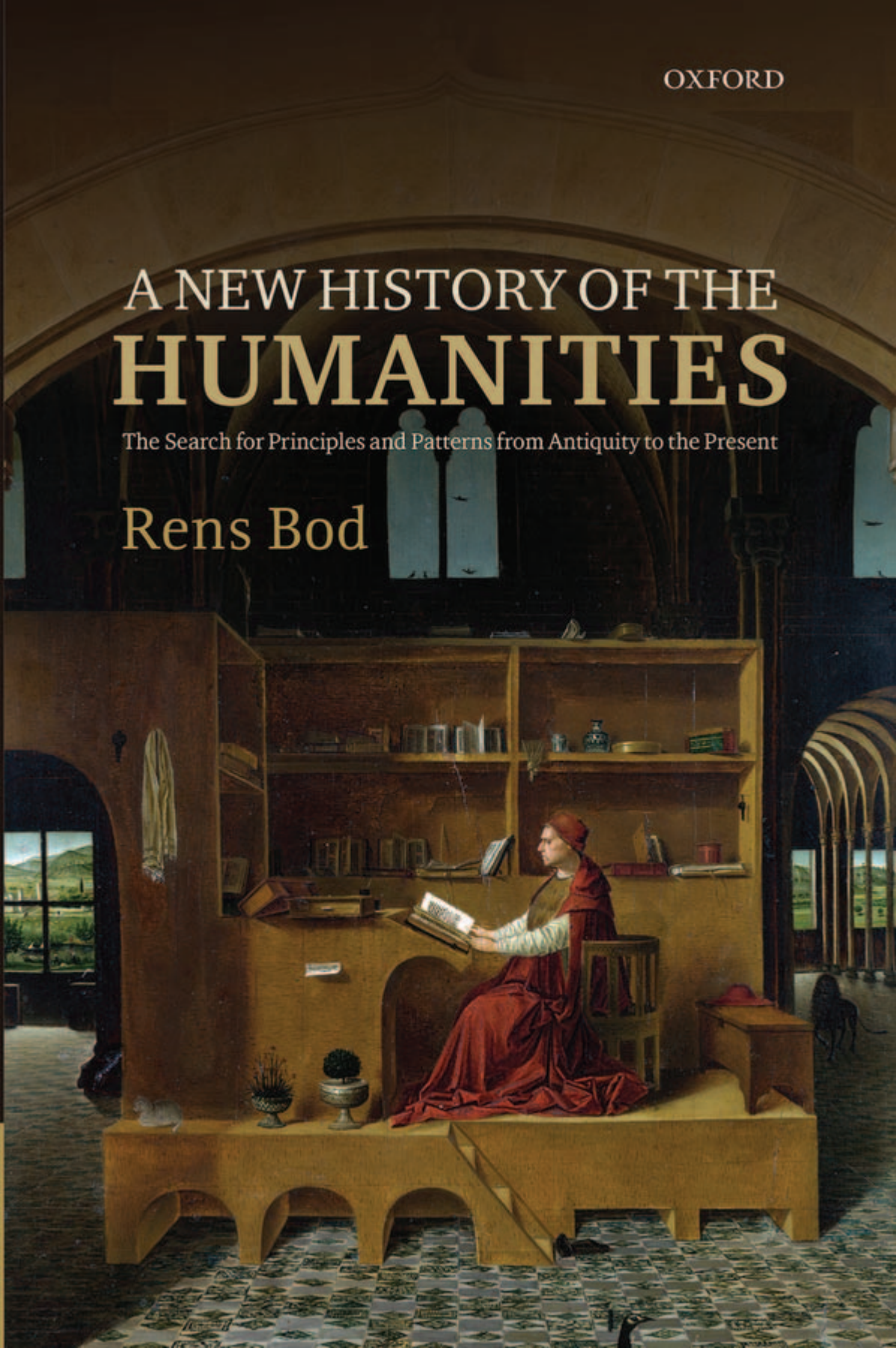
OXFORD

A NEW HISTORY OF THE HUMANITIES

The Search for Principles and Patterns from Antiquity to the Present

Rens Bod



A NEW HISTORY OF THE HUMANITIES

A New History of the Humanities

The Search for Principles and Patterns from Antiquity to the Present

RENS BOD

OXFORD
UNIVERSITY PRESS

OXFORD
UNIVERSITY PRESS

Great Clarendon Street, Oxford, OX2 6DP,
United Kingdom

Oxford University Press is a department of the University of Oxford.
It furthers the University's objective of excellence in research, scholarship,
and education by publishing worldwide. Oxford is a registered trade mark of
Oxford University Press in the UK and in certain other countries

First Edition published in 2013

Impression: 1

Published in the United States of America by Oxford University Press
198 Madison Avenue, New York, NY 10016, United States of America

British Library Cataloguing in Publication Data
Data available

Library of Congress Control Number
Data available

ISBN 978–0–19–966521–1

Printed and bound in Great Britain by
CPI Group (UK) Ltd, Croydon, CR0 4YY

The publisher gratefully acknowledges the support
of the Dutch Foundation for Literature.

If two rules conflict, the last rule prevails.

Panini, *c.*500 BCE

For many states that were once great have now become small, and in my lifetime those that are great used to be small.

Herodotus, *c.*440 BCE

The poet should prefer probable impossibilities to improbable possibilities.

Aristotle, *c.*335 BCE

No pyknon, neither a complete pyknon nor a part of one, is melodically adjacent to another pyknon.

Aristoxenus, *c.*310 BCE

When things reach their period of greatest flourishing, they begin to decay.

Sima Qian, *c.*100 BCE

His style was fine and subtle, his brush without a flaw, yet his workmanship was inferior to his ideas, and (in his case) fame surpassed reality.

Xie He, *c.*500

It is wrong when the beginning of a sentence is in conflict with the end of it.

Sibawayh, *c.*790

The tradition regarding an event which in itself does not contradict either logical or physical laws will invariably depend for its character as true or false upon the character of the reporters.

al-Biruni, 1030

History is composed of the news about the days, states, and previous centuries. It is a theory, an analysis, and justification of creatures and their principles, and a science of how events happened and their causes.

Ibn Khaldun, 1377

In every painting it is therefore important that all members do what they are supposed to do in such a way that even the smallest part does not fail to contribute to the subject.

Leon Battista Alberti, 1435

But at last he brought it thus far, that he could demonstrate the whole Trinity to be represented by these first rudiments of grammar, as clearly and plainly as it was possible for a mathematician to draw a triangle in the sand.

Desiderius Erasmus, 1511

I wish to be a good grammarian. Religious discord depends on nothing except ignorance of grammar.

Joseph Scaliger, 1603/7

Whenever I find an unknown source, I am so overjoyed that I cannot sleep.

Gu Yanwu, 1660

One can understand only what one has created.

Giambattista Vico, 1725

History is on every occasion the record of what one age finds worthy of note in another.

Jacob Burckhardt, 1885

A linguistic system is a series of differences of sound combined with a series of differences of ideas.

Ferdinand de Saussure, 1916

All fairy tales are of one type in regard to their structure.

Vladimir Propp, 1928

Music was destined to reach its culmination in the likeness of itself.

Heinrich Schenker, 1935

A fully adequate grammar must assign to each of an infinite range of sentences a structural description indicating how this sentence is understood by the ideal speaker-hearer.

Noam Chomsky, 1965

Every discourse, even a poetic or oracular sentence, carries with it a system of rules for producing analogous things and thus an outline of methodology.

Jacques Derrida, 1986

To understand what understanding a film means, we must determine what previous knowledge someone needs to have in order understand filmic 'language'.

Christian Metz, 1992

And I think to myself, what a wonderful world.

Bob Thiele, George Weiss, Louis Armstrong

Contents

List of Illustrations

List of Table

Preface

The humanities are under pressure all over the world. Once the pinnacle of education and intellectual development, today they suffer from a serious image problem. Disciplines like philology, art history, linguistics, literary studies, and musicology are seen as a luxury pastime which is of little use to society and even less to the economy. Arguments in favour of the humanities emphasize their importance for critical thinking,[1] cultural consciousness,[2] historical responsibility,[3] and for creating competent, democratic citizens.[4] While these arguments may all be true, humanistic scholars seem to overlook the possibility that the very assumption behind the image problem may be wrong. They appear to have taken for granted that their field does not contribute to the economy or society. They stress that the humanities do not solve concrete problems and that their value lies elsewhere.[5] Yet a quick glance at the history of the humanities shows a different picture. Not only did humanistic insights change the world, many of these insights dealt with concrete problems and resulted in applications in entirely unexpected fields. As if humanists have no clue about their own history, these insights and applications have even been credited to the sciences.

Take Panini's discovery from around 500 BCE that the Sanskrit language was based on very precise rules, a so-called 'grammar'. This not only changed our perspective on language, it also contributed to the development of the first programming languages many centuries later. Or take Lorenzo Valla's fifteenth-century demonstration that 'The Donation of Constantine' was a fake. Suddenly the papal claim to worldly power appeared to be based on fiction. When in the seventeenth century Joseph Scaliger discovered that the earliest Egyptian kings were older than the presumed age of the earth, this led to a secular world view where it was no longer theologians but citizens who had the last word. And when Leon Battista Alberti gave the first description of linear perspective, it not only *literally* changed our view of the world but it led to revolutionary architectural design techniques as well. A more recent humanistic breakthrough is the discovery that languages in Europe and Asia are related via sound shift laws. This pointed to a common linguistic origin known as Indo-European which completely changed our view of the relationships between peoples, for better and worse.

[1] See e.g. Stefan Collini, *What Are Universities For?*, Penguin Books, 2012.
[2] Edward Said, *Orientalism*, Vintage Books, 1978; John Carey, *What Good Are the Arts*, Oxford University Press, 2006.
[3] Jörg-Dieter Gauger and Günther Rüther (eds), *Warum die Geisteswissenschaften Zukunft haben!*, Herder, 2007.
[4] Martha Nussbaum, *Not for Profit: Why Democracy Needs the Humanities*, Princeton University Press, 2010.
[5] Jonathan Bate (ed.), *The Public Value of the Humanities*, Bloomsbury Academic, 2010.

