *kleu-s: Skt. śrō-ṣ-ati 'to be obedient'
PIE *h₂g̥-es-: Lat. gerō 'to carry', cf. agō < *h₂eg-
PIE *h₂ueg-s- 'to grow': Gr. aέksō, 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. būs 'will be', Lat. ēmerō 'I will have bought' (*ēm-es-), Umbr. ferest 'will bring', OIr. subj. -bē (< *-bwest) 'be'. The Sanskrit future suffix -syā-, as in vak-ṣ-yāti '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-drk-(ē)s-, *dé-drk-s-: Skt. didṛkṣati '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-: ci-kir-ṣ-ati < *kʷṛHs- to the Skt. root kṛ '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. plēthō '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. fā-c-iō ‘to do’ (fā- < dḥh₁-, the root of Gr. ti-thē-mi), Phryg. ad-dakēt ‘he (shall?) do’ (da- < dḥeh₁-); Gr. olēkō (‘to destroy’), cf. aor. ól-e-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 *lei-kʷ-, pres. *li-n-kʷ; there is an ablaut form with *e before the last consonant: *li-n-ékʷ-. Verb forms of which the final consonant was an occlusive or s have usually been thematized. They only remained thematic 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. riṇākti, OPr. po-līnka, Lat. linquō
PIE *ku-n-ēs-ti ‘to kiss’; Gr. kunēō, cf. OHG kussen, Hitt. 3 pl. kuwassanzi
PIE *dm-n-ēh₂-ti ‘to subdue’: Gr. dámnēsi, OIr. damnāid
PIE *h₂-r-n-ēu-ti ‘to set into motion’: Skt. ṛṇōti, Hitt. ārnuzi, Gr. órnūmi

From verbs ending in *-u a novel suffix *-neu- was abstracted (Gr. deik-nū-mi, cf. Lat. dicō < *deik̚-). In the same way the suffix *-neh₂- > -nā- arose from roots ending in *-h₂. If the suffix *-nh₂- was thematized, the laryngeal disappeared (Gr. kāmnō ‘to become tired’ < *km-n-h₂-) or a sequence -an- developed (Gr. khand-ān-ō ‘to pick up’ from *gʰnd-η-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 them 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)

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*Singul*ar. It is easy to see that the PIE forms were: primary 1 *-mi, 2 *-si, 3 *-ti, secondary 1 *-m, 2 *-s, 3 *-t. Hitt. -zi < -ti. Slav. -si is a contamination of *-si > -sᵣ 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 -mᵣ < *-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 *-thₑ; sec. *-te*.

*Dual.* All dual endings are dealt with together in Section 18.6
b. The Thematic Endings

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<tr>
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<th>Lith.</th>
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<tr>
<td>*-o</td>
<td>(-anti)</td>
<td>-ōṭe</td>
<td>-a</td>
<td>-ōusi</td>
<td>-unt</td>
<td>berait</td>
<td>-and</td>
</tr>
<tr>
<td>SECONDARY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*-om</td>
<td>(-ām)</td>
<td>-ṿ</td>
<td>-on</td>
<td>-a(u)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*-es</td>
<td>(-ās)</td>
<td>-e</td>
<td>-es</td>
<td>-(ai)s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*-et</td>
<td>(-āt)</td>
<td>-e</td>
<td>-(ai)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*-omoḷe</td>
<td>(-āma)</td>
<td>-ōṃ</td>
<td>-ōmen/s</td>
<td>-(ai)ma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*-ete</td>
<td>(-āta)</td>
<td>-ēte</td>
<td>-(ai)p</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*-ont</td>
<td>(-ān)</td>
<td>-q̣</td>
<td>-on</td>
<td>-(ai)na</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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 *-û* according to Leskien’s law, see 11.9.4). — 2 sg. Compared with Lithuanian (-i < *-īe*), Greek has added -s (from the thematic 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 -ṭe. 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 i-. — 1 pl. For the ending *-mom*, see the thematic inflection. The preceding vowel was *-o-*, which Slavic replaced with *-e-. Indo-Iranian -a- confirms the *-o-* (according to Brugmann’s law). — 2 pl. has *-e-*, probably with *-th₁e-. — 3 pl. The classical reconstruction is *-onti* (Gr. -ousi l-ōsil < *-onsi < *-onti). But the ending *-nti* belongs to the thematic 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 -e̱nc < *-onti*, but older forms have -e < *-o*; Tocharian B has -enm 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 thematic 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 atematic endings, either of the mi-class or of the hi-class (see 18.4.2).

18.2.3 Inflection

The atematic 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:

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>Hitt.</th>
<th>Gr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*h₁-éi -mi ‘I go’</td>
<td>é -mi</td>
<td>epmi</td>
<td>eими</td>
</tr>
<tr>
<td>-si</td>
<td>-ṣi</td>
<td>epsi</td>
<td>eĩ</td>
</tr>
<tr>
<td>-ti</td>
<td>-ti</td>
<td>epzi</td>
<td>eası</td>
</tr>
<tr>
<td>*h₁-i -mès</td>
<td>i -más(i)</td>
<td>appueni</td>
<td>imen</td>
</tr>
<tr>
<td>-th₁-é</td>
<td>-thá</td>
<td>apteni</td>
<td>ḫte</td>
</tr>
<tr>
<td>-énti</td>
<td>y -ánti</td>
<td>appanzí</td>
<td>iāsí</td>
</tr>
</tbody>
</table>

Next to epp- ‘to take’ < *h₁ep-, Hittite has the zero grade app- < *h₁p- in the plural forms. Gr. 3 pl. -ās 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:

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>Gr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>123 sg.</td>
<td>*bhé-bh₂er-mi, -si, -ti</td>
<td>bh₂-bhar-mi, -ṣi, -ti</td>
</tr>
<tr>
<td>12 pl.</td>
<td>*bh₂i-bh₂r-més, -th₁-é</td>
<td>bh₂-bh₂r-más, -thá</td>
</tr>
<tr>
<td>3 pl.</td>
<td>*bh₂é-bh₂r-nti</td>
<td>bh₂-bh₂r-nti</td>
</tr>
</tbody>
</table>

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. *spekiomom
b. *bʰéh₂ti
c. *h₁ésish₁ent
d. *monéieh₁i
e. *kh₂p-s-th₁é
f. *h₁élink₉m
g. *umh₁énti
h. *ṅh₂skēte
i. *didh₂més
j. *uérurg-ιοντ

Exercise 55
Reconstruct the required verb forms to the following roots, here in given in the zero grade:

a. *uğ’h- ‘convey’ causative pres. 3sg. impf.
b. *klh₂- ‘break’ nasal pres. 3pl. pres.
c. *likʷ ‘to stay behind’ s-pres. 2sg. pres.
d. *gʷm- ‘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 *-eh₁- 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.

*h₁é-dʰeh₁-t ‘to put’: Skt. á-dhā-t, Arm. ed, Gr. 1 pl. é-the-men
*h₁é-kleu-t ‘to hear’: Skt. áśrot, Gr. imp. klū-thi (long ū is analogical)
*h₁é-pleh₁-t, *plh₁- ‘to fill’: Skt. áprāt, imp. pūr-dhi, Gr. plē-to
*h₁é-drk‘ to see’: Skt. ádṛśma
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.

\[ *h_1^e\text{-u}d^\text{h}-\text{et} \text{ 'to see': Skt. áv\text{id}at, Gr. ei\text{de} } \]
\[ *h_1^e\text{-h}_1^\text{lud}^h\text{-et} \text{ 'to come': Gr. él\text{uth}e, OIr. l\text{uid} } \]

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. ákar-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 (*dēik- > *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.

\[ *h_1^e\text{-u}d^\text{h}-\text{s} \text{ 'to carry': Skt. áv\text{aks\text{"a}}-am, OCS věš-\text{\textdaggerhead}, Lat. věx-\text{\textdaggerhead} } \]
\[ *h_1^e\text{-dēi}k^\text{h}-\text{s} \text{ 'to indicate': Av. dāi\text{ś}, Gr. é-deiks-a, Lat. dīx-\text{\textdaggerhead} } \]

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):

<table>
<thead>
<tr>
<th></th>
<th>Skt.</th>
<th>Gr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*h₁e-steh₂-m</td>
<td>ákar-am</td>
<td>ásth₂-m</td>
</tr>
<tr>
<td>-s</td>
<td>ákar</td>
<td>-s</td>
</tr>
<tr>
<td>-t</td>
<td>ákar</td>
<td>-t</td>
</tr>
<tr>
<td>*h₁e-sth₂-me</td>
<td>-ma</td>
<td>-ma</td>
</tr>
<tr>
<td>-te</td>
<td>-ta</td>
<td>-ta</td>
</tr>
<tr>
<td>-nt</td>
<td>ásth-ur</td>
<td>éb(ēs)an</td>
</tr>
<tr>
<td>*sth₂-ent</td>
<td>ákr-an</td>
<td></td>
</tr>
</tbody>
</table>

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 ebēn the full grade has been generalized, but the zero grade appears
from ebān (< *h₁é-gʷh₂-(e)nt) and from 3 du. bātēn < *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’, délα- ‘to do’):

<table>
<thead>
<tr>
<th>Skt.</th>
<th>Gr.</th>
<th>OCS</th>
<th>OCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>*-s-m</td>
<td>ājaišam</td>
<td>édeiksa</td>
<td>vēṣā</td>
</tr>
<tr>
<td>-s</td>
<td>ājais</td>
<td>édeiksa</td>
<td>(vedē)</td>
</tr>
<tr>
<td>-t</td>
<td>ājais</td>
<td>édeikse</td>
<td>(vedē)</td>
</tr>
<tr>
<td>-me</td>
<td>ājaišma</td>
<td>edeiksmen</td>
<td>vēsomṛ</td>
</tr>
<tr>
<td>-te</td>
<td>ājaiṣta</td>
<td>edeikśate</td>
<td>vēste</td>
</tr>
<tr>
<td>-nt</td>
<td>ājaiśur</td>
<td>édeiksan</td>
<td>vēṣe</td>
</tr>
</tbody>
</table>

Sanskrit. In 2 and 3 sg. the endings -s and -t were lost by regular sound law. At a later
stage, the endings -is, -it (< *-H-s, *-H-t) were adopted from roots ending in laryngeal.
3 pl. -ur is the ending of the perfect. Avestan still has -at < *-nṭ.

