

CAMBRIDGE GALEN TRANSLATIONS

# GALEN

## Works on Human Nature

Volume 1

*Mixtures (De Temperamentis)*



P. N. Singer and  
Philip J. van der Eijk

with the assistance of  
Piero Tassinari

CAMBRIDGE



# GALEN: WORKS ON HUMAN NATURE

## Volume I

### *Mixtures (De Temperamentis)*

*Mixtures* is of central importance for Galen's views on the human body. It presents his influential typology of the human organism according to nine mixtures (or 'temperaments') of hot, cold, dry and wet. It also develops Galen's ideal of the 'well-tempered' person, whose perfect balance ensures excellent performance both physically and psychologically. *Mixtures* teaches the aspiring doctor how to assess the patient's mixture by training one's sense of touch and by a sophisticated use of diagnostic indicators. It presents a therapeutic regime based on the interaction between foods, drinks, drugs and the body's mixture. *Mixtures* is a work of natural philosophy as well as medicine. It acknowledges Aristotle's profound influence while engaging with Hippocratic ideas on health and nutrition, and with Stoic, Pneumatist and Peripatetic physics. It appears here in a new translation, with generous annotation, introduction and glossaries elucidating the argument and setting the work in its intellectual context.

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CAMBRIDGE GALEN TRANSLATIONS

General editor: Philip J. van der Eijk

Galen's works represent one of the most impressive monuments of Classical medicine. They dominated medical theory, teaching and practice in the medieval European and Islamic worlds and remained a key source of medical wisdom down to the twentieth century. But his works also concern themselves with all the philosophical issues involved in understanding the human body, soul and health, and in diagnosing and treating illness, and Plato and Aristotle were key influences on his thought. Furthermore, as the court physician of several Roman emperors, Galen is an important source of information about social and cultural life in the early Empire.

*Cambridge Galen Translations* provides a co-ordinated series of scholarly English translations of works of Galen in a unified format with substantial introduction and annotation, glossaries and indices. Many of the translations have been newly commissioned, while others are revised versions of good translations which have for some time been out of print. Editors and translators are drawn from the world's leading scholars of Galen and of ancient medicine. The series is intended both to contribute to international Galenic scholarship and to make Galen's work more easily accessible for a wider, non-specialist readership including historians and philosophers of science and readers with a medical background.

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# GALEN: WORKS ON HUMAN NATURE

Volume I  
*Mixtures (De Temperamentis)*

TRANSLATED WITH INTRODUCTION  
AND NOTES BY

P. N. SINGER AND PHILIP J. VAN DER EIJK

WITH THE ASSISTANCE OF  
PIERO TASSINARI



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The *doruphoros* (spearthrower) of Polyclitus, referred to by Galen in *Mixtures* I.9, 36,16–17 H. (I.566 K.)

(Photo: Abgusssammlung antiker Plastik, Freie Universität Berlin)

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The passage from *Mixtures* I.9, 36,14–21 H. (I.566 K.) as transmitted in the manuscript Laurentianus 74.5, fol. 28v

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## *Series editor's preface*

The works of Galen of Pergamum (129–c. 215 CE), ‘the Prince of Physicians’, constitute one of the most impressive monuments of classical medicine. They comprise all areas of medical theory and practice, ranging from anatomy, physiology, pathology, diagnosis and prognosis, dietetics and regimen in health, therapeutics, pharmacology and surgery, gynaecology, embryology and theory of reproduction to psychiatry and ethics. In addition, they cover philosophical and methodological aspects fundamental to the acquisition, systematization and communication of medical knowledge, such as logic, terminology, epistemology, philosophy of nature and theory of causation. And however voluminous and wide-ranging, they are bound together by an intrinsic and coherent (if eclectic) comprehensive theory of the human body, the human psyche, their place within the natural world, the nature of medical knowledge and the technical and ethical components of medical expertise.

Galen’s works were of enormous influence on the subsequent history of medicine and science, both in the West and in the East (and in Arabic medicine), and Galen’s authority remained powerful until well into the seventeenth century and, in some respects, beyond that. Yet, more recently, Galen’s works have also found strong resonance beyond the domain of medical history. Galen was, after all, not only a brilliant doctor and prolific writer but also the court physician of several Roman emperors, a keen public debater and dissector and an active participant in social and cultural life, first in Pergamum and subsequently in Rome. It is therefore not surprising that Galen’s work commands a rapidly growing interest from classicists, ancient historians and students of Greek and Roman literature, philosophy and society; and his writings are being exploited as a rich source for the social, cultural and intellectual history of the early Imperial period.

Yet Galen’s works are difficult to access. Many are available only in old editions that do not meet current standards of classical scholarship, such as the nineteenth century edition by Carl Gottlob Kühn (Greek text with

Latin translation), which is still the most recent edition aspiring to completeness but which is universally regarded as unsatisfactory – and, in spite of its title *Opera omnia*, it lacks a number of Galenic works preserved in Latin or Arabic adaptation or deemed lost but later discovered (such as the recently found *Avoiding Distress*). For only a handful of Galenic texts have the basic modern philological requirements of a critical edition with translation and commentary been fulfilled; and although Galenic scholarship of the last decades has seen significant improvement, it is still the case that large parts of Galen's work are not available in English translation. While interest in Galen thus seems greater than ever before, the language skills required to read him in the original are becoming more and more scarce.