These examples of humanistic insights and discoveries are just the tip of the iceberg. The list also includes findings by Chrysippus, Sibawayh, Chen Kui, Ibn Khaldun, De Laet, Bopp, Lachmann, Propp, Panofsky, Todorov, and many more. Few of these scholars are widely known today, yet their insights have changed the world.

Why then is there no overview of the history of the humanities, while there are dozens of overviews of the history of science? Such a history is badly needed, if only to highlight the feats and deeds of humanistic inquiry. This book wants to fill this gap and offers the first overarching history of the humanities from Antiquity to the present day. The study of literature, art, theatre, and music is not only important to keep alive the great works from the past. In their critical investigations, humanists have revealed patterns that led to entirely unforeseen applications and insights. Many of these are forgotten. The aim of this book is to bring them back to life.

My personal interest in the history of the humanities was triggered when I discovered the lack of it. This happened in 1980 when I read some classics on the history and philosophy of science at the age of fifteen. I was immediately fascinated by the topic and wanted to read similar books on the history of 'humanistic disciplines'—which in the non-Anglophone world are also referred to as 'sciences' (see chapter 1). To my disappointment I could not find any work that focused on the history of the humanities. In the meantime I chose a different academic path. But the interest in the general history of the humanities remained: how did the study of language, music, art, literature, theatre, and the past originate, and how did they develop? Why is their history treated so differently from the history of the sciences? Apart from studies on the history of individual humanistic disciplines, there was no overview. Yet it had to be possible to write such a general history of the humanities.

My first, very modest start was the organization of a symposium on the history of the humanities together with Jaap Maat at the Three Societies' Meeting organized in Oxford, 2008. The reactions were encouraging enough to organize a much larger conference, now also together with Thijs Weststeijn, on the history of the humanities in the early modern period. This conference, The Making of the Humanities (23–5 October 2008), brought together around eighty historians and other scholars (with keynote speakers: Floris Cohen, David Cram, Anthony Grafton, and Ingrid Rowland) who shared a common interest in the comparative history of the humanities.[6] Although the conference was organized at short notice, the response far exceeded our expectations. It was clear that the subject triggered interest. The day after the conference I started writing this book.

It was as if I had entered a new world. I 'discovered' the Chinese theories of rhetoric and poetics. I learned about Arab historiography with its precise *isnad*

[6] The conference has become a bi-annual event, the last one being held in Rome in November 2012. Two edited volumes with papers from the conference have been published: Rens Bod, Jaap Maat, Thijs Weststeijn (eds), *The Making of the Humanities, Volume I: Early Modern Europe*, Amsterdam University Press, 2010, and Rens Bod, Jaap Maat, and Thijs Weststeijn (eds), *The Making of the Humanities, Volume II: From Early Modern to Modern Disciplines*, Amsterdam University Press, 2012. A third volume is in the making.

method. And I read about the fascinating Indian drama theory which was even more detailed than its Greek counterpart. And not to forget the African historiography with its specialists of the word, and the humanistic text-critical methods that continue to be used even today. How could it be that these fields of knowledge were never brought together? Again and again I fell in love with a period, a region, or a person. In the summer of 2010 the Dutch manuscript was finished and published in the same year.[7] The book was well received in the Netherlands and Belgium, and a year later the text was translated into English by Lynn Richards. Her translation forms the basis of the current, updated, and extended work.

I am indebted to a great many people. Floris Cohen was most encouraging and helpful while I was writing both the Dutch and the English versions of this book. His work on the comparative history of science is a continuous source of inspiration for my own work. Also Paul Voestermans's enthusiastic interest in the book's various stages and his many suggestions, also on the English version, have been of great importance. I am greatly indebted to Peter Engelfriet and Wim Raven for their excellent comments and suggestions on the Chinese and Arabic humanities respectively. They have been truly wonderful. Dirk van Miert is gratefully acknowledged for checking the Latin and for several other suggestions. OUP's editor Christopher Wheeler has been most helpful with his advice and with finding the best possible readers for the last versions of the book. It was also a great pleasure to work with Leston Buell on the copy-editing of this book. As always, all errors are my responsibility. I also wish to express my gratitude to Ruud Abma, Pieter Bakker, Wouter Beek, Johan van Benthem, Albert Blankert, Anne Blankert, Livio Bod, Bart van den Bosch, Jeroen Bouterse, David Cram, Marjolein Degenaar, Kees van Dijk, John van Eck, Els Elffers, Mark Hannay, Theo A. J. M. Janssen, Theo M. V. Janssen, Bart Karstens, Bram Kempers, Ellen Kempers, Wessel Krul, Charley Ladee, Michiel Leezenberg, Fenrong Liu, Jaap Maat, László Marácz, Marita Mathijsen, Daniela Merolla, Hajo G. Meyer, Wijnand Mijnhardt, Jan Noordegraaf, Peter van Ormondt, Henk Schultink, Floris Solleveld, Martin van Staveren, Siep Stuurman, Stan Verdult, Rienk Vermij, Gerlof Verwey, Thijs Weststeijn, Co Woudsma, Joost van Zoest, OUP's anonymous readers, and others I may have forgotten to mention.

Most important of all are Daniela and Livio. Without them this book could never have been written. Daniela's knowledge of the African humanities is unsurpassed and she saved me from falling into many of the Eurocentric pitfalls, while Livio gave most valuable feedback on the first version of this book. Finally, I was greatly inspired by two marvellous places during the last stages of this work. First, Guadaiona, in the middle of the frightening but magnificent *calanchi* of Bagnoregio where I lost my heart. And Colle San Giacomo near the tall but graceful Monte Velino with amazing vistas on the town of Tagliacozzo. Every view from the window was a blissful experience which kept me going.

[7] Rens Bod, *De Vergeten Wetenschappen: Een Geschiedenis van de Humaniora*, 1st edition 2010, 2nd and 3rd revised and updated editions, 2011, 4th updated edition, Prometheus, 2012.

It is impossible to be a specialist in all fields of the history of the humanities. For a new undertaking like this, criticism is essential. I thus call on the reader: if you find on the basis of your own expertise any conspicuous omission, inaccuracy or plain error, I would be grateful if you would let me know, either via email to <rens.bod@gmail.com> or via the weblog of this book: <http://historyofthehumanities.wordpress.com>. Of course, I reserve the right to disagree with you, but I will gratefully acknowledge every serious suggestion in a revised edition of this book—were such ever to appear.

1

Introduction: The Quest for Principles and Patterns

This is the first overarching history of the humanities in the English language.[1] Unlike the sciences and the social sciences, the humanities lack a general history. This is puzzling if we realize that for many centuries there was no distinction between humanities and science. Whether one wanted to grasp the secrets of the human or the natural world, it was part of the same intellectual activity. Pythagoras investigated both music and mathematics, and al-Biruni was both a historian and an astronomer. Even the icons of the scientific revolution—Galileo, Kepler, and Newton—were engaged in philology and the study of the natural world. This raises the question as to what extent the distinction between the humanities and science is essential or artificial. Where do their research methods differ? When did they develop in different directions? Is the famous Two Cultures debate sparked off by C. P. Snow in 1959 just a phenomenon of the last fifty years or has it existed before?[2] And have insights and discoveries in the humanities ever led to 'scientific' breakthroughs? A historiography of both the humanities and the sciences is indispensable in answering such questions.

What are the humanities? It is like the notion of 'time' in St Augustine: if you don't ask, we know, but if you ask, we are left empty handed.[3] Since the nineteenth century the humanities have generally been defined as *the disciplines that investigate the expressions of the human mind*.[4] Such expressions include language, music, art, literature, theatre, and poetry. Thus, philology, linguistics, musicology, art history, literary studies, and theatre studies all belong to the realm of the humanities, unlike

[1] The term 'humanities' is ambiguous in the Anglophone world. While today's use of the term commonly refers to a branch of academic *disciplines* such as literary studies, historiography, musicology, art history, theatre studies, and the like, it can also be used to refer to the *subjects* studied by these disciplines, such as literature, music, art, theatre. And sometimes the two meanings are even conflated. In this book I will use the term humanities to refer to the disciplines, or better (as I will argue below) to the *studies* of literature, music, art, theatre, etc. This use of the term corresponds to the German *Geisteswissenschaften* ('sciences of the spirit'), the Italian *scienze umanistiche* ('humanistic sciences'), or the Dutch *alfawetenschappen* ('alpha sciences').

[2] Charles Percy Snow, *The Two Cultures and the Scientific Revolution*, Cambridge University Press, 1959.

[3] St Augustine, *Confessions*, Book XI, chapter XX.

[4] Wilhelm Dilthey, *Einleitung in die Geisteswissenschaften: Versuch einer Grundlegung für das Studium der Gesellschaft und der Geschichte*, 1883, reprinted by Teubner, 1959. For an English translation, see Wilhelm Dilthey, *Selected Works*, volume 1, translated and edited by Rudolf Makkreel and Frithjof Rodi, Princeton University Press, 1991.

the study of nature, which belongs to the domain of science (such as physics, astronomy, chemistry, and biology). Similarly, the study of humans in their social context is one of the social sciences (such as sociology, psychology, anthropology, and economics). But these definitions are unsatisfactory. Mathematics is to a large extent a product of the human mind, and yet it is not considered a humanistic discipline. A pragmatic stance may be more workable: the humanities are the disciplines that are taught and studied at humanities faculties. According to this pragmatic 'definition', the humanities currently include linguistics, musicology, philology, literary studies, theatre studies, historical disciplines (including art history and archaeology), as well as more recent fields such as film studies and media studies. In some countries theology and philosophy are also taught in humanities faculties, whereas in others they are faculties in their own right.

The humanities come in different forms. They have a memory function by keeping alive the works from the past and the present, often through collections. They have an educational function by teaching these works to new generations. They also have a critical function by interpreting these works for the public at large. In addition to all this, the humanities have a research function by asking questions and posing hypotheses regarding humanistic artefacts. While often intertwined, these functions have not been equally prominent in all historical periods. Yet, as we will see, the research function of the humanities is conspicuous in all eras. It is exactly this *empirical* dimension of the humanities that forms the main focus of the current book.