Greek. 1 sg. -a < -m. 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 -nṭ gave -a[t] > -a, to which -n (from *-nt after
a vowel) was added.

Slavic. 1 sg. -o < -om (thematic), délaxoṛ 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). délα < -ās, -āst. 1 pl. also has acquired the thematic vowel -o-. 3 pl. -ė < *-nṭ.

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. *deiṅ, *deiṅst) 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-h₂e ‘I know’. Latin often has no reduplication, Germanic seldom.

The PIE perfect tense had an accented *-ô- 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 *-h₂e. The laryngeal is still visible in Hittite h. Luwian has -ha; Hitt. -un comes from elsewhere. *-th₂e also explains the aspiration of Sanskrit (*uoid-ta > Gr. *oista; the th of Greek is unclear). 1 sg. *-h₂e versus 3 sg. *-e is confirmed by Skt. jagáma : jagáma; in 3 sg. *-gmê the o became ã according to Brugmann’s law, whereas in 1 sg. *-gmômah₂e 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.

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>OCS</th>
<th>Toch. B</th>
<th>Hitt.</th>
<th>Hitt</th>
</tr>
</thead>
<tbody>
<tr>
<td>*uoid-h₂e</td>
<td>vêda</td>
<td>vêdê</td>
<td>kautâwa</td>
<td>(ár-hhi)</td>
<td>ár-hhun</td>
</tr>
<tr>
<td>-th₂e</td>
<td>véttha</td>
<td>vêsi</td>
<td>kautâsta</td>
<td>(-tti)</td>
<td>-tta</td>
</tr>
<tr>
<td>-e</td>
<td>vêda</td>
<td>vêsto</td>
<td>kauta</td>
<td>(-i)</td>
<td>-s</td>
</tr>
<tr>
<td>*uíd-mé</td>
<td>vidmá</td>
<td>vêmô</td>
<td>kautâm(o)</td>
<td>(ar-ueni)</td>
<td>ar-uen</td>
</tr>
<tr>
<td>-(h₂)é</td>
<td>vidá</td>
<td>vêste</td>
<td>kautâs(o)</td>
<td>(-teni)</td>
<td>-ten</td>
</tr>
<tr>
<td>-r/ér</td>
<td>vidûr</td>
<td>vêdêr</td>
<td>kautâre</td>
<td>(-anzi)</td>
<td>-er</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gr.</th>
<th>Lat.</th>
<th>OIr.</th>
<th>Goth.</th>
</tr>
</thead>
<tbody>
<tr>
<td>oîda</td>
<td>vidi</td>
<td>-cechan</td>
<td>wait</td>
</tr>
<tr>
<td>oîsth</td>
<td>vidistí</td>
<td>-cechan</td>
<td>wait</td>
</tr>
<tr>
<td>oîde</td>
<td>vidit</td>
<td>-cechain</td>
<td>wait</td>
</tr>
<tr>
<td>ídmen</td>
<td>vidimus</td>
<td>-cechnamar</td>
<td>witum</td>
</tr>
<tr>
<td>íste</td>
<td>vidistis</td>
<td>-cechnid</td>
<td>wituþ</td>
</tr>
<tr>
<td>ísâsi</td>
<td>vidère, -ërunt</td>
<td>-cechnatar</td>
<td>wituñ</td>
</tr>
</tbody>
</table>

Plural. 2 pl. was *-e judging by Sanskrit. Everywhere else the form is identical to that of the present (*-te), thus *-e (*-h₂e?) must be old. — The 3 pl. is more problematic.
The forms with -t- (Gr. -āsi < *-a-nṭi) 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. fēcere). Skt. -ur reflects *-ṛs, which is confirmed by OAv. cikōtṛr̥s; the origin of the -s is unclear. Avestan has -arə elsewhere (viḍarə), which is based on *-r. Lat. -ēre (clearly < *-ēr-i), -ērunt (a contamination of -ēre and -erunt, of which the explanation is unclear) point toward *-ēr. Av. middle āhār̥ē ‘they sit’ (< *ās-ār-ai) may also point to *-ēr. In this way we arrive at *-r 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-ēr ‘they see’), or in static as opposed to mobile inflection (see Section 18.7).

OCS has vēdē < *-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. -cechán 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 < *-ηť; 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/O 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 (ā-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. \(^*gi^2-g^i^2eh_1\) ‘to come’

c. \(^*gh^rs-\) ‘to get stiff’

d. \(^*d^euk-s/\)\(^*deuk-s\) ‘to pull’

e. \(^*k^w^elh_1-d^h\) ‘to appear’

f. \(^*iem/\)\(^*im\) ‘to stretch’

g. \(^*strnéh_3/\)\(^*strnh_3\) ‘to spread’ (\(\sqrt{\ast}^*st^r^h_3\))

h. \(^*g^h^nd/\)\(^*g^h^nd\) ‘to catch’ (\(\sqrt{\ast}^*g^h^ed\))

i. \(^*dol^h-\) ‘to split’

j. \(^*b^he-b^h^oih_2/\)\(^*b^he-b^h^ih_2\) ‘to fear’

k. \(^*mesg-e\) ‘to immerse’

Exercise 57
Provide the required verb stems to the given roots:

a. \(^*leis\) perfect

b. \(^*g^neh_3\) s-aorist

c. \(^*ies\) reduplicated pres.

d. \(^*kleu\) nasal pres.

e. \(^*dek\) s-present

f. \(^*h^1mel^g\) athematic pres.

g. \(^*h^1merd\) causative

h. \(^*b^heu^d^h\) 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. śāy-e, Gr. keī-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. gi-gn-o-mai ‘to be born’

See also Section 18.10.

18.5.2 Personal endings

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-e</td>
<td>-hha(ha)(ri)</td>
<td>-ār/-mar</td>
<td>-mai</td>
<td>-or</td>
<td>-ur</td>
<td>-da</td>
</tr>
<tr>
<td>-se</td>
<td>-tt(a)(ri)</td>
<td>-tār/-tar</td>
<td>-sai</td>
<td>-ris</td>
<td>-ther</td>
<td>-za</td>
</tr>
<tr>
<td>-te, -e</td>
<td>-(t)ta(r)</td>
<td>-tār</td>
<td>-tai, -toi</td>
<td>-tur</td>
<td>-thir</td>
<td>-da</td>
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<tr>
<td>-mahe</td>
<td>-wasta(r)</td>
<td>-mtār</td>
<td>-metha</td>
<td>-mur</td>
<td>-mir</td>
<td>-nda</td>
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<tr>
<td>-dhve</td>
<td>-ttuma(r)</td>
<td>-cār/-tār</td>
<td>-sitha</td>
<td>-minī</td>
<td>-the</td>
<td>-nda</td>
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<td>-nte, -re</td>
<td>-anta(r)</td>
<td>-ntār</td>
<td>-ntai</td>
<td>-ntur</td>
<td>-tir</td>
<td>-nda</td>
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<tr>
<td>-i</td>
<td>-hha(ha)t(i)</td>
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<td>-so</td>
<td>-re</td>
<td>-the</td>
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<tr>
<td>-ta, -a</td>
<td>-(tt)at(i)</td>
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<td>-to</td>
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<tr>
<td>-mahi</td>
<td>-wastat(i)</td>
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<td>(-metha)</td>
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<tr>
<td>-dhvam</td>
<td>-ttumat(i)</td>
<td>-cl/-t</td>
<td>(-sthe)</td>
<td>-d</td>
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<tr>
<td>-nta,</td>
<td>-antat(i)</td>
<td>-nt/-nte</td>
<td>-nto</td>
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<td>-ra(n/m)</td>
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<tr>
<td>PIE intransitive</td>
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<td>transitive</td>
<td>*-mh₁</td>
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<td>*-th₂o</td>
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<td>*-sth₂o</td>
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<tr>
<td>*-o</td>
<td></td>
<td>*-to</td>
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<tr>
<td>*-med²h₂</td>
<td></td>
<td><em>-med⁰h₂ (</em>-mesd⁰h₂)</td>
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<td>*-dʰue</td>
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<td>*-tdʰue</td>
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<tr>
<td>*-ro</td>
<td></td>
<td>*-ntro</td>
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</tbody>
</table>

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 *h₂. Skt. -i indicates that the ending consisted of the single laryngeal. Gr. *-mai and *-mām can then be explained as reflecting *-maH < *-mh₂ (+ 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 *-th₂o, probably *-th₂o. 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 *-medʰh₂. But Greek also has -mestha, which seems similar to Hitt. -wasta (for the w- cf. act. -weni). — 2 pl. Skt. -dhve, -dhvam points toward *-dʰwa, which must go back to *-dʰue 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. sáy-e, PIE *kéi-o 'he lies') were the oldest type, which served as the basis for middle forms to transitive verbs (Gr. λουίται '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-h₂, *-s-th₂o, etc. The adoption of the primary active form as a basis led to 1 pl. *-mes-dʰh₂-. — 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- > bravi-ti; *bhū- ‘to be’; *kr- ‘to do’; *stu- ‘to praise’; Gr. do- < *dh3- ‘to give’; hépomai ‘to follow’; *deik- ‘to indicate’).