This raises an immediate conceptual problem—to what extent can expressions of the human mind, such as language, literature, music, and art, be called 'empirical' if they are created by people? Is it not the case that the humanities study primarily 'the world in the mind' rather than an external one? Indeed, the products of the humanities have been created by people, but when the products manifest themselves in the form of manuscripts, pieces of music, literary works, sculptures, grammar books, plays, poems, and paintings, they are obviously just as open as other objects to empirical research and the development of hypotheses. We will see that since Antiquity humanistic material has indeed been exposed to hypotheses and evaluation relating to assumed patterns and interpretations.

In this book I show how scholars, from the ancient world to today, have explored humanistic material—language, texts, music, literature, theatre, art, and the past—and what insights they gained from it. I want to stress, perhaps unnecessarily, that a history of the humanities is not about the history of music, art, or literature, but about the history of musicology, art theory, and literary theory. This history begins with the birth of the first humanistic activities in Antiquity. It is often assumed that the humanities did not form a separate field of study before the nineteenth century.[5] In part this is true—at least for musicology which was until the

[5] See e.g. Hans-Georg Gadamer, *Wahrheit und Methode: Grundzüge einer philosophischen Hermeneutik*, Mohr, 1960, translated into English as *Truth and Method*, by Joel Weinsheimer and Donald Marshall, Continuum, 1975, pp. 3ff. See also Albert Levi, *The Humanities Today*, Indiana University Press, 1970. And see also Jörg-Dieter Gauger and Günther Rüther (eds), *Warum die Geisteswissenschaften Zukunft haben!*, Herder, 2007.

eighteenth century (also) regarded as a mathematical activity in the so-called *quadrivium* of the *artes liberales* (see 2.4 and 4.4). But it should not be forgotten that already around 1700 the conceptual distinction between a science of the human and a science of the natural was worked out by Giambattista Vico (see 4.2). And as early as from the fourteenth century onwards, we find a branch of thriving disciplines known as the *studia humanitatis* from which the (early) modern humanistic disciplines emerged (see 4.1). We can even discern an unbroken tradition in the study of humanistic material that goes back to the Roman *artes liberales* and further to the Hellenistic curriculum known as *enkyklios paideia* (see 2.7). In writing a general history of the humanities, we thus need to start where we first find these studies—in Antiquity.

But what would be the reason to separate the history of the humanities from the history of other disciplines—be it the natural or social sciences or even from the general history of knowledge? The endeavour to write a history of *all* disciplines was attempted by George Sarton in the 1930s.[6] However, the result of his work, which was based on a highly positivistic concept of progress, did not go beyond the fourteenth century, and even within that period the humanities occupied an extremely marginal position in Sarton's history. Although he included linguistics and musicology to some extent, he left out other humanistic disciplines such as art history and literary theory. According to Sarton, unlike the study of music, the history of the visual arts (painting, architecture, and sculpture) only throws light upon scholarship from 'the outside' and does not contribute to academic 'progress'.[7] Sarton did not elaborate any further on this issue, but it seems that he was pointing to the history of art *itself* rather than art history as a discipline.

We will see that art history, like literary theory, is an essential component in the history of the humanities. From as early as the third century BCE, Alexandrian scholars tried to shed light on artists' quests for the 'correct' proportions when depicting reality. In the first century CE, Pliny described in detail how classical sculptors kept to exact proportions, for example between the sizes of the head and the body, and Vitruvius reported on the proportions in classical temples. Surprisingly enough, these ratios correspond with the proportions that were found in the study of musical harmony (by Pythagoras, Ptolemy, and others). Similar relationships were discovered in the study of Indian and Chinese art and music (for instance by Bharata Muni and Liu An). We should therefore include the study of music (musicology) and of art (art history) if we want a proper understanding of the historical development of the humanities. Of these two, however, Sarton only addressed musicology, and then primarily because of its importance to scientific progress. Sarton's work is thus not a general history of scholarly disciplines, let alone the humanities. The same can be said of Hans-Joachim Störig's overview

[6] George Sarton, *Introduction to the History of Science*, 3 volumes, Williams and Wilkins, 1931–1947.

[7] Sarton, *Introduction to the History of Science*, volume 1, p. 5.

of the history of science in 1953.[8] Although his work was not based on a positivistic belief in progress, Störig included only linguistics and historiography as humanistic disciplines.[9]

The general history of the humanities has thus remained underexposed in terms of both content and period. This is all the more striking because a large number of histories of science have been written from the nineteenth century onwards.[10] And, more recently, general histories of the social sciences have also been produced.[11] In other words, from a historiographical point of view, a general history of the humanities is conspicuous by its absence. How can this manifest gap in intellectual history be understood? One explanation, which will emerge from this book, is that the humanities have become increasingly fragmented over the last two centuries—unlike the sciences, where the opposite seems to have taken place. Current historiographies of science usually take physics as the central discipline, alongside which other sciences (chemistry, biology, and geology) are discussed and compared. Such an approach is much harder if not impossible to maintain for the history of the humanities. There is no central humanistic discipline on which all other disciplines can be modelled—although we will see in this book that there are common humanistic practices and methodologies. So far, the histories that have been written are almost exclusively of *single* humanistic disciplines, such as histories of linguistics,[12] histories of literary theory,[13] and histories of historiography.[14] Connections between methods and principles among different disciplines have rarely been made. This has led to peculiar situations. For instance, in seventeenth-century England, William Holder wrote both linguistic and musicological works that were interrelated, but he is usually treated as two different people. And during

[8] Hans-Joachim Störig, *Kleine Weltgeschichte der Wissenschaft*, Fischer, 1953.

[9] Additionally there are the great works by Michel Foucault (*The Order of Things,* 1966) and Georges Gusdorf (*Les Sciences humaines et la pensée occidentale*, 1967), but these are more of a philosophical nature, and focus on the social or 'human' sciences rather than on the humanities: linguistics and historiography are included, but no other humanistic disciplines are.

[10] Among the many histories of the natural sciences, one of the first is William Whewell, *History of the Inductive Sciences*, 3 volumes, Parker, 1837. Later classics are Stephen Mason, *A History of the Sciences*, Macmillan, 1962; William Dampier, *A History of Science and Its Relation to Philosophy and Religion*, Cambridge University Press, 1966. Some more recent ones include James McClellan and Harold Dorn, *Science and Technology in World History: An Introduction*, Johns Hopkins University Press, 1999; Frederick Gregory, *Natural Science in Western History*, Wadsworth Publishing, 2007; Patricia Fara, *Science: A Four Thousand Year History*, Oxford University Press, 2009; H. Floris Cohen, *How Modern Science Came into the World*, Amsterdam University Press, 2010.

[11] Examples of histories of the social or human sciences (not be confused with the humanities) are Roger Smith, *The Norton History of the Human Sciences*, W. W. Norton, 1997; Scott Gordon, *The History and Philosophy of Social Science: An Introduction*, Routledge, 1993; Theodore Porter and Dorothy Ross, *The Cambridge History of Science, Volume 7: The Modern Social Sciences*, Cambridge University Press, 2003.

[12] See e.g. R. H. Robins, *A Short History of Linguistics*, Longman, 1997; Esa Itkonen, *Universal History of Linguistics,* John Benjamins, 1991; Pieter Seuren, *Western Linguistics: An Historical Introduction*, Blackwell Publishers, 1998.

[13] See e.g. Richard Harland, *Literary Theory from Plato to Barthes*, Palgrave Macmillan, 1999; Harry Blamires, *A History of Literary Criticism*, Macmillan, 1991.

[14] See e.g. Ernst Breisach, *Historiography: Ancient, Medieval and Modern*, The University of Chicago Press, 2007; Markus Völkel, *Geschichtsschreibung: eine Einführung in globaler Perspektive*, Böhlau Verlag, 2006; Daniel Woolf, *A Global History of History*, Cambridge University Press, 2011.

the Chinese Han Dynasty, Sima Qian developed a narrative scheme that related to both historiography and poetics, yet he is only known as a historian.

This means that a *comparative*, *interdisciplinary* history of these fields is essential. And moreover, we cannot restrict ourselves to one region. It emerges that there is almost nowhere that the history of the humanities can be considered in isolation. Panini's Indian linguistics, for instance, first filtered through to China and Islamic civilization, and after that had profound effects on the study of language in Europe. As far as the discovery of patterns is concerned, historians in Greece (Herodotus and Thucydides), China (Sima Qian), and Africa (Ibn Khaldun) all 'discovered' the constantly recurring historical pattern of rise, peak, and decline. In spite of this, the historiographies of the separate humanistic disciplines are often confined to the Western tradition, with no attempt to unravel the fascinating interactions between the different areas.[15] This book endeavours to reveal this interplay at least to a degree, although a history of the humanities from a global perspective is difficult because many sources are not yet accessible or remain untranslated.[16] I realize that I devote a disproportionate amount of attention to the Western humanities in this book. But besides Europe and the USA I will also deal with the humanities in India, China, Islamic civilization, and Africa, with some excursions to Byzantium and the Ottoman Empire. Any future world history of the humanities should also encompass other regions—from pre-Columbian America to Japan (which I only briefly discuss in chapter 6).

How, though, can we compare the different humanities disciplines not only across periods but also across regions? The contexts of these disciplines, as well as their concepts, can differ endlessly. While it seems problematic to directly compare linguistics, poetics, art theory, musicology, and historiography across regions and periods, we may be able to compare the underlying *methods* used in these disciplines as well as the *patterns* found with these methods. Humanities scholars typically employed one or more *methodological principles* to investigate their humanistic material. And in using these principles they searched for some kinds of *patterns* in the material. These principles and patterns were sometimes literally mentioned while at other times they remained implicit but could often be extracted from the texts. While the contexts of these humanistic studies differ immensely across disciplines, regions, and periods, there appear to be deep commonalities at the level of principles used and patterns found. A comparison between humanistic practices across disciplines, regions, and periods thus seems to be possible in terms of these two concepts.

[15] Even the nine-volume *Cambridge History of Literary Criticism*, Cambridge University Press, 1989–2005, is restricted to Western literary criticism. Not all historical overviews suffer from Western limitation, for example Völkel, *Geschichtsschreibung: eine Einführung in globaler Perspektive*, Woolf, *A Global History of History*, and Itkonen, *Universal History of Linguistics*, aim at a worldwide coverage, albeit for one humanistic discipline only. In the history of the natural sciences, a worldwide perspective is also gaining ground, such as McClellan and Dorn, *Science and Technology in World History: An Introduction*, and Floris Cohen, *How Modern Science Came into the World*, Amsterdam University Press, 2010.

[16] See e.g. Khaled El-Rouayheb, 'Opening the gate of verification: the forgotten Arab-Islamic florescence of the 17th century', *International Journal of Middle East Studies*, 38, 2006, pp. 263–81.

But there is another reason, too, why it makes sense to compare principles and patterns across cultural contexts. On the way, it became crystal clear to me that many of the methods invented in very specific disciplines had been applied by humanists to new problems in other disciplines (often from different periods and regions) *without* taking into account their original religious or cultural contexts. For example, Panini's formal grammar method (see 2.1) originally served the Vedic ritual practice, but when it was (re)discovered in nineteenth-century Europe, his grammar was stripped of its ritual connotations and was used by 'modern' linguists for their own theories of language (see 5.3). A similar thing occurred in the Arab world where the eighth-century *isnad* method of reconstructing the words and deeds of the Prophet (*hadith*) was later used by historians such as Al-Dinawari, Al-Tabari, and Al-Masudi as a successful method for historical source reconstruction without religious connotations (3.2). Their method may even have influenced textual criticism in Renaissance Europe (see 4.1). Thus, the sophisticated source reconstruction that initially had a religious purpose could be applied to non-religious source reconstructions as well, and this was done by scholars themselves. Very specific methods that were developed for solving one particular problem in the humanities in a specific context could be cut loose and reinserted into a different context for solving other, new problems.

The focus on principles and patterns also allows us to discern new patterns *not* found by humanities scholars themselves. These I will call *metapatterns*. For example, it appeared that there was a process from descriptive to prescriptive approaches in all humanistic disciplines in Antiquity. The regularities in Greek tragedies found by Aristotle were quickly turned into prescriptive rules by later poeticists such as Horace (see 2.8 for details). And the mathematical proportions found in classical Greek art and architecture by Pliny and Vitruvius were taken as normative prescriptions by later art theorists (see 2.5, 4.5). The same can be observed in Chinese and Indian poetics and art theory. Surprising enough, this process was reversed at the end of the early modern period—that is, it went from prescriptive back to descriptive again, in Europe and China alike. Another meta-pattern that emerged, is that the time pattern in historical writings from a particular region corresponded with the time pattern used in the canonical texts of that region. This was found in China, Islamic civilization, Europe, Africa (Ethiopia), and India (see 3.2). Thus, by using the concepts of principles and patterns, it is possible to find novel metapatterns across disciplines and even regions. Next, these patterns can be interpreted again in the context of each specific region, and be understood by the cultural products themselves, e.g. the canonical texts of a civilization. But without the concepts of principles and patterns to begin with, it would be hard to find such metapatterns.[17]

[17] My way of working thus differs from Geoffrey Lloyd and Nathan Sivin, *The Way and the Word: Science and Medicine in Early China and Greece*, Yale University Press, 2003, and from Geoffrey Lloyd, *Disciplines in the Making*, Oxford University Press, 2009. These authors do not introduce additional concepts in their cross-cultural comparisons, and consequently find more divergences than common patterns. If we remain too specific, we will not discover commonalities. On the other hand, we should of course make sure that even our most general concepts still remain historically meaningful.

In this book I thus concentrate on the apparently unbroken strand in the humanities that can be identified as *the quest for patterns in humanistic material on the basis of methodical principles*. This strand has not been the only thread in the history of the humanities, but it can be found in all disciplines, periods, and regions. Moreover, it gives my historiography a degree of cohesion alongside which I can also find a place for other approaches that are not searching for patterns. One of the conclusions in chapter 6 will be that there is only a gradual differentiation between the humanities and the sciences, and that there is a continuum in the nature of the patterns and their possible 'exceptions'. The history of the humanities appears to be the missing link in the history of science.

My approach to the history of the humanities challenges a very dominant view in the *philosophy* of the humanities. This view, initiated by Wilhelm Dilthey, contends that the humanities (*Geisteswissenschaften*) are concerned primarily with *verstehen* (understanding), whereas science (*Naturwissenschaften*) is about *erklären* (explaining).[18] According to Dilthey, humanities scholars would be failing if they observed, counted, measured, or hunted for apparent regularities. What they should be doing is searching for the motives and intentions of important historical figures. Laying bare these *inner* mainsprings is more important than studying the *external* manifestations of the human mind. In this context one also uses the distinction introduced by Wilhelm Windelband between an *idiographic* approach to knowledge (which is the study of the unique, the special) and a *nomothetic* way of studying (which seeks to generalize).[19] Although this vision has been very influential in the philosophy of the humanities,[20] it proves to bear less relation to humanistic practice. Even when Dilthey's vision was gaining ground (in the late nineteenth and early twentieth century), there were both idiographic and nomothetic practices in every humanistic discipline, and the latter were often dominant. We have found nomothetic, pattern-seeking components not only in the linguistics of e.g. de Saussure and Jakobson but also in the philology of Lachmann, the musicology of Schenker, the literary theory of Propp, the art history of Wölfflin, and the historiography of the *Annales* school, just to name a few. In spite of Dilthey's and Windelband's constitutive recommendations, there was a boom in efforts to search for and find patterns in the humanities. The fact that the view of the humanities that Dilthey's and Windelband's works represented was nevertheless influential springs primarily from the powerful identity it gave the humanities, which enabled them to differentiate and emancipate themselves from the up-and-coming natural sciences (see chapter 5). This book will, however, show that *the quest for principles and patterns in the humanities is a continuous tradition*. Historiography thus appears to be ideally suited to the refutation of philosophical visions.

[18] Dilthey, *Einleitung in die Geisteswissenschaften*, pp. 29ff.

[19] Wilhelm Windelband, *Geschichte und Naturwissenschaft*, 3rd edition, Heitz, 1904.

[20] See e.g. Gadamer, *Truth and Method*, pp. 6, 56ff. See also the anthology of (abridged) texts in the philosophy of the humanities, in Gauger and Rüther, *Warum die Geisteswissenschaften Zukunft haben!*. And see Gunter Scholz, *Zwischen Wissenschaftsanspruch und Orientierungsbedürfnis: zu Grundlage und Wandel der Geisteswissenschaften*, Suhrkamp, 1991.

Our comparative approach calls for a few further decisions to be made. I have opted for a 'classical' division into periods, namely Antiquity, the Middle Ages, the early modern era, and the modern era. A classification like this is unsatisfactory when I come to describe the humanities in China, India, Islamic civilization, and Africa. I will therefore also refer regularly to periodization within a particular region, for example the dynasties in China. Obviously, any periodization falls short when we want to establish links between civilizations, whether we opt for Chinese dynasties, the Greek Olympiads, or the ages of al-Tabari. Working within the traditional periodization, I address the history of the humanities primarily chronologically and by discipline, but I try to make as many comparisons as possible between disciplines and regions. In so doing I have concentrated more on the internal development of the humanities and less on their external cultural context, although I have tried to integrate these two as much as possible. I have selected a chronological structure rather than a treatment based on themes since it appears that a sequential overview of the humanities is a requirement for recognizing themes that go more across history.[21] We will therefore only reveal the underlying themes as we go along and not specify them beforehand, with one major exception that we meet in all periods and regions—the ongoing search for methodical principles and empirical patterns in humanistic material.

Any intellectual history is faced with a terminological-conceptual problem—which designations can best be used to describe scholarly activities in the past? Can we refer to the study of music and the study of art in the ancient world by using contemporary terms like 'musicology' and 'art history' without lapsing into misleading anachronisms? If we squeeze historical intellectual activities into a straightjacket of present-day expressions, we run the risk of descending into an undesirable kind of 'presentism', in which the past is interpreted in terms of current concepts and perspectives. The preferred starting point is to use contemporary terms for an intellectual activity, for example *poetics* for the study of poetry and theatre in ancient Greece and *grammar* for the study of language. But sometimes these expressions are ambiguous, as is the case with *musica*, which can mean the study of music or the music itself (and more besides). Specific terms are lacking in other cases; for instance in the absence of anything better, the study of art was put under mineralogy and the application of materials in Pliny's *Naturalis historia*. In order to tackle these problems, at least to some extent, in many cases I mention the contemporary or regional designation of the humanistic activity concerned, and then replace it with what I consider to be the most coherent term. On some occasions this is historical (*poetics* for instance) and on others it is current (such as *musicology*). I do not believe that every form of presentism can be avoided—and it does not even need to be always avoided. It emerges that there is greater continuity between the humanities of Antiquity, the Middle Ages, and the modern era than could originally be suspected, both with respect to questions asked, methods used, and patterns found. Such continuity was also remarked upon with regard

[21] See e.g. John Pickstone, *Ways of Knowing: A New History of Science, Technology and Medicine*, Manchester University Press, 2000.

to the development of the natural sciences from the fourteenth century onwards (by Pierre Duhem and others), but it goes even further back in the humanities (see the conclusions of chapters 4 and 5). It is not just that 'humanities' reads and sounds better than the 'study of the products of the human mind' or the like—there also appears to be a historical justification for generalizing the term to cover different periods.[22] Some conceptual anachronisms are not only useful, they are also justifiable.[23]

The various different terms used to describe humanistic activities in regions outside Europe, for example India and China, are another problem. It is precisely for this reason that I will not so much focus on *disciplines*—the latter being a Western concept originating from the medieval universities—but rather on the *study* (or *studies*) of language, literature, art, music, theatre, and the past, which are found in all regions independent of whether these studies were carried out privately or academically, in a religious or in a secular context. It is only for convenience that I often refer to this activity (i.e. the study of language, literature, music or art, etc.) as a 'discipline'.