<table>
<thead>
<tr>
<th>Athematic present</th>
<th>Thematic present</th>
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</thead>
<tbody>
<tr>
<td>bruv-é</td>
<td>dido-mai</td>
</tr>
<tr>
<td>bruv-ṣé</td>
<td>-sai</td>
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<tr>
<td>bruv-té</td>
<td>-tai</td>
</tr>
<tr>
<td>bruv-маhe</td>
<td>-metha</td>
</tr>
<tr>
<td>bruv-dhvē</td>
<td>-sthe</td>
</tr>
<tr>
<td>bruv-áte</td>
<td>-ntai</td>
</tr>
<tr>
<td>bháv-é</td>
<td>-ase</td>
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<tr>
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<td>-ate</td>
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<td>bháv-маhe</td>
<td>-āmahe</td>
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<tr>
<td>bháv-áte</td>
<td>-ante</td>
</tr>
<tr>
<td>hép-omai</td>
<td>-ei &lt; -eai</td>
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<tr>
<td>hép-omai</td>
<td>-etai</td>
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<tr>
<td>hép-omai</td>
<td>-ómetha</td>
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<td>-esthe</td>
</tr>
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<td>hép-omai</td>
<td>-ontai</td>
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<td>ábruv-thās</td>
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<td>ábruv-dhvām</td>
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<td>ábruv-dhvām</td>
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<tr>
<td>ábruv-dhvām</td>
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<td>ábruv-nto</td>
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<tr>
<th>Athematic aorist</th>
<th>s-aorist</th>
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<tr>
<td>ákr-i</td>
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<tr>
<td>ákr-thās</td>
<td>-u</td>
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<tr>
<td>ákr-thās</td>
<td>-thās</td>
</tr>
<tr>
<td>ákr-thās</td>
<td>-ō &lt; -ao</td>
</tr>
<tr>
<td>ákr-thās</td>
<td>-ato</td>
</tr>
<tr>
<td>ákr-mahi</td>
<td>-metha</td>
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<tr>
<td>ákr-mahi</td>
<td>-mahī</td>
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<tr>
<td>ákr-dhvām</td>
<td>-sthe</td>
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<tr>
<td>ákr-dhvām</td>
<td>āstodhvām</td>
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<td>ákr-nto</td>
<td>-anto</td>
</tr>
<tr>
<td>ákr-nto</td>
<td>āstodos-nto</td>
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<tr>
<td>ákr-nto</td>
<td>-anto</td>
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</tbody>
</table>

Exercise 58

Reconstruct the PIE preforms of the following Skt. forms:
Skt. áśret 3sg.aor.ind.act., śrāyate 3sg.pres.ind.med., śiśrāya 3sg.pf.ind.act.: to PIE *klei- ‘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.  
*dadmaḏdē* (1 pl. to pres. *dad-/dād-*)
c.  
*māsta* (3 sg. to aor. *man-s-*)
d.  
*mruiiē* (*mluH-ai*, 3 sg. to pres. *mrauu-/mrū-*)
e.  
*vinasti* (3 sg. to pres. *vinad-/vind-*)
f.  
*fra-caraθβe* (< *-δβe*, 2 pl. pres. to *car-a-*)

18.6 The dual

Personal endings:

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<tr>
<td>-ues</td>
<td>-vas</td>
<td>-uuahi</td>
<td>-vē</td>
<td>-va</td>
<td>-</td>
<td>-(o)s</td>
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<tr>
<td>-tHe/os</td>
<td>-thas</td>
<td>?</td>
<td>-ta</td>
<td>-ta</td>
<td>-ton</td>
<td>-ts</td>
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<tr>
<td>-tes</td>
<td>-tas</td>
<td>-tō</td>
<td>-te</td>
<td>-</td>
<td>-/tēn</td>
<td>-ton</td>
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<td></td>
<td>SECONDARY</td>
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<tr>
<td>-ue</td>
<td>-va</td>
<td>-uua</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-u, -wa</td>
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</tr>
<tr>
<td>-tom</td>
<td>-tam</td>
<td>?</td>
<td>-ton</td>
<td>-ton</td>
<td>-uts</td>
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<tr>
<td>-teh₂m</td>
<td>-tām</td>
<td>-tām</td>
<td>-</td>
<td>-enast-</td>
<td>-</td>
<td>-tēn</td>
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</tr>
</tbody>
</table>

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:
<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>ath.</th>
<th>them.</th>
<th>Hitt.</th>
<th>Gr.</th>
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<tbody>
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<td><strong>PRIMARY</strong></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>*-ued*h₂</td>
<td>-vahe</td>
<td>-vahe</td>
<td>(-wasta(ri))</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><em>(e)Hth₁-?</em></td>
<td>-āthe</td>
<td>-ithe</td>
<td>-sthon</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(e)Hth₂??</em></td>
<td>-āte</td>
<td>-ite</td>
<td>-sthon</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SECONDARY</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-vahi</td>
<td>-vahi</td>
<td>(-wastat(i))</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-āthām</td>
<td>-ithām</td>
<td>-sthon</td>
<td></td>
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<tr>
<td>-ātām</td>
<td>-itām</td>
<td>-sthēn</td>
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</tbody>
</table>

The pattern Skt. \(v-, \, tḥ-, \, t-\) 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\*h₂ (OAv. -uuaidi; cf. 1 pl. med. -mahi, Gr. -metha), Hitt. 1 pl. -wasta must go back to *-uosd\*h₂. — 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**
  - émi
  - brāvī-ti

- **ind. pl. zero grade**
  - y-ánti
  - bruv-ánti

- **middle zero grade**
  - brū-té

<table>
<thead>
<tr>
<th>normal</th>
<th>sg.</th>
<th>CēC-mi</th>
<th>static</th>
<th>CēC-mi</th>
</tr>
</thead>
<tbody>
<tr>
<td>(mobile)</td>
<td>pl.</td>
<td>CC-énti</td>
<td>Cēc-nti</td>
<td></td>
</tr>
<tr>
<td></td>
<td>med.</td>
<td>CC-tó</td>
<td>CēC-to</td>
<td></td>
</tr>
</tbody>
</table>

In abstract terms:

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. kei-tai ‘he lies’ < *kéi-o.

Perhaps some perfects with a long vowel belong here too: Gr. gégône ‘he made himself heard’, eiôtha < *se-suôdô ‘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, ê-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. indrasya nû viryâñi 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:
má na, indra, párā vṛṇak (inj.) 'Do not forsake us, Indra.' In Greek the injunctive forms are completely equal to the indicative forms (bē = ēbē '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:

<table>
<thead>
<tr>
<th>ATHEMATIC STEMS</th>
<th>THEMATIC STEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>*-oH</td>
<td>Skt. ăs-ă(ni)</td>
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<tr>
<td>*-eh₉</td>
<td>as(i)</td>
</tr>
<tr>
<td>*-e</td>
<td>-at(i)</td>
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<tr>
<td>*-omom</td>
<td>-āma</td>
</tr>
<tr>
<td>*-eth₁e</td>
<td>-atha</td>
</tr>
<tr>
<td>*-o</td>
<td>-an</td>
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</tbody>
</table>

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, *-h₁,i, zero, *-mom, *-th₁,e, 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, xšaia = /xšayaâ/, hacāntē = /hacaantail/.

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- < *h₁,es- as opposed to *h₁,es-/*h₁,s- in the indicative). This is most apparent in the middle, where Sanskrit has zero grade in all indicative forms, for example brū-tē, but sub. brāv-a-te (*mloH-/*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. vār-a-t, opt. middle vur-i-ta (*uēH- 'to want').

Both Sanskrit, where, for example, karat(i) is the subjunctive to (pres.) kṛṇōmi, 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 *-ieh₁-/*-ih₁-, with secondary endings. In the thematic inflection we find -oi- < *-o-ih₁-.

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>Gr.</th>
<th>Lat.</th>
<th>Goth.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*h₁s-ieh₁-m</td>
<td>s-yā-m</td>
<td>eiēn</td>
<td>siēm, sim</td>
<td>ber-jau</td>
</tr>
<tr>
<td>-s</td>
<td>-s</td>
<td>-s</td>
<td>siēs, sīs</td>
<td>-ei</td>
</tr>
<tr>
<td>-t</td>
<td>-t</td>
<td>-</td>
<td>sīt, sit</td>
<td>-i</td>
</tr>
<tr>
<td>*h₁s-ih₁-mé</td>
<td>-ma</td>
<td>eīmen</td>
<td>simus</td>
<td>-eima</td>
</tr>
<tr>
<td>-tē</td>
<td>-ta</td>
<td>-te</td>
<td>sītis</td>
<td>-eīp</td>
</tr>
<tr>
<td>*h₁és-ih₁-nt</td>
<td>s-yūr</td>
<td>-en</td>
<td>sint, sient</td>
<td>-eina</td>
</tr>
</tbody>
</table>

Sanskrit has generalized -yā, and has -ur instead of *-at < *-nt. Old Latin still has -iē-. Only the verb ‘to be’ still preserves the old optative paradigm in Latin. Gothic generalized -i- < *-ih₁-. 1 sg. -au reflects the thematic form *-oih₁m > *-ajun > -au. OCS has ē < *oi in 2 pl. Ḟhpētē, 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. deyām from the root dā- ‘to give’. The -e-, PIIR. *-ai-, comes from *deh₁-ih₁-nt > *daHi-; in the 1 pl., this yielded *daīma > *daima > *demā. This was then remade into deyāma, by which means the stem deyā- was formed.

Reduplicated optatives had the zero grade of the suffix everywhere. Av. daidīt < *dē-t- ih₁-nt. There are also traces of static inflection elsewhere. OAv. varṣimā < *uerg-ih₁-me ‘may we work’; Lat. velimus, Goth. wileima ‘(may) we wish to’ < *uēlH-ih₁-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 < -ih₁-nt. Normally, Greek has *sai-mi etc., with -a- from the indicative.
Middle. We find the following endings:

<table>
<thead>
<tr>
<th>PIE</th>
<th>Skt.</th>
<th>Gr.</th>
<th>Goth.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>ATHERMATIC</strong></td>
<td></td>
</tr>
<tr>
<td>*-ih₁-h₂</td>
<td>bruv-īyā</td>
<td>theimēn</td>
<td></td>
</tr>
<tr>
<td>-th₂-ō</td>
<td>-thās</td>
<td>theiō</td>
<td></td>
</tr>
<tr>
<td>-ō</td>
<td>-ītā</td>
<td>theiō</td>
<td></td>
</tr>
<tr>
<td>-médʰh₂</td>
<td>-imāhi</td>
<td>theimētha</td>
<td></td>
</tr>
<tr>
<td>-dʰue</td>
<td>-idhvām</td>
<td>theisthe</td>
<td></td>
</tr>
<tr>
<td>-ró</td>
<td>-irán</td>
<td>theinto</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>THEMATICAL</strong></td>
<td></td>
</tr>
<tr>
<td>*-oih₁-h₂</td>
<td>bhār-eya</td>
<td>pher-oimēn</td>
<td>bair-aidau</td>
</tr>
<tr>
<td>-th₂-o</td>
<td>-ethās</td>
<td>-oio</td>
<td>-aizau</td>
</tr>
<tr>
<td>-ō</td>
<td>-eta</td>
<td>-oito</td>
<td>-aidau</td>
</tr>
<tr>
<td>-médʰh₂</td>
<td>-emahi</td>
<td>-oimetha</td>
<td>(-aindau)</td>
</tr>
<tr>
<td>-dʰue</td>
<td>-edhvam</td>
<td>-oisthe</td>
<td>(-aindau)</td>
</tr>
<tr>
<td>-ró</td>
<td>-eran</td>
<td>-ointo</td>
<td>(-aindau)</td>
</tr>
</tbody>
</table>

According to Skt. 3 pl. -ran the optative had the intransitive middle endings. 3 sg. *-ih₂-ō > Skt. *-iya was replaced by -i + 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).