Thus as a whole, this book is about the history of *the methodological principles that have been developed and the patterns that have been found in the study of humanistic material (texts, languages, literature, music, art, theatre, and the past) with these principles*. The patterns found can consist of a regularity (often with exceptions) but they can also consist of a system of rules such as a grammar, or a system of interpretations, and they may even be similar to 'laws' such as the sound shift laws in linguistics and the laws of harmony in music. My concept of 'patterns' is in fact an umbrella that covers everything that can be found between inexact regularities and exact laws. For the time being I will not make this concept more specific because in my quest I do not want to exclude any 'pattern' in advance. The concept of 'pattern' will gradually crystallize, and will be compared with similar concepts in other sciences and disciplines. (I have given a more detailed description of my working approach in Appendix A.)

At this point it may be important to briefly come back to what this book is *not* about. In my history of the quest for principles and patterns I have not included the social sciences, not even those social sciences that have humanistic aspects, such as (parts of) geography, anthropology, sociology, and psychology. The reason is that there are already excellent books on the general history of the social sciences (see the references in footnote 11). What is missing in the historiography of knowledge is a general history of the humanities, which is exactly what the current work is about. This is not to say that I treat the humanities as a fixed bundle of activities that have remained unchanged since Antiquity. In fact, the study of language, texts, art,

[22] A justification of a generalization of the term humanities (*Geisteswissenschaften*) to other periods can also be found in Helmut Reinalter and Peter Brenner (eds), *Lexicon der Geisteswissenschaften*, Böhlau Verlag, 2011, pp. 258ff. And also in Julie Thompson Klein, *Humanities, Culture and Interdisciplinarity: The Changing American Academy*, SUNY Press, 2005, pp. 13ff.

[23] Cf. David Hull, 'In defense of presentism', *History and Theory*, 18, 1979, pp. 1–15. Nicholas Jardine, 'Uses and abuses of anachronism in the history of the sciences', *History of Science*, 38, 2000, pp. 251–70.

music, literature, rhetoric, and the past has changed dramatically, also under the influence of the upcoming social sciences in the modern era. At various points I will therefore discuss the influences from sociology, anthropology, and psychology on the humanities—from Comte, Weber, Ehrenfels, and Lévi-Strauss to Geertz. But I will not go into the history of these disciplines themselves. A general history of all sciences, i.e. of all knowledge-making disciplines, will have to await its publication.

My decision to focus on principles and patterns will, however, often lead to surprising choices. Many a famous humanist, historian, or philologist will be mentioned only briefly—if at all—while other scholars are dealt with at length. More than once I will describe a well-known work with a single sentence, not because I consider it unimportant or not influential, but because it did not contribute much to the quest for principles and patterns. Of course, another focus would lead to a different history of the humanities. Some humanistic activities will even fall largely outside the scope of my story. We find empirical searches less frequently in philosophy and theology, part of which I therefore do not address. For example, I go into the linguistics of Panini and Apollonius Dyscolus, but the 'language philosophy' of Confucius and Plato gets no more than an honourable mention. The part of theology that is concerned with investigating textual sources will be discussed in some detail, whereas speculative theology will only be mentioned in passing. Having said this, I will often go into the immense impact of theology and philosophy on the humanities, but these disciplines will not receive separate chapters—they simply play a role (almost) everywhere.

My concentration on principles and patterns does not mean that I omit once-only, fortuitous discoveries. Who can leave out from the history of the humanities the archaeological discovery of Troy by Heinrich Schliemann? A more interesting question, however, is whether this discovery was indeed coincidental or whether it was based on methodical principles. Additionally, I will also consider scholars who on the contrary sought to *refute* the concept of patterns—from the Pergamon *anomalists* in the third century BCE to the European *deconstructivists* in the twentieth century. Yet I will argue that seeking and finding patterns is timeless and ubiquitous, not only when observing nature but also when examining texts, art, poetry, theatre, languages, and music. Just as in all other scholarship, it is about trying to make a meaningful distinction between fortuitous and non-fortuitous patterns. Of course the humanities are also concerned with acquiring insights into our culture and its values, and through this, into our own humanity. This book shows that there is also a centuries-old humanistic tradition that seeks principles and patterns while at the same time giving us an understanding of what makes us human. For a long time this tradition was neglected and almost exclusively attributed to science.

My way of approaching the source material is explained in some detail in Appendix A. For the moment it suffices to say that when reading into the history of a certain discipline (of a certain period, region, and civilization), I usually started out with secondary material and worked from there to compare primary sources—which I read in their original languages as far as I could, otherwise in translations. I was surprised how much Chinese, Sanskrit, and Arabic, but also Ge'ez, Russian,

and Turkish material was available in English, French, or German. While many of these sources had already been translated more than a century ago, they had never been brought together, let alone compared. They seemed to have remained in the specialized academic communities. My way of referring to these sources is as follows: if a source—primary or secondary—was not originally in English, I also tried to find an English translation to which I refer in the footnotes.[24] At the same time, I refer to the original source as well but only if I could read it, that is, when it was written in German, Dutch, English, French, Italian, Latin, or Spanish. For texts written in other languages, such as Sanskrit, Arabic, Russian, Chinese, Ge'ez, Fulani, Greek, and Turkish, I had to rely on translations. To verify the reliability of these translations, I consulted Arabists, Indologists, Sinologists, Africanists and other scholars, who also helped me out on a variety of other issues—I acknowledge them on the way and I have gratefully mentioned their names in the Preface.

In sum, in writing an overarching history of the humanities we are confronted with at least four major challenges: the problems of demarcation, of comparativism, presentism, and source selection. There are no straightforward solutions to these problems—if any at all—but we can make motivated choices and see how far we can get. For this book my choices have been the following:

Demarcation. No hard distinction can be made between the humanities, social sciences, and natural sciences. Yet since exactly those disciplines that make up the humanities have been historiographically neglected, we have to investigate their joint history before we can write a general history of science or knowledge.

Comparativism. While it seems problematic to directly compare the study of language, art, literature, music, theatre, and texts—the more if they come from different regions or periods—we can compare them at the level of *methods* used and *patterns* found. We can also do this because humanists themselves often (re)used methods and patterns from different disciplines, periods, and regions in new contexts.

Presentism. Using the present-day meaning of 'humanities' in earlier periods is a conceptual anachronism. But given the continuity between the 'humanities' in Antiquity, Middle Ages, and modern era, this conceptual anachronism is useful rather than harmful.

Source selection. If we want to write an overarching history of the humanities, as well as of other disciplines, it is practically impossible for a scholar to consult all sources in their original languages. We have to work together with other scholars to check the sources and to verify the reliability of translations.

Finally, for anyone who is puzzled by the word 'New' in my book's title, I have used it to contrast my work with previous histories. As I explained above, these previous works focus either on a single humanistic discipline or just on a couple of disciplines. Instead, this book covers eight humanistic disciplines, and several more from the twentieth century onwards. These disciplinary histories are intertwined, but to a certain degree they can also be read independently of one another.

[24] I made an exception for texts by well-known Greek and Latin authors whose English translations can be easily found in the Loeb Classical Library. These texts are quoted without reference to their English translations.

Someone who is only interested in the history of the study of music for instance, can confine themselves to reading the sections on musicology—a field for which no overarching historical overview has so far been written. But anybody who wants to experience the whole adventure of the quest for principles and patterns in the humanities from Antiquity till today will have to read the book from cover to cover. In order to give the reader something to go on, I end every chapter with a comparative conclusion of the period covered. If, after reading this book, someone feels the call to write a different history of the humanities, my objective will have been achieved. As the old Vossius said, 'after me there will be others, and again others, who will do it better than me.'[25]

[25] Gerardus Vossius, *Poeticae institutiones*, Praefatio, in *Opera*, III, 1647 (without page numbers): 'Exsurgent post me alii, et alii, qui felicius conentur.'

2

Antiquity: The Dawn of the 'Humanities'

The humanities came about in a variety of ways—as part of a ritual, as a consequence of philosophy, and sometimes as a political instrument. I discuss the methodical principles that have been developed for each of the humanities and the results (patterns) that have been obtained with these principles. I will moreover address the approaches that, conversely, reject the quest for patterns. More than once we find that there is a surprising correspondence between the humanities in different parts of the world—from China to India to Greece—yet there appears to have been little or no sharing of knowledge.

2.1 LINGUISTICS: THE BIRTH OF GRAMMAR

It is often said that all learning and science began in Greece. Not, though, the study of language. The history of linguistics begins not with Plato or Aristotle, but with the Indian grammarian Panini.[1] Admittedly the first dictionaries go even further back—Mesopotamian clay tablets in the second millennium BCE—and Confucius was philosophizing about language in the sixth century BCE, but the first attempt to systematically describe a language as a whole was made in India by Panini.

Panini and the discovery of grammar. Although Panini is recognized as the father of linguistics, we know virtually nothing about his life, not even in which century he lived. All we know is that he was born in Ghandara, in former India (currently Afghanistan), and that it must have been between the seventh and fifth centuries BCE.[2] His insights did not become known in Europe for over two thousand years, but when they did they changed Western linguistics for ever (see 5.3). What is so special about Panini's work and how does he differ from his Greek contemporaries—who, after all, knew nothing of him?

In his *Ashtadhyayi* ('Eight Books') Panini characterizes a language—in this case Sanskrit—as a system containing a finite number of rules that can be used to describe a potentially *infinite* number of linguistic utterances (sentences).[3] A system like this is currently called a 'grammar'. Panini's Sanskrit grammar might be finite, but it is very big indeed. It comprises 3,959 grammatical rules. Panini's grammar is truly heroic: as far as we know he was the first person to undertake the task of creating a complete system of rules with which it was possible to predict with precision whether or not a sequence of sounds represented a correct linguistic utterance in Sanskrit.[4] Panini's grammar is moreover unsurpassed. After two and a half thousand years, the efficacy of this system of nearly four thousand complex interconnected rules remains undisputed.[5]

Panini was not just a brilliant linguist. The underlying formalism and the method he developed in the *Ashtadhyayi* are just as interesting. Most of us were probably brought up using normative school grammar textbooks that quote a number of hard cases but rarely try to be comprehensive. We probably learned, for example, that *less* should not be used with countable nouns, but that *fewer* should be used instead (i.e. not 'ten items or less' but 'ten items or fewer'). And we were doubtless also taught that in conditional sentences with *if*, the correct form is 'if I had known . . . ', not 'if I would have known . . . '. But interestingly we are never

[1] Panini is also commonly transcribed as Pāṇini, where the accent lies on the first syllable ('Pā').