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<tr>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>ACTIVE ATHERMATIC</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>i- hí</td>
<td>i-tát</td>
<td>ep</td>
<td>i-thi</td>
<td>ī</td>
<td>itō</td>
</tr>
<tr>
<td>3.</td>
<td>é-tu</td>
<td>i-tát</td>
<td>epdu</td>
<td>i-tō</td>
<td>ėte</td>
<td>itōte</td>
</tr>
<tr>
<td>2.</td>
<td>i- tá</td>
<td>i-tát</td>
<td>epent</td>
<td>i-te</td>
<td>īte</td>
<td>itōte</td>
</tr>
<tr>
<td>3.</td>
<td>y-ántu</td>
<td>appandu</td>
<td>i-óntōn</td>
<td>euntō</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>ACTIVE THEMATIC</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>bhār-a</td>
<td>-atát</td>
<td>phér-e</td>
<td>age</td>
<td>agitō</td>
<td>bair</td>
</tr>
<tr>
<td>3.</td>
<td>-atu</td>
<td>-atát</td>
<td>-ētō</td>
<td>-agito</td>
<td>bair-adau</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>-ata</td>
<td>-ete</td>
<td>agite</td>
<td>agitōte</td>
<td>-īp</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>-antu</td>
<td>-óntōn</td>
<td>aguntō</td>
<td>-andau</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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. i < *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:

<table>
<thead>
<tr>
<th>Skt</th>
<th>Hitt.</th>
<th>Gr.</th>
<th>Lat.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>tr.</td>
<td>intr.</td>
<td>II</td>
</tr>
<tr>
<td>-sva</td>
<td>-sva</td>
<td></td>
<td>-ha(∉)</td>
</tr>
<tr>
<td>-tām</td>
<td>-tām</td>
<td></td>
<td>-tām</td>
</tr>
<tr>
<td>-dhva(m)</td>
<td>-dhva(m)</td>
<td></td>
<td>-dhva(m)</td>
</tr>
<tr>
<td>-ntām</td>
<td>-ntām</td>
<td></td>
<td>-ntām</td>
</tr>
</tbody>
</table>

2 sg. Skt. -sva is unknown elsewhere, and is thus old. (One would expect *-sth₂,o, intrans. *-th₂,o, *-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. *gʰwʰn-énti
b. *bʰugʰ-ᵈʰi
f. *h₁éi-omom
g. *kés-ih₁nt
e. *mi-mn-ués
f. *str-n-h₁-té
h. *h₁m-s-iéh₁-m
i. *bʰudʰ-eh₁-tu
j. *h₂e-h₂og-e

Exercise 61
Form the required verb forms to the given roots:

b. *pelh₂- ‘to approach’: nasal pres. 1sg.inj.act.
c. *per- ‘to cross’: o-grade caus.pres. 2pl.opt.act.
d. *kléu- ‘to hear’: root aor. 3pl.inj.act.
e. *h₁ueh₁- ‘to blow’: subj. 3sg.act.
f. *de/i-dk- ‘to receive’: redupl.pres. 3sg.opt.act.
g. *demh₂- ‘to tame’: nasal pres. 3sg.imptv.act.
h. *legʰ- ‘to lie’: intrans. middle (stative) 3sg.ind.
i. *sekʷ- ‘to follow’: thematic trans. middle 3pl.ind.
j. *dʰers- ‘to dare’: perfect 2sg.ind.
k. *ueid- ‘to see’: perfect 3pl.ind.
l. *deh₂- ‘to give’: redupl. pres. 1du.inj.act.

Exercise 62
Reconstruct the PIE preform of the given verb forms:

a. Skt. bhindánti ‘they split’ (root *bʰid-) pres.ind.act.
b. Hitt. kuerzi ‘he cuts’ (root *kwr-) pres.ind.act.
c. Skt. dvisté ‘is hated’ (root *dus-) pres.ind.mid.
d. Av. dāraiiōiś ‘may you hold’ (root *dʰer-) pres.opt.act.
e. Lat. siēs ‘may you be’ (root *h₁s-) pres.opt.act.
f. Gr. ēstēn ‘I stood’ (root *sth₂-) aor.ind.act.
g. Gr. eōike ‘she appears’ (root *uik-) 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 hysterdynamical 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’ (*h₁i-ent-); them. bhárant- ‘carrying’; s-aor. dhák-s-at ‘burning’ < *-s-ṇt
OCS nesy, nesōš- ‘carrying’ < *-ont-į; Lith. nėšąs, -ant-
Hitt. kunan- ‘killed’ from kuen-
Toch. A asānt-, Toch. B ašēnca ‘transporting’ (PIE *h₂eğ-)
Gr. titheis < -ent-s, ión, 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. -āntō < *-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-ván, -us- ‘knowing’
OCS neso, -eš- ‘having carried’ < *-us-į
Lith. lik-ės, -us- ‘having left’ (with transformed nominative *-uents)
Toch. A papraaku, Toch. B peparku ‘having asked’
Gr. eidós ‘knowing’ < *ueid-uōs, feminine *iđuā < *uid-us-iḥ₂
Goth. (only lexicalized, that is to say, made into a substantive) berusjos ‘parents’ < ‘who have carried’

Middle. The suffix *-mh₁no- makes middle participles. This looks like a compound suffix, made from the zero grade of the suffix -h₁en- (Section 13.1.2) after a verbal noun in *-m-. For the forms see Section 10.5. Examples:

Av. baramma- ‘riding (a horse)’
Arm. (lexicalized, e.g.) anasun ‘animal’ = ‘not-speaking’, -un < -omnos
Toch. *klyosmān, Toch. *klyausemāne ‘hearing’
Phryg. *tētikmenos ‘cursed’
Gr. *hēpōmenos ‘following’

Traces in Latin are alumnus ‘pupil’ < *alo-manos, to alō ‘to feed’, and fēmina ‘woman’ = ‘nursing’ (*dheh₁-t- ‘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. syūtā- ‘sewn’, OCS šitɔ < *sjū-tɔ, Lith. siū-tas
Skt. gatā-, Gr. -batós, Lat. (in)-ventus ‘arrived’ < *gʷm-tő-
Lat. tentus ‘stretched’ < *tn-to-
Arm. lu ‘known’ < *klu-tő-
Goth. nāsip ‘saved’ < *tō-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. bhīnā- < *bʰid-nō- ‘split’
Skt. pūrnā- ‘full, filled’, OCS plōnɔ, Lith. pilnas, OIr. lán, Goth. fulls, all from *plh₁-no-, Lat. plēnus (with full grade)

The suffix form *-eno- is found in OCS vlbcenɔ ‘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 *-yo- in the same function: Skt. pakvā- ‘cooked’. With *-lo- were made the past participle passive in Slavic (nes-lō ‘borne’) and Armenian (gereal ‘taken’). A suffix *-mo- is found in Sankrit (bhimā- ‘terrible, frightening’), in Balto-Slavic in the present participle passive (Lith. nēšamas, OCS nesomɔ ‘being carried’, nevidimɔ ‘invisible’), in Albanian (la-m ‘washed’), in Luwian (kisama- ‘combed’) and in Tocharian (A pārknām ‘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. loiōsai ‘to wash’; this form is unchangeable and derived from the aorist stem lou(s)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 *gʰwoni) 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-í ‘to be driven’. From the -tu- suffix we find the accusative in Skt. dátum ‘in order to give’, OCS viděto ‘to see’, OPr. dátun, Lat. (supinum) visum ‘in order to see’; the dative in Skt. dá-tav-e, OPr. da-twei, Lat. (supinum) dictù. Old Irish also has *-tu-, as in léciud ‘to leave’. From a ti-stem the dative is used in Skt. pi-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. -diāi (OAv. jaidiāi ‘to kill’) is perhaps cognate with Umbr. -fi (herifi ‘to wish’), which would point toward *-dʰiōi; 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. *kʰweit- ‘to notice’
d. pres. *kʰwer-/*kʰr- ‘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. ruddhā- ‘obstructed’ (root *ludʰ-)
b. Lat. calumnia ‘slander’ (stem *kHl-u-; the io-stem replaces an o-stem)
c. Skt. ánna- ‘food’ (root *h₁,ed-)
d. Gr. árestos ‘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:

<table>
<thead>
<tr>
<th></th>
<th>pres. ind.</th>
<th>inf. ind.</th>
<th>sub.</th>
<th>opt.</th>
<th>imp.</th>
<th>ATH.</th>
<th>THEM.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRES.</td>
<td>act.</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>med.</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>AOR.</td>
<td>act.</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>med.</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>PF.</td>
<td>act.</td>
<td>+</td>
<td>–</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>–</td>
</tr>
</tbody>
</table>

Now compare the following overview of the verbal endings which we have reconstructed in this book:

<table>
<thead>
<tr>
<th>ATHEMATIC</th>
<th></th>
<th>THEMATIC</th>
<th></th>
<th>STATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2–5</td>
<td>3</td>
<td>4–5</td>
<td>5</td>
</tr>
<tr>
<td>prim.</td>
<td>sec.</td>
<td>trans.</td>
<td>middle</td>
<td>intrans.</td>
</tr>
<tr>
<td>-mi</td>
<td>-m</td>
<td>-mh₂</td>
<td>-omH</td>
<td>-h₂</td>
</tr>
<tr>
<td>-si</td>
<td>-s</td>
<td>-sth₂ο</td>
<td>-eh₁i</td>
<td>-th₂o</td>
</tr>
<tr>
<td>-ti</td>
<td>-t</td>
<td>-to</td>
<td>-es</td>
<td>-th₁e</td>
</tr>
<tr>
<td>-mes</td>
<td>-me</td>
<td>-me(s)dh₂</td>
<td>-omo</td>
<td>-o</td>
</tr>
<tr>
<td>-th₁e</td>
<td>-te</td>
<td>-(t)dh₂u</td>
<td>-eth₁e</td>
<td>-o</td>
</tr>
<tr>
<td>-enti</td>
<td>-ent</td>
<td>-ntro</td>
<td>-ote</td>
<td>-(h₁)e</td>
</tr>
</tbody>
</table>

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 *-eh₁). — 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)dʰh₂ could be the transitive form, while the intransitive form was only *-dʰh₂.

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):

<table>
<thead>
<tr>
<th></th>
<th>imperfective</th>
<th>perfective</th>
<th>transitive middle</th>
<th>optative</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUBJECTIVE</td>
<td>ath. pres.</td>
<td>ath. aor.</td>
<td>ath.</td>
<td>ath.</td>
</tr>
<tr>
<td></td>
<td>1 *-mi</td>
<td>2 *-m</td>
<td>2–5 *-mh₂</td>
<td>*-ih₁-m</td>
</tr>
<tr>
<td>OBJECTIVE</td>
<td>them. pres.</td>
<td>them. aor.</td>
<td>them.</td>
<td>them.</td>
</tr>
<tr>
<td></td>
<td>3 *-oH</td>
<td>4 *-om</td>
<td>4–5 *-omh₂</td>
<td>*-oh₁-m</td>
</tr>
<tr>
<td>STATIVE</td>
<td>intr. middle</td>
<td>perf.</td>
<td>–</td>
<td>?</td>
</tr>
<tr>
<td></td>
<td>5 *-h₂</td>
<td>6 *-h₂e</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th></th>
<th>subject</th>
<th>object</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATHEMATIC</td>
<td>transitive</td>
<td>ergative</td>
</tr>
<tr>
<td></td>
<td>intransitive</td>
<td>absolutive</td>
</tr>
<tr>
<td>STATIVE</td>
<td>(intransitive)</td>
<td>absolutive</td>
</tr>
<tr>
<td>THEMATIC</td>
<td>(transitive)</td>
<td>aorist</td>
</tr>
<tr>
<td></td>
<td>present ‘animate’</td>
<td>dative</td>
</tr>
<tr>
<td></td>
<td>‘inanimate’</td>
<td>instrumental</td>
</tr>
</tbody>
</table>

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. cinōti ‘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’)*

<table>
<thead>
<tr>
<th>Present Active</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ind.</strong></td>
<td>ci-nó-mi</td>
</tr>
<tr>
<td><strong>Pres.</strong></td>
<td>-ṣi</td>
</tr>
<tr>
<td></td>
<td>-ti</td>
</tr>
<tr>
<td></td>
<td>-n-má</td>
</tr>
<tr>
<td><strong>Sub.</strong></td>
<td>ci-náv-á(ni)</td>
</tr>
<tr>
<td></td>
<td>-a-s</td>
</tr>
<tr>
<td></td>
<td>-t</td>
</tr>
<tr>
<td></td>
<td>-a-ma</td>
</tr>
<tr>
<td></td>
<td>-a-tha</td>
</tr>
<tr>
<td></td>
<td>-n</td>
</tr>
<tr>
<td><strong>Ptc.</strong></td>
<td>ci-nv-ánt-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Present Middle</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ind.</strong></td>
<td>ci-nv-é</td>
</tr>
<tr>
<td><strong>Pres.</strong></td>
<td>-nu-ṣé</td>
</tr>
<tr>
<td></td>
<td>-n-máhe</td>
</tr>
<tr>
<td></td>
<td>-n-máhe</td>
</tr>
<tr>
<td></td>
<td>-n-máhe</td>
</tr>
<tr>
<td><strong>Sub.</strong></td>
<td>ci-náv-ai</td>
</tr>
<tr>
<td></td>
<td>-a-se</td>
</tr>
<tr>
<td></td>
<td>-a-te</td>
</tr>
<tr>
<td></td>
<td>-a-mahai</td>
</tr>
<tr>
<td></td>
<td>-a-dhve</td>
</tr>
<tr>
<td></td>
<td>-a-nța</td>
</tr>
<tr>
<td><strong>Ptc.</strong></td>
<td>ci-nv-áná</td>
</tr>
</tbody>
</table>
### PROTO-INDO-EUROPEAN

#### PRESENT ACTIVE

<table>
<thead>
<tr>
<th>ind.</th>
<th>*kʷi-néu-mi</th>
<th>inj.</th>
<th>*kʷi-néu-m</th>
<th>*kʷi-néu-m</th>
</tr>
</thead>
<tbody>
<tr>
<td>pres.</td>
<td>-si</td>
<td>-s</td>
<td>-s</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-ti</td>
<td>-t</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-nu-més</td>
<td>-nu-mé</td>
<td>-nu-mé</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-th₁é</td>
<td>-té</td>
<td>-té</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-énti</td>
<td>-(e)nt</td>
<td>-ént</td>
<td></td>
</tr>
<tr>
<td>sub.</td>
<td>*kʷéi-OH</td>
<td>opt.</td>
<td>*kʷi-nu-iéh₁-m</td>
<td>imp. I</td>
</tr>
<tr>
<td></td>
<td>-eh₁,i</td>
<td>-s</td>
<td>*kʷi-nú(-dʰi)</td>
<td>-tód</td>
</tr>
<tr>
<td></td>
<td>-e</td>
<td>-t</td>
<td>-néu-tu</td>
<td>-tód</td>
</tr>
<tr>
<td></td>
<td>-omom</td>
<td>-ih₁mé</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-eth₁,e</td>
<td>-té</td>
<td>-nu-té</td>
<td>-tód</td>
</tr>
<tr>
<td></td>
<td>-o</td>
<td>-néu-ih₁nt</td>
<td>-éntu</td>
<td></td>
</tr>
<tr>
<td>ptc.</td>
<td>*kʷi-nu-ént-</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### PRESENT MIDDLE

<table>
<thead>
<tr>
<th>ind.</th>
<th>*kʷi-nu-mh₂</th>
<th>inj.</th>
<th>*h₁é-kʷi-nu-mh₂</th>
<th>*kʷi-nu-mh₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>pres.</td>
<td>-sth₂ó</td>
<td>-sth₂o</td>
<td>etc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-tó</td>
<td>-to</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-me(s)dʰh₂</td>
<td>-me(s)dʰh₂</td>
<td>= ind.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-dʰue</td>
<td>-dʰue</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-ntro</td>
<td>-ntro</td>
<td></td>
<td></td>
</tr>
<tr>
<td>opt.</td>
<td>*kʷi-nu-ih₁-h₂</td>
<td>imp. I</td>
<td>II</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-th₂ó</td>
<td>-kʷi-nu-sué</td>
<td>-tód</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-ó</td>
<td>-tó?</td>
<td>-tód</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-mé(s)dʰh₂</td>
<td>-dʰue</td>
<td>-tdʰue</td>
<td>-tód</td>
</tr>
<tr>
<td></td>
<td>-dʰué</td>
<td>-ró</td>
<td>-ntó?</td>
<td></td>
</tr>
<tr>
<td>ptc.</td>
<td>*kʷi-nu-mh₁nó-</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**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.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>gáčchámi</td>
<td>gácchá(ni)</td>
<td>gáccheyam</td>
<td>2sg. gáčchasva</td>
</tr>
<tr>
<td>gáčchasi</td>
<td>gácchás(i)</td>
<td>gáčches</td>
<td>2pl. gáčchadhvam</td>
</tr>
<tr>
<td>gáčchati</td>
<td>gáccháti</td>
<td>gáčchet</td>
<td></td>
</tr>
<tr>
<td>gáčchámas(i)</td>
<td>gáccháma</td>
<td>gáčchema</td>
<td></td>
</tr>
<tr>
<td>gáčchatha</td>
<td>gácchátha</td>
<td>gáčcheta</td>
<td></td>
</tr>
<tr>
<td>gáčchanti</td>
<td>gáčcháni</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>E. Aor.ind.act.</th>
<th>F. Aor.subj.act.</th>
<th>G. Perf.ind.act.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ágamam</td>
<td>gámáni</td>
<td>jagáma</td>
</tr>
<tr>
<td>ágan</td>
<td>gámas</td>
<td>jagántha</td>
</tr>
<tr>
<td>ágan</td>
<td>gámat</td>
<td>jagáma</td>
</tr>
<tr>
<td>áganma</td>
<td>gámáma</td>
<td>jaganmá</td>
</tr>
<tr>
<td>áganta</td>
<td>gámatha</td>
<td>jagmá</td>
</tr>
<tr>
<td>ágman</td>
<td>gáman</td>
<td>jagmúr</td>
</tr>
</tbody>
</table>

**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 since 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) Akvāsās ā vavakat: krudhi avai, kard aghnutai vividvant-svas: manus patis varnām avisāms karnauti svabhjams gharraṁ 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) täu’soi tuel’ēne nērams te uēi’d, tom ‘g’rēu’m uogom uēontology, tom m’gešt borom, tom dğmenn rok’u berontm.
(2) te uēuk täu’soi tekomus, sēdgo hmoi kērd sterm ui’denti tek’uns te’gontm.
(3) te uēuknd’ikues: kludi täu’ei, sēdgo nsni kērd’ui’denti, snēr potis tä’uiom sulžesm subi g’ermom uesti k’rnueti, tä’uiom k’e sulžes rnesti.
(4) to’d kekluus täu’soi plešnom te bēug.