[2] S. Shukla, 'Panini', *Encyclopedia of Language & Linguistics*, 2nd edition, Elsevier, 2006. See also Paul Kiparsky, 'Paninian Linguistics', *Encyclopedia of Language and Linguistics*, 1st edition, Elsevier, 1993.

[3] For an (abridged) English translation of the *Ashtadhyayi*, with examples and commentaries, see Panini, *The Ashtadhyayi*, translated into English by Srisa Chandra Vasu, Nabu Press 2011 (reprint of 1923). For a German translation, see Otto von Böhtlingk, *Panini's Grammatik*, Buske Helmut Verlag, 1998 (reprint of 1839–40).

[4] Paul Kiparsky, *Panini as a Variationist*, The MIT Press/Poona University Press, 1979. See also George Cardona, *Panini: His Work and its Traditions*, Motilal Banarsidass, 1988.

[5] Esa Itkonen, *Universal History of Linguistics*, John Benjamins, 1991, pp. 83–4.

told about the more obvious cases of English grammar. For example, in English it is sometimes possible to leave out words, a phenomenon known as *ellipsis*. But no school English grammar book tells us that in conjoined sentences we can leave out a verb *only* in the second part of the sentence. So while it is correct to say 'John ate an apple, and Peter a pear', the following is incorrect: 'John an apple, and Peter ate a pear'. Apparently this is so trivial that there is no need to mention it, let alone have a rule for it. But in languages like Japanese and Korean, it is precisely the opposite: verbs can be left out in the first part of a conjoined sentence. This may seem unnatural to native English speakers, but it shows that the phenomenon of ellipsis in conjoined sentences needs to be explicitly addressed. Otherwise a grammar is incomplete, and ungrammatical sentences might not be recognized as such.

In contrast, Panini's approach in the *Ashtadhyayi* was to make his grammar system explicit and comprehensive. He devised a set of rules that, using a combination of a finite number of lexical units (the *word stems*), could cover all correct Sanskrit utterances.[6] Panini invented an ordered system of rules in order to achieve this goal. His rules are applied in a certain order so as to arrive at a linguistic utterance. This corresponds to the concept of an algorithm: a procedure that generates a result in a finite number of sequential steps. Panini's rules are also *optional*,[7] which means there is always more than one possible choice (otherwise it would only be possible to cover one linguistic utterance). He introduced a metarule in order to make his system consistent: 'If two rules conflict, the last rule prevails.'[8] Panini organized his grammar so that this metarule is always valid.

One of the most interesting ideas in Panini's system of rules is that a grammar rule can invoke itself. This is known as *recursion*.[9] Recursion is also known as the *Droste effect* and occurs for instance in an English sentence like 'she was harassed by the individual who was caught by the policeman who was spotted by the photographer'. We can make this sentence longer, as long as we want, by repeatedly applying the same grammatical relative clause rule and (optionally) putting in other words (e.g. by extending the sentence above with 'who was chased by a dog'). In this way Panini could really cover an infinite number of sentences with a finite number of rules and a finite lexicon.

Although we will not go into Sanskrit in any detail, we would like to illustrate the formalism of Panini's grammar. The fundamental productive units of his grammar are the optional rules referred to above, which have the following form: $A \rightarrow B/C\_D$. In effect this means that A can be replaced by B in the context of C and D, where A, B, C, and D are linguistic units that can range from word stems and word categories to whole word groups. In modern linguistics this type of rule is called

[6] Vidyaniwas Misra, *The Descriptive Technique of Panini: An Introduction*, Mouton, 1966, pp. 43ff.

[7] Panini's rule 2.1.11 (*vibhasa*) in the *Ashtadhyayi*. See also Itkonen, *Universal History of Linguistics*, p. 62.

[8] Panini's rule 1.4.2 in the *Ashtadhyayi*. For a discussion about this metarule, see Frits Staal, *Universals: Studies in Indian Logic and Linguistics*, University of Chicago Press, 1988, p. 155. See also Hartmut Scharfe, *Panini's Metalanguage*, American Philosophical Society, 1971.

[9] John Kadvany, 'Positional value and linguistic recursion', *Journal of Indian Philosophy*, 35, 2007, pp. 587–20.

a *context-sensitive* rule (see 5.3) and proves, despite its simplicity, to be powerful enough to describe not just Sanskrit but other languages too. The phenomenon of recursion is achieved if we substitute A for B in the rule stated above, or in other words if A can be replaced by itself ($A \rightarrow A/C\_D$).

However, Panini's grammar does not focus solely on word form and structure (morphology), pronunciation (phonology), and sentence structure (syntax). It also covers meaning (semantics).[10] Like Latin, Sanskrit permits substantial freedom in word order, and so the most information about meaning is contained in the words and their linguistic context. Panini's grammar assigns semantic roles to words that are strung together into more complex parts and ultimately into a meaningful sentence. Panini's grammatical process is a 'mini-play' acted out by an Agent (the leading player) and a number of other roles, such as Goal, Recipient, Instrument, Location, and Source.[11] The finale is an interpretation of the whole sentence.

Since Panini specifies a clear procedure for his grammar, which he expresses as a system of rules, we will designate his method as the *procedural system of rules principle*.

Evaluation of Panini's system of rules. How successful is Panini's grammar? In other words how accurate is his procedural system of rules and can we assess this using the existing corpus of classical Sanskrit? Panini's grammar has indeed been evaluated in detail with the result that (after correction of a few inconsistencies by Panini's followers—see below) so far not one sentence in classical Sanskrit has been found that is not accepted by the grammar. It is moreover the case that similarly no ungrammatical sentences—in so far as these can be created with certainty—are accepted by Panini's grammar. It is more difficult to test whether Panini's grammar also assigns the correct meanings to Sanskrit's grammatical sentences because we cannot find out what these meanings are in all cases from the Sanskrit corpus that has come down to us. As grammar, however, his system of rules is still undisputed.[12] As a counterargument one could contend that classical Sanskrit only exists in the form of a finite corpus, and that consequently Panini's grammar cannot be evaluated in regard to language variation and change. To a degree this is correct. Panini's grammar can only be assessed using the finite surviving corpus of classical Sanskrit. Nevertheless Panini defined extra rules for spoken Sanskrit through which he tried to take language variation into account. Moreover, later Sanskritists extended Panini's system of rules by including new words and forms that were not known in classical Sanskrit (the great Indian grammarian Nagesa was still doing this in the eighteenth century).[13]

[10] Johannes Bronkhorst, 'Panini's view of meaning and its Western counterpart', in Maxim Stamenov (ed.), *Current Advances in Semantic Theory*, John Benjamins, 1992, pp. 455–64. See also S. D. Joshi, 'Sentence structure according to Panini', in G. V. Devasthali (ed.), *Glimpses of Veda and Vyakarana*, Popular Prakashan, 1985.

[11] Kiparsky, 'Paninian Linguistics', *Panini as a Variationist*.

[12] According to Kiparsky, 'Modern linguistics acknowledges it as the most complete generative grammar of any language yet written, and continues to adopt technical ideas from it.'—see Kiparksy, 'Paninian Linguistics', *Panini as a Variationist*. The term 'generative grammar' refers to a system of rules that can generate an unrestricted number of sentences (see 5.3).

[13] Itkonen, *Universal History of Linguistics*, p. 30.

What drove Panini to develop something so unbelievably complicated as a complete Sanskrit grammar? This question is difficult to answer because we know so little about Panini and his predecessors. The *Ashtadhyayi* mentions a number of earlier grammarians, but most of their works have never been found. We do know that there was a tradition of linguistic philosophy in India, with such philosophers as Sakatayana (eighth century BCE) and Yaska (fifth century BCE). For example, Sakatayana asserted that all nouns could be derived etymologically from verbs,[14] and Yaska argued that all complex meanings could be developed from the combination of the meanings of the smallest units (a principle that would later become known as the *principle of compositionality*—see 3.1 and 5.3).[15] The idea that all more complex utterances could be generated using a finite number of units was therefore already in the air, but there was as yet no grammar. However, there arose a need in Hindu India for a strict interpretation of religious Vedic texts (see 2.8), which were memorized and recited with the very greatest accuracy. It is possible that the intellectual origin of Panini's linguistics lies in this Vedic 'learning'.[16] But his grammar concentrates more on the (then) spoken language than the language of the Vedas. It is therefore sometimes asserted that his work was first of all intended to record how to speak Sanskrit 'correctly'. In fact, Panini's grammar was the cornerstone of Brahman education.[17] Pupils were trained from the age of six in memorizing Panini's grammar rules. This was followed by many years of study. But it does not explain what moved Panini to formulate his Sanskrit grammar as an extremely systematic and ordered system of interlinked, recursive rules.

Panini's work had a huge and enduring impact on both linguistics and logic in the Indian world. His grammar generated many schools of linguists which wrote commentaries on commentaries on his grammar, in which they also resolved some inconsistencies and gaps in Panini's system of rules: from Katyayana's explanation in the fourth century BCE and Patanjali's impressive 'Great Commentary' in the second century BCE to the Nyaya school, which based its system of logic on Panini's method (see 2.6).[18] Panini's grammar also produced the model for languages like Tamil and Tibetan, which demonstrated de facto that its rule formalism was not limited to Indo-European Sanskrit. It could also be used to describe other, non-Indo-European languages (see 5.3).

However, it was more than a thousand years before Panini became known outside the Indian world, initially in the seventh century CE by Chinese Buddhist pilgrims who visited India, and then in the eleventh century through the book *Indica* by the Persian scholar al-Biruni, albeit in a very abridged form (see 3.1). It was not until much later, with the advent of nineteenth-century comparative linguistics, that Panini's grammar was also 'discovered' in Europe (see 5.3). The

[14] Bimal Krishna Matilal, *The Word and the World: India's Contribution to the Study of Language*, Oxford University Press, 1990, p. 9.

[15] Eivind Kahrs, *On the Study of Yaska's Nirukta*, Bhandarkar Oriental Research Institute, 2005.