Notes:

a. ‘Horse’ is reconstructed as an u-stem *teku- on account of Hittite ekku- < *teku-.

b. Final cluster simplification has already been applied: nērams < earlier *nēst, uēuk < *uēukt, bēug < *bēugd

c. iku’es “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

Exercise 2

Exercise 3

Exercise 4

Exercise 5

Exercise 6

Exercise 7
a. PIE *d > PGm. *t = E. t; > OHG zz > NHG ss between vowels
b. PIE *t > PGm. *p- (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 *g > PGm. *k (> kch in southern HG); PIE *t > PGm. *d (Verner’s Law)
e. PIE *d > PGm. *t = E. t; > OHG z-; PIE *gʰ > PGm. *g = E. g, NHG ng [ŋ]
f. PIE *k > 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. *d̅k̅
Exercise 9  
a. *t̂k̂, b. *pekt-, *pkt-, c. *d̂ĥĝw̄h̄  

Exercise 10  

Exercise 11  

Exercise 12  
a. *eu : *u, b. *o vs. *e or zero, c. *oi vs. *i, d. *on vs. *n  

Exercise 13  
a. *kHt-, b. *h₂ner, c. *h₁regʷ-, d. *h₁lnĝ-, e. *h₂est-, f. *th₂ĝ-, g. *h₂e_i-, h. *kh₂p̓-, i. *spHoi- (or *sph₂eï-), j. *keh₂ulo-, k. *Hor₂ĝ-, l. *uiHro-  

Exercise 14  

Exercise 15  

Exercise 16  
a. *h₃nobʰ-, vs. *h₃nbʰ-, b. *leh₁d- vs. *lh₁d-, c. *d∧m₂h₂ vs. *ndm₂h₂os  

Exercise 17  

Exercise 18  
a. *derk-, *dork-, *drk-, *dork-  
  b. *bʰeid-, *bʰid-, *bʰoid-, *bʰeoid-  
  c. *bʰu₂d-, *bʰoud-, *bʰeud-, *bʰud-, *bʰeud-, *bʰud-  
  d. *drem-, *drm-, *drom-  
  e. *h₃reg-, *h₃rog-, *h₃rg-, *h₃rg-, *h₃reg-  
  f. *h₂ueh₁-, *h₂ueh₁-, *h₂uh₁-  
  g. *keuH-, *kuH-, *kuH-  
  h. *terh₁-, *trh₁-, *torh₁-  
  i. *h₃n̄gʰ-, *h₃n̄gʰ-, *h₃n̄gʰ-  

Exercise 19  
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Exercise 20
  a. Gr. plēthús, b. pothéō, c. teúkhō, d. téλσον, e. élaphos, f. omeĩkhō

Exercise 21
  a. máνas, b. cakrá-, c. bhāraya, d. dhūmásya, e. ašīrtα-, f. buddha-, g. ririhuśi-

Exercise 22

Exercise 23
  a. Gr. nēphos, Av. nabhā (nabah-), b. Skt. jūṣṭīṣ, Goth. kūsts, c. Lat. *prāmo- (attested in prandium ‘lunch’), Lith. pirmas, d. Lat. trūd-, Goth. þraut-, OCS trūd-

Exercise 24

Exercise 25

Exercise 26
  a. *h₂éb-: stressed e-grade; *-ol: zero grade *-l in phase 1, unstressed *-ol in phase 2, then lengthening before word-final resonant.
  b. *uēd-: stressed e-grade; *-or: zero grade *-r in phase 1, unstressed *-or in phase 2, then lengthening before word-final resonant; *-ēn-: stressed e-grade.
  c. *h₂nēr: stressed e-grade, then lengthening before word-final resonant.
  d. pod-: zero grade *-pd- in phase 1, unstressed *-pod- in phase 2.
  e. *nēbʰ-: 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; *-ēs-: 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. *-Ω/*-s, f. -Ω, g. *-bʰi, h. *-ns, i. *-(e)h₁, j. *-i, k. *-su, l. *-Ô, m. *-(e)i, n. *-mus
Exercise 31
a. PD, b. static, c. PD, d. HD, e. HD

Exercise 32
a. PD. Prototype: nom.acc. *ǵén-s, gen. *ǵn-ės-s
c. HD. Prototype: nom. *h₁ós-us-s, acc. *h₂us-ės-m, gen. *h₂us-s-ős

Exercise 33
a. zero grade in the root, full grade in the suffix in the nom.sg, final accent. PIE *urh₁-ėn, *urh₁-n-ős.
b. zero grade in root and suffix but full grade in the ending of the ins.sg. PIE *bʰiH-s-ėh₁.
c. full grade in the root in nom.sg, zero grade of root and suffix in the ending. PIE *h₁ér-h₂s(+ -as), *h₁r-h₂-ős.
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 *h₂s-tér (+ -za), *h₂s-tér-m.

Exercise 34
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 < *wlätós, OIr. flaith < *wlätís, with Proto-Celtic *wlå- < PIE *ulH- before *-tô-, *-tí-.

Exercise 35
a. nom.sg. *gʷén-h₂-s, acc.sg. *gʷén-h₂-m, gen.sg. *gʷn-ėh₂-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, gná en gnám by interpreting the gen.sg. gnáš as an a-stem.

Exercise 36
*ues-r/n-. nom. *ués-r, gen. *us-ėn-s.

Exercise 37
a. *-u-ős, b. *-u-ős, c. *-i-ėi, d. *-u-ős, e. *-u-ėi, f. *-u-ős, g. *-i-ős, h. *-ėu-m (for *-eũ-m).
Exercise 38
a. HD (*-u-éh₁), 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

Exercise 40

Exercise 41
a. *suHnéues *uh₂,th₁ós
b. *gʰkimí (or *gʰiém) *h₁édmn *kunmus
c. *dérubhi *gʷłh₃nóm
d. *bʰorm *h₂iésh₁
e. *kéh₂uōs *ikʷéns

Exercise 42

Exercise 43
a. *uiHröi *pertstlos
b. *uoḡʰoi *suepnom
c. *kúítнōs *h₂rkōs
d. *ulkʷom *porkōs

Exercise 44
a. *h₁mēh₂, b. *gʰr₃h₂-u-ih₂-m, c. *medʰioi, d. *dʰrugʰ-unt-ih₂

Exercise 45
a. PIE *sén-iōs, b. *prHmonds, c. *kukʰw-i, d. *pH₃-u-ih₂, e. *m(e)giēses

Exercise 46
a. Goth. filu < PIE *pēH-u, Gr. polús < *polH-u-s, Skt. purú < *pH-u.
b. PIE *pH-nō-s (Gr. and Latin plēnus show that the *H here is *h₁)

Exercise 47
a. *sn-is-éi *h₂n-r-éi
b. *pt-n-unt-bʰi *uekʷ-(o)s-bʰi
c. *mɡ-éh₂-m *ku-n-ih₂-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 *kʷo- is also related but the origin of the different vowel is unclear. (3) The case endings are the pronominal endings also found in *h₁e, *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 *ke (see 17.3) The acc. often indicates a limited amount of time.
Lat. sic < *seike contains an old pronominal ins.sg., maybe *h₁ei 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 *kī, which, in some branches of IE, became an inflected deictic pronoun.
U. esmik < *esmike contains the loc.sg. *h₁ésmi of the pronoun *h₁e, plus deictic *ke.

Exercise 49
a. *id-id + *-ke, b. *sā-pe-sā, that is, twice the f. *seh₂- with the particle *pe, c. PIE *si-
h₂sih₂, d. Twice PIE *so plus the particle *de.

Exercise 50
a. By means of the (enclitic) gen.sg. of the personal pronoun (*h₁moi), b. By means of the possessive adjective (*h₁mo-).

Exercise 51
kas < *kʷos, ka < *kʷod, quai < *kʷeh₂-i, kasmu < *kʷosmōi, kan < *kʷom; toū < *tuH, ioulos < *iuH-s.

Exercise 52
These forms contain in their first member the nom. of the pronoun m. *h₁e, f. *ih₂ (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 consisted 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. *kʷétuores
> pedwar (p reflecting the labiovelar, and dw < *tw), whereas pedeir must reflect
fem. *kʷetursres > *kʷeturs with -sr- yielding -ir- as in ‘three’.
b. naontek ‘19; pemp ‘5; dek ‘10; pevar ‘4’ (m.), trizek ‘13; ugent ‘20’
c. *trios *h₂n̥r; *potnih₂m *dwi; *duoih₁ *h₂néh₃mnih₁ (nom.acc.du.); *Hoi(H)noei
*prHuom *nmrtom

Exercise 54
a. *spék-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. *ǵnh₁- ske- sk-pres. them. 2pl. sec.
i. *di-dh₁- red. pres. athem. 1pl. prim.
j. *uer-úrg-ie- intensive ie-pres. them. 3pl. sec.

Exercise 55

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

Exercise 58
*h₁éklet, *kléio, *kekloie

Exercise 59
a. act. (*-onti), b. mid. (*-medʰh₂+i), c. mid. (*-to), d. intr.mid. (*-o+i), e. act. (*-tí), 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
Exercise 62
a. *h₁ɨndénti, b. *kʷérti, c. *duístó, d. *dʰoróioh₁s, e. *h₁siéh₁s, f. *h₁ésteh₂m, g. *uéuoiké

Exercise 63

Exercise 64
a. *ludʰitó-, b. *kHluomh₁no- (>>-*io-), c. *h₁dnó- (>>IIr. *Had-), d. *ntrsto-, e. *plkéno-

Exercise 65


Exercise 66
a. Phonology: the laryngeals are rendered not with the symbols h₁, h₂, h₃, but with the phonetic symbols for their putative pronunciation, ʔ, r and ð. The traditional triad t, d, dʰ is here rendered by t, ð, 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 õ. Here is the text with separated morphemes and grammatical glosses:

(1) ʃʰeu.i-s  io-i  ʃuel.in.es  nê-zs  ðek.u-ns  ðe sheep-NOM.SG REL.DAT WOOL-NOM.SG NEG-be-3SG.INJ horse-ACC.PL then

uēi’d tom  gʰr’e-um uoɡ.o-m uēɡ-ont-m see-3SG.AOR DEM.ACC.SG.M heavy-ACC.SG wagon-ACC.SG CONVEY-PTC-ACC.SG

tom  m’ɡ.es-m  bor.o-m DEM.ACC.SG.M big-ACC.SG load-ACC.SG

tom  dɡm.en-m  ʃo.ʃk.u  ber-ont-m DEM.ACC.SG.M man-ACC.SG fast-ACC.SG.N carry-PTC-ACC.SG
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°)
Cʹ palatalized consonant (also C´)
Cʰ aspirated consonant
Cʼ glottalized, ejective consonant
Č nasalized consonant
Ř In IE: vocalic sonant (NB in phonetics this sign indicates a voiceless sound)
$R$ consonantal glide
$V$ vowel
$\tilde{V}$ short vowel
$\tilde{V}$, $V$: long vowel
$\tilde{V}$, $\breve{V}$ nasalized vowel
$\emptyset$ 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 frequent-
ly 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)

<table>
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<th>central</th>
<th>back</th>
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<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>1</td>
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<tr>
<td>high</td>
<td>$i$</td>
<td>$y/\ddot{u}$</td>
<td>$i$</td>
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<tr>
<td>–</td>
<td>$I$</td>
<td></td>
<td></td>
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<tr>
<td>middle high</td>
<td>$e$</td>
<td>$\phi/\ddot{o}$</td>
<td>$\ddot{y}/\ddot{e}$</td>
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<tr>
<td>–</td>
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<td></td>
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<tr>
<td>middle low</td>
<td>$\epsilon$</td>
<td>$\ae/\ddot{i}$</td>
<td>$\lambda/\ddot{e}$</td>
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<tr>
<td>low</td>
<td>$\ae$</td>
<td></td>
<td>$a$</td>
</tr>
</tbody>
</table>
3. Consonants
See also the illustration on the next page. After the comma the voiced form is given.

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<tr>
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<th>4</th>
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<th>5b</th>
<th>6</th>
<th>7</th>
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<th>9</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td>stop</td>
<td></td>
<td>p, b</td>
<td>t, d</td>
<td></td>
<td>f, ɗ</td>
<td>c, ɗ</td>
<td>k, g</td>
<td>q, G</td>
<td></td>
<td></td>
<td>?</td>
</tr>
<tr>
<td>affricate</td>
<td></td>
<td>pf</td>
<td>ts, dz</td>
<td>tf, dz</td>
<td>kx</td>
<td></td>
<td></td>
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<tr>
<td>fricative</td>
<td></td>
<td>φ, β</td>
<td>f, v</td>
<td>θ, δ</td>
<td>s, z</td>
<td>s, z</td>
<td>f, ʒ</td>
<td>ç, ɭ</td>
<td>x, γ</td>
<td>χ, κ</td>
<td>h, ɾ</td>
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<td></td>
<td>m</td>
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<td>ɭ</td>
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<td>lateral fric.</td>
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<td>ɭ, ɭ</td>
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<tr>
<td>trill / tap</td>
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<td>r / ρ</td>
<td></td>
<td>- / ɾ</td>
<td>r</td>
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<tr>
<td>approximant</td>
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<td>v</td>
<td>ɹ</td>
<td>ɻ</td>
<td>j</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

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, Č: Č
- glottalized, $C'$: ʔ
- velarized, $O'$: ɭ, a ‘thick’ ɭ, nearly as in E. wall
- palatalized, $C'$: ɾ, ʂ, ʃ', ɭ', ʊ'

**Alternative / more traditional consonant notations:**

t, ɗ = t, ɗ  x, γ = ç, ɭ
k, ɭ = c, ɭ  n = ɲ
tʃ, dz = tf, dz  n̩ = n̩
s, z = s, z  l = l
ś, ż = 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 ø, e.g. *-ter, *-tor-), zero grade (without a vowel: *-tr-) and the lengthened grade (with long vowel ē or ĕ: *-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 vīc-tus) and suffix (-ing in danc-ing).

Affricate, a consonant which begins as a stop and ends as a (homorganic) fricative, as °f 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 periculum. See °svarabhakti.

Aniṭ, a Sanskrit root not ending in -i (< laryngeal), and also a PIE root not ending in a laryngeal. Compare °set.

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. epīskopos.
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 theōs with ὑ.

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 *kmtom > Skt. śatām, Av. satam; 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, e-, 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 °front vowel.

Bahuvi, (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.

Bilingual, 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 (*k* etc.) are continued as velars, e.g. *kmtom* > 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. *llyoden* ‘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 *set.

Dorsal, see *velar.

Elision, the loss of a short vowel (seldom a diphthong) at the end of a word before the initial vowel of the following word. For instance Gr. ep' emoí for epi, boulom' egó for boulomai.

Enclitic, words so closely connected with the adjacent word that together they form an (accentual) unit. For instance Gr. theósis 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 *bahuvrihi.

Flap, a sound produced by quickly blocking the air stream once. The retroflex r can be produced in this way.

Flexion, see *inflection.

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 distictively longer than a simple consonant, e.g. [tː].

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. senatūs (gen.) consultum 'senate’s decision'.

Gerund, a verbal noun; e.g. Lat. modus vivendi (ger.) 'way of living'.
**Gerundive**, a passive verbal adjective indicating necessity (‘which must be...’), e.g. *triumviri rei publicae constitutandae* “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 *European* between *e* and *a*. Whether or not such a sound is a phoneme depends on the 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 *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.

**Guna**, 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. *húdór* ‘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 *patér, patéra, patrós*. The opposite is called protodynamic, 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.

**Inflection**, °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 ě and č, 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 ȥ.
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).
Morphophonology, 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, proparoxytonon 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. *pěred* 'before' < *perd* (OCS *prědo*, 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): *fouirish.*

Progressive assimilation, (also perseverant) "assimilation whereby the following sound is influenced by the previous sound, e.g. NHG *Zimmer* < MHG *zimer.*

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. *r*. See sonorant.

Retroflex, a sound produced by curling back the tongue. Sanskrit *t* and *s* 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 ø, u.

Samprásārana, 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 pedión 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 °anit, °disyllabic root.

Shwa, (G. Schwa) the name for a neutral vowel, ø (as the e in E. taken). The term was taken from Hebrew.

Sibilant, fricatives and affricates pronounced with a hissing sound, like s, z, ŋ, ņ, 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 [melk] 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 < *au-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 (subj.), 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 *e; for instance Gr. lég-o-men, lég-e-te ‘we, you say’. As opposed to athematic, e.g. Gr. phê-mi ‘I say’. Thematic is also used with nouns to refer to the o-stems.

Udātta, ‘raised’, the Sanskrit term for the main stress (pitch). Anudāṭa (‘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 *gaṇa and *ablaut.

Zero, linguistic term for nothing, no sound; sign Ø.

Zero grade, see *ablaut.
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**

BSL = Bulletin de la société de linguistique de Paris.
IBS = Innsbrucker Beiträge zur Sprachwissenschaft.
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.
UP = University Press

**I. GENERAL INTRODUCTION**

I.1 The language families of the world

*Eurasia and Oceania*

Boeder, W. 2005 The South Caucasian languages. *Lingua* 115, 5–89.
Shibatani, M. 1990 *The languages of Japan*. Cambridge UP.
Foley, W. 1986 *The Papuan languages of New Guinea*. Cambridge UP.
Dixon, R. 2002 *Australian languages: their nature and development*. Cambridge UP.

**Africa**

Heine, B. & D. Nurse (eds.) 2008 *A linguistic geography of Africa*. Cambridge UP.

**America**

Adelaar, W. 2004 *The languages of the Andes*. Cambridge UP.
Mithun, M. 1999 *The languages of native North America*. Cambridge UP.
Renault-Lescure, O. & L. Goury (eds.) 2009 *Langues de Guyane*. Marseille:IRD.
Suárez, J. 1983 *The Mesoamerican Indian languages*. Cambridge UP.
World


1.2 Linguistic surveys of modern Indo-European languages

Masica, C. 1991 The Indo-Aryan languages. Cambridge UP.
Posner, R. 1996 The Romance languages. Cambridge UP.
Harbert, W. 2007 The Germanic languages. Cambridge UP.

1.3 History and culture of the Indo-European peoples

1.3.1 Material and spiritual culture of the Indo-Europeans

General

Anthony, D. 2007 The horse, the wheel and language: how Bronze-Age riders from the Eurasian steppes shaped the modern world. Princeton UP.


Lincoln, B. 1991 Death, war, and sacrifice. Chicago UP.


Puhvel, J. 1987 Comparative mythology. Baltimore: Johns Hopkins UP.


Specific


13.2 History and religion of the IE peoples


Basham, A. 1954 The wonder that was India. New York: Grove.
Diakonoff, I. 1984 The pre-history of the Armenian people (translated from the original of 1968 by Lori Jennings; with revisions by the author). Delmar: Caravan.
Dvornik, F. 1962 The Slavs in European history and civilisation. New Brunswick: Rutgers UP.


Green, D. 1998 Language and history in the early Germanic world. Cambridge UP.

II. LANGUAGE CHANGE

II.1 Historiography of linguistics


II.2 Historical linguistics

III. INDO-EUROPEAN LINGUISTICS

III.1 Introductions, grammars and dictionaries

*Indo-European*

*Introductions and grammars:*

*Dictionary:*

*Anatolian*

*Grammars:*
Kimball, S. 1999 Hittite Historical Phonology. Innsbruck: IBS.

Texts:

Dictionaries:
Tischler, J. 1997- Hethitisches etymologisches Glossar. Innsbruck: IBS.

(Vedic) Sanskrit

Grammars:
Renou, L. 1952 Grammaire de la langue védique. Paris/Lyon: IAC.

Texts:
Aufrecht, Th. 1877 Die Hymnen des Rigveda. 2nd ed. Bonn: Marcus.

**Texts in translation:**

*Atharva-Veda Samhîtā.* 1905 Translated into English with critical notes and exegetical commentary by W.D. Whitney ... Revised and edited by Ch.R. Lanman. Cambridge (MA): Harvard UP.
Mylius, K. 1981 *Älteste indische Dichtung und Prosa.* Wiesbaden: VMA.

**Dictionaries:**

Monier-Williams, M. 1899 A Sanskrit English dictionary. 2nd ed. Oxford UP.

**Old Iranian**

**Grammars:**


**Texts:**


Texts in translation:

Dictionaries:
Bartholomae, Ch. 1904 Altiranisches Wörterbuch. Strassburg: Trübner.

Tocharian

Grammars:

Texts:

Dictionaries:
Adams, D. 1999 A dictionary of Tocharian B. Amsterdam/Atlanta: Rodopi.