[16] Frits Staal, 'The origin and development of linguistics in India', *Hymes*, 1974, pp. 63–74.

[17] Hartmut Scharfe, *Education in Ancient India*, Brill, 2002, pp. 20ff.

[18] For an overview of these commentaries, see Frits Staal, (ed.), *A Reader on Sanskrit Grammarians*, Motilal Banarasidass, 1985.

classical and Hellenistic Greeks seem never to have known Panini's work—either through Alexander the Great or any other route. They would certainly have appreciated it given their quest for principles. But the Greek philosophers would probably have found Panini's nearly 4,000 rules somewhat on the high side for a compact, axiomatic description of language. However, we now know that no human language exists with fewer rules—there are likely to be more.

Dionysius Thrax's grammar textbook. Compared with Panini, the other linguistics from Antiquity appears to be from a different world. No other work from Chinese, Greek, or Roman literature comes close to Panini's grammar in terms of complexity or precision. However, there was a flourishing linguistic philosophy (which actually comes outside the scope of this history): in the sixth century BCE Confucius was philosophizing about the meaning of names and in the fourth century BCE Plato was contemplating the origin of words and their relationship with reality in the *Cratylos*. This was followed by a study of word categories and word forms by Aristotle at the end of the fourth century BCE, Chrysippus in the third century BCE (see also 2.3) and others. But there was no trace of a descriptive grammar in the form of a system of rules.

The first attempt handed down by the Greeks is a prescriptive grammar textbook by Dionysius Thrax, the *Téchne grammatiké* (first century BCE).[19] There was widespread interest among well-to-do Romans in learning Greek as a second language, and grammar textbooks satisfied this need. Dionysius defines linguistics as 'practical knowledge of the elements of a language as used by poets and prose writers'. This definition reveals that his goal was very different from Panini's. Dionysius Thrax and other Western grammarians had a practical, educational goal—to teach Greek on the basis of normative instructions. Panini, on the other hand, wanted to design a procedural grammar based on formal and complete rules, but it could not be used to learn Sanskrit as a foreign language.

Dionysius's slim school grammar, which runs scarcely thirty pages, was used for centuries as a textbook. Dionysius concentrates on correct pronunciation, stress, punctuation, the alphabet, syllables, nouns, verbs, articles, prepositions, adverbs, and conjunctions in order to arrive ultimately at an overview of the different metres. His grammatical terminology was used in all European grammars until the end of the eighteenth century,[20] but Dionysius's grammar barely goes beyond a description of the conjugations and declensions. Syntax or word order is almost completely ignored. However, others attempted to describe the 'natural word order' of Greek. They included Dionysius of Halicarnassus (end of the first century BCE), but later he refuted the eight rules he had proposed on the basis of examples from Homer (see 2.8, Poetics).

Apollonius Dyscolus's sentence structure and the Roman tradition. We see a profound interest in Greek *syntax* for the first time in the work of Apollonius

[19] J. Alan Kemp, 'The Tekhne Grammatike of Dionysius Thrax translated into English', *Historiographia Linguistica*, 13(2/3), 1986, pp. 343–63.

[20] On the influence of Dionysius's grammar, see Pieter Seuren, *Western Linguistics: An Historical Introduction*, Blackwell Publishers, 1998, p. 22.

Dyscolus (second century CE), although his analysis remains largely based on the Aristotelian concepts of subject and predicate. Apollonius's most important innovations were (1) an analysis of the argument structure of the verb, and (2) an extension towards the idea of syntactic agreement in terms of number and gender, as it exists between article and possessive pronoun in Greek.[21] Apollonius also describes the complex Greek case system, and he remarks—and expresses surprise—that the subject sometimes has the first (nominative) case but can also have the fourth (accusative) case if it is construed with an infinitive. However, Apollonius does not give the underlying rule for this phenomenon; he addresses it on the basis of a number of examples. His grammar is consequently partially *example based*: if no rules are found, the linguistic phenomena are discussed using examples without making generalizations about those examples. It is indeed not always possible to generalize about linguistic phenomena. The existence of idiosyncratic and idiomatic expressions (for example, 'by and large' and 'long time no see') represents the standard example for a lack of rules. But Apollonius also uses examples where there could well be an underlying rule, but he did not find it.

Apollonius's attempt aside, virtually no classical linguist tackled the challenge of using a rule-based grammar to describe the capricious syntax and semantics of the Greek language. Although Apollonius's son Aelius Herodian (*c.*180–250) developed a system of rules for the simpler problem of accentuation,[22] the Greeks soon appeared to realize that a system of rules for syntax or word order could not be created from a small number of axioms or principles. Incidentally, we will see in 2.5 that the musicologist Aristoxenus undertook the construction of a grammar of Greek melodies, but his results have had little impact outside musicology.

Grammars in the tradition of Dionysius Thrax and Apollonius Dyscolus were also developed for Latin, for example by Varro, Donatus, and Priscian.[23] Varro (first century BCE) put the emphasis primarily on formal (syntactic) categories and Donatus and Priscian on functional (semantic) categories. Donatus's *Ars minor* and *Ars maior* (fourth century CE) became the most widely used educational works in the first half of the Middle Ages, until Priscian's *Institutiones grammaticae* (sixth century CE) was rediscovered in the Carolingian Renaissance. Although Priscian introduced the idea of a rule (*regula*) for describing the declension of nouns, his grammar is largely concerned with word structure and similarly does not go into syntax and (sentence) semantics. Western linguistics continued to be dominated by the taxonomic study of words after Priscian, and this situation did not change until the later Middle Ages (see 3.1).

Humanities or science? Panini's grammar is 'one of the greatest monuments of human intelligence'.[24] The only work from Antiquity that is comparable in originality and scope is *The Elements*—the axiomatic analysis of geometry by the

[21] Fred Householder, *The Syntax of Apollonius Dyscolus*, John Benjamins, 1981, p. 2. See also David Blank, *Ancient Philosophy and Grammar: The Syntax of Apollonius Dyscolus*, Scholars Press, 1982.
[22] Augstus Lentz, *Herodiani technici reliquiae*, Olms, 1965 (reprint of 1867–70).
[23] Vivian Law, *The History of Linguistics in Europe*, Cambridge University Press, 2003, pp. 42ff.
[24] Leonard Bloomfield, *Language*, University of Chicago Press, 1984 (reprint of 1933), p. 11.

Hellenistic mathematician Euclid in the third century BCE. In both cases a finite number of rules are used to cover an infinite number of possible expressions, where Euclid's work is concerned with expressions in mathematical language and Panini's in human language. Yet Panini's grammar is language-specific: it addresses only Sanskrit. This gives rise to the question of how *general* Panini's formalism of context-sensitive grammar is. Can we also describe other languages with this kind of grammar? That is, is it universal or specific? As we have seen, Panini's formalism was also used to describe the Tamil and Tibetan languages, but we do not encounter any notion of 'Universal Grammar' until the work of Roger Bacon in the thirteenth century (3.1). This idea was worked out in greater depth in the seventeenth century, and a pinnacle was reached in the twentieth century by Noam Chomsky, who contended that a Universal Grammar is innate (5.3). Meanwhile we have learned that Panini's formalism of a context-sensitive grammar can indeed be used for describing many, and perhaps all, human languages. His formalism even served in the twentieth century as the basis for the first high-level programming languages, such as ALGOL60, which also work on the basis of a fully specified system of rules (see chapter 6).[25] Virtually all programming languages are written in a formalism that uses Panini's linguistic notion of a grammar. Such a grammar can determine whether a given sequence of statements forms a correct expression in the particular programming language or not.[26]

But if the nature of Panini's system of rules is so formal, can his grammar still be considered as a product of the humanities? Should it not rather be regarded as a scientific study of language? Putting it another way, is Panini's grammar representative of the humanities? Definitions of the humanities and science are of no help to us here. There was no differentiation between these forms of knowledge in the eras of Panini and Euclid. We will see that over the centuries, but primarily from the nineteenth century on, linguistics used an increasingly formal approach. But more importantly, its subject is the study of human language, which is a pre-eminent expression of the human mind. As such linguistics is taught in all humanities faculties worldwide. No matter how one looks at it, Panini is the father of linguistics, not mathematics.

[25] P. Z. Ingerman, 'Panini-Backus form suggested', *Communications of the ACM*, 10(3), 1967, p. 137.

[26] On the relation between Panini's linguistics and computer science, see also Rens Bod, 'Discoveries in the humanities that changed the world', *Annuario 53, 2011–2012*, Unione Internazionale degli Istituti di Archeologia, Storia e Storia dell'Arte in Roma, 2011, pp. 189–200.

2.2 HISTORIOGRAPHY: THE SOURCE PROBLEM AND THE FORM OF THE PAST

How do we understand our past? Historiography emerged independently in different places around the world, but when exactly did it begin? This question is a tough one to answer because myth and historiography are so often intertwined (myths can contain social truths but they do not amount to historical writing).[27] For example, in his *Theogony* and *Works and Days* the Greek Hesiod (*c.*700 BCE) describes a world history of gods, heroes, and mortals in five ages: the golden age, the silver age, the bronze age, the heroic age, and the iron age. It is a story of growing chaos and misery, but historiography it is not. The Chinese *Book of Documents* dating from the sixth century BCE may be the oldest historical source book that has been handed down, the compilation of which is attributed to Confucius. In fifty-eight chapters it tells of the words and deeds of illustrious rulers, starting with the legendary emperors Yao and Shun, followed by the emperors of the Xia, Shang, and Zhou dynasties.[28] It is beautiful prose, describing a succession of extravagant, benevolent, wise, and murderous rulers, but is it historiography? It makes sense to let the history of historical writing begin with Herodotus's *Histories* (440 BCE).