**Armenian**

**Grammars:**


Kortlandt, F. 2003 *Armeniaca. Comparative notes.* Ann Arbor: Caravan. [Collected writings on Armenian]


**Texts:**


**Texts in translation:**


Dictionaries:

Phrygian

Grammars:

Texts:

Greek

Grammars:
**Texts:**

**Dictionaries:**
Beekes, R. 2010 *Etymological dictionary of Greek*. With the assistance of Lucien van Beek. Two vols. Leiden/Boston: Brill.

**Albanian**

**Grammars:**

**Texts in translation:**

**Dictionaries:**
Demiraj, B. 1997 *Albanische Etymologien*. Amsterdam: Rodopi.
Huld, M. 1984 *Basic Albanian etymologies*. Columbus, Ohio: Slavica.

**Baltic**

**Grammars:**


Texts:


Dictionaries:


Slavic

Grammars:


Texts:


http://gramoty.ru/ (all Old Russian birchbark texts)

Texts in translation:


The lay of the war waged by Igor. 1981 Moscow: Progress. [Text, modern Russ. and Eng. transl.]


Dictionaries:


**Italic**

**Grammars:**
Meiser, G. 1986 Lautgeschichte der umbrischen Sprache. Innsbruck: IBS.

**Texts**

**Dictionaries**

**Venetic**
Celtic

Grammars:
McCone, K. 1996 Towards a relative chronology of ancient and medieval Celtic sound change. Maynooth: Department of Old Irish.
Jackson, K. 1953 Language and History in Early Britain: a chronological survey of the Brittonic languages, first to twelfth century A.D. Edinburgh UP.

Texts:
Stifter, D. 2006 Sengoidélec. Old Irish for beginners. Syracuse UP.
Strachan, J. 1949 Old Irish paradigms and selections from the Old-Irish glosses. Dublin: Royal Irish Academy.

Texts in translation:

Dictionaries:

Germanic

Grammars:
Wright, J. & E. Wright 1925 Old English grammar. Oxford UP.


**Texts:**
Marsden, R. 2004 *The Cambridge Old English reader*. Cambridge UP.

**Texts in translation:**
*Beowulf*. Translated by D. Wright. 1957 Harmondsworth: Penguin.

**Dictionaries**


### Fragmentary languages

**Illyrian**


**Thracian, Macedonian**


**Messapian**


**Sicily**


teca di Storia Patria, 951–1012.


**Lusitanian**

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


2.5 Indo-Uralic, Nostratic


3.3 The arrival of the Indo-Europeans; IE and non-IE substrates


11.3.2 & 11.3.3 Palatals, velars and labiovelars, The three velar series


11.3.6 Glottalized consonants

Kortlandt, F. 2007 Lachmann's law again. ICIL 121–123.

11.3.8 The Gmc. and HG sound shifts

Kortlandt, F. 2010 English bottom, German Boden, and the chronology of sound shifts. SGIEIU 197–199.
Kortlandt, F. 2010 Glottalization, preaspiration and gemination in English and Scandinavian. SGIEIU 293–297.

11.3.9 Skt. *ks* — Gr. *kt*


11.5.1 Sievers’ law


11.6.2 PIE *a*


11.8 Laryngeals

Beekes, R. 1988 PIE RHC- in Greek and other languages. *Indogermanische Forschungen* 93, 22–45.


11.9 Accent and tones

Bally, Ch. 1945 *Manuel d’accentuation grecque*. Bern: Francke.


Schaffner, S. 2001 *Das Vernersche Gesetz und der innerparadigmatische grammatische Wechsel des Urgermanischen im Nominalbereich*. Innsbruck: IBS.


11.9.4 Balto-Slavic accentuation


Kortlandt, F. 2009 Historical laws of Baltic accentuation. BBS, 1–12.
Stang, Ch. 1965 Slavonic accentuation. 2nd ed. Oslo UP.

12.1.1 Structure of roots

Pp. 147–173.

12.2 Ablaut


12.3 The origin of ablaut


13.1 Word formation


### 13.1.4 Compounds


Lindner, T. 2002 *Lateinische Komposita*. Innsbruck: IBS.


### 13.2.2 Number and cases, case-endings


### 13.2.3 Feminine


### 13.2.4–13.2.7 Inflectional types

Beekes, R. 1985 *The origins of the Indo-European nominal inflection*. Innsbruck: IBS.

Comparative Indo-European Linguistics

Kuiper, F. 1942 Notes on Vedic Noun-Inflection. Amsterdam: KNAW.

13.2.10 Historical relation of the inflectional types


13.2.11 Dual


14. Adjective


15. Pronouns

15.2.1 Demonstratives


15.2.3 Relatives


15.3 Personal pronouns


16. Numerals


17. Indeclinable words


18. The verb


Kortlandt, F. 2007 The Old Irish absolute and conjunct endings and questions of relative chronology. ICIL 1–23.

Kortlandt, F. 2007 Old Irish subjunctives and futures and their PIE origins. ICIL 65–74.


McConé, K. 1982 Further to absolute and conjunct. Ériu 33, 1–29.

McConé, K. 1991 The Indo-European origins of the Old Irish nasal presents, subjunctives and futures. Innsbruck: IBS.


### 18.1.3 Reduplication


### 18.2.1 Present stems


Joachim, U. 1978 Mehrfachpräsentien im Rigveda. Frankfurt am Main: Lang


18.2.2 Present endings

Kortlandt, F. 2010 The Indo-Uralic verb. SGIEIU 391–403.

18.3 Aorist


18.4 Perfect


18.5 Middle

Kortlandt, F. 2010 1st sg. middle *-H₂, SGIEIU 81–90.
Lühr, R. 1978 Die Kontinuante der urindogermanischen Medialflexion im Germanischen. MSS 37, 109–120.
Rix, H. 1988 The PIE Middle: Content, Forms and Origin. MSS 49, 101–120.

18.7 Static inflexion

Beekes, R. 1973 The proterodynamic perfect. KZ 87, 86–98.

18.8 Moods

Kortlandt, F. 2007 Old Irish subjunctives and futures and their PIE origins. ICIL 65–74.

18.9.1 Particles

Beekes, R. 1982 GA v. mā, the PIE word for 'moon, month', and the perfect participle. Journal of Indo-European Studies 10, 53–64.

### 18.9.3 Verbal nouns

Disterheft, D. 1980 *The syntactic development of the infinitive in IE*. Columbus: Slavica.


### 18.10 The PIE verbal system


Kortlandt, F. 2009 Toward a reconstruction of the Balto-Slavic verbal system. *BBS* 151–165.


Rix, H. 1986 *Zur Entstehung des urindogermanischen Modussystems*. Innsbruck: IBS.

### III.3 Reviews of the first edition


III.4 Translations of the first edition

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.

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.
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.

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 Palaiic, 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 Picenian 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 subgroup 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.
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 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

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.

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 Vṛtra, who withheld the life-giving waters of heaven. With ‘both worlds’ (the dual rōḍasi) 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:

\[
\text{sraptā gāusāiś vahistā} \ \text{auuaēnatā sūcā manaŋhā} \\
\text{āuuaranā viciibahīiā} \ \text{nāram nāram x'āxīiā tanuuiē} \\
\text{parā mazā yāŋho \ ahmāi [nā] sazdiiā baodantō paitī}
\]

‘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.
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 sirec’ ašxarhk’ә or ir miacin Ordin towaw, or amen noran hawa-tac’ola č’korši (read č’korč’i), ayl yawitenakan keank’n 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 Hat-tusas. 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 u-e-eh-zi
(10) na-as-kan Šmi-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 proclamation 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’.

This makes: EGO-wa/i-mi-i TONITRUS.HALPA-pa-CERVUS₂-ti-i-ia-sa“We are Halparuntiyas tarwanis kurkumawanis hantawatis ‘I am Halparuniya, 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 Areystis' (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.)
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, Cyrillic, 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: Въ оно [връёмъ] вънидє иоусъ въ градъ самаренскъ наріцаємъ иоунарія исірь врсъ, яжє дастъ иаковъ іосифу сънову своему — “At that [time] Jesus came in a town of Samaria, named Souchar, near the place which Jacob had given to his son Joseph.”
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 Selivstro napsaxę roupisanię* — ‘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 teenēskoa razeandom eantilezy ptamiēe raz ēlta.
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 K"erek"otäs, so much seed: WHEAT 2 T 3'
```

Tablet Ad 666 says:

```
pu-ro a-ke-ti-ra-o ko-wo MAN 20 ko-wo 7
Puloi (?)askêtriôn korwoi MAN 20 korwoi 7
'In Pylos, children of the …ters, 20 men, 7 boys'
```
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 aviðos ϑotorridas ana aprodit[a] apa ogrebis* (but the separation of the words is uncertain!). It cannot be translated. *klohi* may be ‘listen!’; *aprodit[a]* 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):

\textit{eisteterai poplosiosio valesiosio / suodales mamartei}

‘…placed(?) of Poplios Valesios / the followers for Mamars.’

Poplios Valesios agrees with Lat. Publius Valerius; Mamars is the god Mars.
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 / attieŕiu; note 8 = f). The upper part is in the national alphabet, which was derived from the Etruscan alphabet. The lower part, in Latin script, was added later.
Few inscriptions are known in this language, but it is the oldest of the Italic languages beside Latin. — The text mentions *safinas tūtas*, '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* ‘Cois, son of Drutos, his youngest brother, placed and erected (this tomb).’ In Gaulish, in a North Italic alphabet, it says: *ateknati trut[i]kni karnitu artuaś koisis trutknos,* 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 20](image)

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) _usama_, the town (Lat.) Uxama, now Osma, west of Soria.

![Illustration 21](image)

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: _Dofet 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 22](image)
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 alliteration, c…c-, also c[h]…c-, e…e-): Fochen Cet, Cet mac Mághach, magen c[h]urad, cride n-ega, eithre n-ela, eirr trén tressa, trethan ágach, cain tarb trnúthach, Cet mac Mághach — ‘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 márach.)
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.
Illustration 25. The Gothic alphabet. It is largely based on the Greek alphabet, but h, r and s are taken from Latin, while p, j, u and f were taken over from the runes. The signs for 90 and 900 are of Greek origin.
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1. **English**

An index of English words of which the etymology is discussed (for Old and Middle English see index 3.6.)

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