Herodotus and Thucydides: the cyclical pattern of rise, peak, and decline. As far as we know, Herodotus was the first historian to collect his material systematically and test its accuracy in some way. This practice was the beginning of historiography as a 'principle-based activity'. Can we talk about historiography at all without a test of the reliability or accuracy of sources? That would mean having to assume that every report and every source is true, even contradicting sources, which would be logically impossible. Thus Herodotus subjected his material to a rudimentary form of critical analysis. Rather than trusting (verbal) sources from his immediate environment, he travelled around the then known world in an attempt to get as close as possible to the 'source' relating to his main subject: the Persian Wars (490, 480–479 BCE). If Herodotus was not sure about a source or if sources contradicted one another, he analysed them all and then selected the one he considered to be the *most probable*. He was not afraid to voice his own opinion in this process. Because of the subjectivity of this method Herodotus was accused by later historians (including Claudius Aelianus in *Varia Historia, c.*200 CE) of embellishing or even distorting sources. As a consequence, Herodotus acquired the dubious reputation of being both the 'father of history' and the 'father of lies'.[29]

Current opinion about Herodotus is considerably kinder: we know that objectivity in historiography is an unattainable ideal, and that Herodotus's method, while it was far from perfect, did at least include a critical component. We will designate

[27] Percy Cohen, 'Theories of myth', *Man: Journal of the Royal Anthropological Institute*, 4(3), 1969, pp. 337–53.

[28] James Legge, *The Chinese Classics, Volume III: The Shoo King or the Book of Historical Documents*, Trubner, 1865.

[29] Detlev Fehling, *Herodotus and His 'Sources': Citation, Invention, and Narrative Art*, Arca Classical and Medieval Texts, Papers, and Monographs 21, Francis Cairns, 1989.

his principle as the *most probable source principle*. Although one could ask oneself whether such a subjective rule deserves the word 'principle', Herodotus had to rely much more on oral sources than later historians. Whereas we only have the *result* of the work of many other scholars (such as Panini's Sanskrit grammar), Herodotus also describes *how* he used his principle.[30] On Egypt, for instance, he said: 'So far the Egyptians themselves have been my authority, but in what follows I will describe what others are also inclined to accept about the history of this country, and I shall add something of what I myself have seen.'[31] And: 'With regard to this point I feel it necessary to give an opinion that I know will be contradicted by most people. Nevertheless, since I believe it to be correct I will not suppress it',[32] after which he selects the source he considers to be the most probable. This principle gave Herodotus a licence to choose the source that he thought of highly—but not until he had compared and evaluated the other sources. Moreover, he used his principle in a principled manner, for instance when he wrote: 'The third opinion is by far the most plausible, yet the most erroneous of all. It has no more truth in it than the others.'[33]

Why did Herodotus look for an explicit method based on a critical principle? We should keep in mind that Herodotus's historiography was competing with the 'many tales' of the Greeks,[34] in particular the Homeric epic and its illustrious heroic deeds, which people learned at their mothers' knees. Oral traditions like these enjoyed huge authority, and only a fundamental method that was also based on oral tradition could legitimize a form of written history. Herodotus's goal was therefore the same as that of the Homeric bard: keeping alive remembrance of the past, in which the standards of propriety were set down.

The greatest historian immediately after Herodotus was Thucydides, whose description of the Peloponnesian Wars (431–404 BCE) tolerated no second-hand or third-hand sources, but *eyewitness accounts* only. He distrusted every source that was not based on direct evidence.[35] Thucydides had a good point here of course, but unlike Herodotus he could describe a history of events whose eyewitnesses, including himself, were still alive. Thucydides had another point. Because he wanted to base his work on the *eyewitness account principle* he rejected the ethnographical and geographical descriptions that are abundant in Herodotus. The broad cultural approach was lost on Thucydides, and he stressed time and again that the historiographer should concentrate on the history of the *lives of people*—no more and also no less. This is exemplified to perfection in his famous funeral oration for Pericles. Although Thucydides has (had) a better reputation than Herodotus,[36] he

[30] On Herodotus's way of working, see also Ernst Breisach, *Historiography: Ancient, Medieval and Modern*, University of Chicago Press, 2007, p. 19.
[31] Herodotus, *Histories*, 2.147.
[32] Herodotus, *Histories*, 7.139.
[33] Herodotus, *Histories*, 2.21.
[34] On this issue, see D. H. Fowler, 'Herodotus and his contemporaries', *Journal of Hellenic Studies* 116, 1996, pp. 62–87. See also G. E. R. Lloyd, *Disciplines in the Making: Cross-Cultural Perspectives on Elites, Learning, and Innovation*, Oxford University Press, 2009, p. 67.
[35] Thucydides, *History of the Peloponnesian War*, 1.21.
[36] Clifford Orwin, *The Humanity of Thucydides*, Princeton University Press, 1994.

offered no solution to the problem of conflicting sources for which Herodotus had devised a heuristic, no matter how subjective it was. Thucydides's stories moreover lack a precise indication of time, but to a lesser extent than the chronological vacuum found in Herodotus.

Despite these shortcomings, both historians applied their historical principles with vigour, and this transformed historiography from uncritical storytelling into a critical activity. As well as writing a description of the Persian and Peloponnesian Wars, Herodotus and Thucydides also 'discovered' something remarkable. They both believed they had recognized a *cyclical pattern in history*. Herodotus's history, for instance, reflected a repeating pattern of rise, peak and decline. We see this pattern in his descriptions of both people and states, for example the tyrant Pisistratus and Athens, King Croesus and Lydia, and Darius and Persia: their fortunes rose and fell. Herodotus considered the cyclical pattern to be the basic structure of history: 'For many states that were once great have now become small, and in my lifetime those that are great used to be small.'[37]

Thucydides also contended that the rise and fall of Athens and its disintegration during the Peloponnesian Wars had parallels with other historical periods, and believed that the cyclical pattern was analogous to human nature and therefore could even serve as an 'aid for interpreting the future'.[38] This vision of the future, present, and past as an eternal cyclical pattern can of course also be found in the works of the Pythagoreans, Anaximander, Parmenides, and Plato (*Timaeus*), as well as in the Greek tragedies.[39] The new element in Herodotus and Thucydides is that they believed to have recognized these cyclical patterns on the basis of their methodical principles. Herodotus found the pattern in the lifes of people and states through source comparison, while Thucydides found the cyclical pattern through eyewitness accounts.

Alongside the cyclical model, Herodotus also found a cultural pattern. After he had compared the Persians, Greeks, and Callatians he felt he was able to conclude that *all peoples believe their own way of life is the best*: 'Assume that we let all people select the very best laws and customs from all over the world. After careful consideration they would all choose their own laws and customs, because they are all convinced that their own way of life is the best one.'[40] Thus Herodotus also conceived the concept of cultural relativism.[41]

Berossus, Manetho, Timaeus: chronology and the written source principle. Who came after Herodotus and Thucydides? After the Peloponnesian Wars the Greek world of the *polis* (city-state) produced no new historical methods or principles. Some historians wrote in the broad Herodotean manner, like Ephorus of Cyme who produced a compilation of all Greek history, by some referred to as

[37] Herodotus, *Histories*, 1.5.
[38] Thucydides, *History of the Peloponnesian War*, 1.22.
[39] For an overview, see David Bebbington, *Patterns in History*, Regent College Publishing, 1990.
[40] Herodotus, *Histories*, 3.38.
[41] Siep Stuurman, *De uitvinding van de mensheid: korte wereldgeschiedenis van het denken over gelijkheid en cultuurverschil*, Prometheus, 2009, p. 160.

the first universal history.[42] But most historians in the early fourth century BCE applied Thucydides's approach, such as Xenophon who wrote the impressive *Anabasis*, a record of the expedition against the Persians and the journey home, which was later used by Alexander the Great (356–323 BCE) as a field guide. Even in the time of Alexander there were no great historians of the stature of Herodotus or Thucydides. Yet a new genre of biography emerged and a long tradition of descriptions of India was initiated by Megasthenes's *Indica* (*c*.300 BCE). These too, though, were based on Thucydides's eyewitness account principle.

The most important historiographies during Hellenism were outside Greece, for example a history of Mesopotamia by Berossus and a history of Egypt by Manetho, both in the third century BCE. It is here that we see a *chronological organization* of the material. Whereas Berossus appears to use a random chronology in his *Babyloniaca*, Manetho's *Aegyptiaca* contains a meticulous arrangement of Egyptian royal dynasties based on lists of kings. Many such lists have survived, such as the *Annals of the Old Kingdom* and the *Turin Papyrus of Kings.* However, it is not known which lists of kings Manetho used.[43] He was, though, one of the first Hellenistic historians to work on the basis of written sources, so we can describe his method as the *written source principle.* Manetho's work was used later as a written source for the Jewish history of Flavius Josephus (first century CE) and in Christian chronicles, such as those by Eusebius (fourth century CE). We will see how Manetho's lists of kings led to the early modern crisis in the Christian world view, after their accurate reconstruction by Joseph Scaliger in the sixteenth century (see 4.2).

The preoccupation with chronological organization can also be seen in the historians of *Magna Graecia* in southern Italy. Take for example the description by Timaeus of Tauromenium ('Taormina') around 300 BCE of the creation of Rome and Carthage. He calculated that Carthage was established in 814–813 BCE. To do this Timaeus used the Olympiads as units of time and also a list of winners of the Pythian Games (which had already been drawn up by Aristotle). This made it possible to synchronize different historiographies. Timaeus's chronological time scale was generally adopted by other scholars, and even by the astronomer and geographer Eratosthenes.[44]

Early Roman historiography and Polybius's personal experience principle. Roman historiographers are viewed as rarely showing significant originality. Most historiographers contend that the Romans adopted Greek ideas about historical theory and combined them with Timaeus's chronological innovations.[45] And indeed the first histories of Rome were written in Greek both by Romans such as Fabius Pictor and by Greeks, for instance Polybius. Like Thucydides, Polybius assumed in his *Histories* (200 BCE) that the most reliable sources were accounts by *eyewitnesses*, or at least had to be based on *personal experience*. He had no access to

[42] Polybius, *Histories*, 33.2.

[43] Gerald Verbrugghe and John Wickersham, *Berossos and Manetho, Introduced and Translated: Native Traditions in Ancient Mesopotamia and Egypt*, University of Michigan Press, 1996.

[44] For the wonderful life of Timaeus, see Truesdell Brown, *Timaeus of Tauromenium*, University of California Press, 1958.

[45] See e.g. Stephen Usher, *Historians of Greece and Rome*, Duckworth Publishers, 2001.