The Cambridge Galen Translations series aims to address this need. The purpose of the series is to provide a co-ordinated series of scholarly English translations of works of Galen in a uniform format consisting of introduction, translation, explicative notes, glossaries and indices. The series has been planned in close co-ordination with other ongoing Galen projects, such as the *Corpus Medicorum Graecorum* (CMG) at the Berlin-Brandenburg Academy of Sciences,<sup>1</sup> the Galen volumes in the Budé series published by Les Belles Lettres (Paris),<sup>2</sup> and those in the Loeb Classical Library published by Harvard University Press,<sup>3</sup> in order to minimize duplication and, where possible, to promote international collaboration. Indeed, the translations in the present volume and in those to follow are based on critical editions that have been published, or are being prepared for publication, in the CMG, or Belles Lettres, or in some cases by other publishers (such as, for the present volume, the Teubner series).

Yet the novelty of the project lies not only in its provision of English translations. It also aims to make a new contribution to international

<sup>1</sup> A list of works published in the CMG (which was founded in 1907) and of works in preparation can be found on the CMG website at <http://cmg.bbaw.de/Startseite.html>

<sup>2</sup> See J. Jouanna and V. Boudon, 'Présentation du projet d'édition de Galien dans la Collection des Universités de France', *Bulletin de l'Association Guillaume Budé* 1993, pp. 101–135. So far, eight volumes have been published: *Ars medica/Protrepticus* (Boudon, 2000), *De ossibus ad tirones/De dissectione musculorum* (Garofalo and Debru, 2005), *De libris propriis/De ordine librorum suorum/Quod optimus medicus* (Boudon-Millot, 2007), *De dissectione nervorum/De dissectione venarum et arteriarum* (Garofalo and Debru, 2008), *Introductio seu medicus* (Petit, 2009), *De indolentia* (Boudon-Millot, Jouanna and Pietrobelli, 2010), *De alimentorum facultatibus* (Wilkins, 2013) and *De theriaca ad Pisonem* (Boudon-Millot, 2016).

<sup>3</sup> So far, eight Galenic works have been published: *De naturalibus facultatibus* (Brock, 1916), *De methodo medendi* (Johnston and Horsley, 3 vols., 2011), *De constitutione artis medicativae, De methodo medendi ad Glauconem, Ars medica* (Johnston, 2016), *De sanitate tuenda, De parvae pilae exercitio* and *Thrasylbulus* (Johnston, 2018).

Galenic scholarship, especially through substantial introductions, notes and glossaries, which are intended to provide resources for the study of Galenic language and thought, and indeed for Greek medical terminology at large. In this regard, the format of the series is closely modelled on Richard Sorabji's *Ancient Commentators on Aristotle* (now published by Bloomsbury), from which it has drawn most of its inspiration, and on the CUP series of translations of Proclus' *Commentary on Plato's Timaeus*. Moreover, the project is meant to open up Galen's work to other disciplines beyond Classics and History of Medicine, such as the History of Philosophy, the History and Philosophy of Science, Cultural History, Linguistics and Literary Studies, and to readers with a medical background.

Galen's work is vast, and the series will therefore, in the first instance, give priority to works that have not yet been translated into English (or indeed in any modern language), or to works for which an English translation exists which, however, is out of print,<sup>4</sup> or in need of revision or replacement in the light of recent developments in Galenic scholarship. A further consideration in the planning of the series has been the interest of the texts to be included and their relevance to some of the major issues that Galen's work raises.

Thus the text translated in the present volume, *Mixtures*, is of central importance for Galen's views on the human body, on methods of feeling and reading the body and on understanding and managing the body's interaction with food, drinks, drugs and the environment. It is also an illuminating testimony to Galen's Aristotelianism. Yet it has never received a detailed analysis, let alone a commentary. Initially, our plan was to publish *Mixtures* together with Galen's *Commentary on Hippocrates' Nature of the Human Being* and with his *Commentary on the Medical Statements in Plato's Timaeus*. For practical reasons, we have now decided to publish *Mixtures* first in a separate volume; the other two works will follow in a second volume, which will also include a translation of Galen's *Compendium of Plato's Timaeus*, thus combining three 'meta-texts' devoted to Galen's two chief authorities in medicine and philosophy, Hippocrates and Plato.

Further volumes to follow in the series will testify to Galen's views on the nature and methodology of medical prognosis and prediction (*Commentary on Hippocrates' Prognostic*); on the preservation of health and the promotion of a healthy style of living (*Matters of Health*); on the structure and

<sup>4</sup> E.g. P. N. Singer's *Galen: Selected Works*, Oxford 1997; translations of a number of Galenic texts included there are revised, with extensive new introductions and notes, for the present series.

purposive arrangement of the human body (*The Function of the Parts of the Human Body*); and on the theory and therapeutic practice of simple medicines (*Simple Medicines I–V*). All these works also provide insight in the ways in which Galen arrived at his views and tried to justify them, how he accommodated and appropriated the various intellectual traditions, both medical and philosophical, to which he was indebted, and how successful he was in his attempts to create a synthesis out of these often conflicting tendencies. Furthermore, they will give a lively picture of the social and cultural environment in which Galen lived and how it impinged on the formation and development of his ideas; and finally, they will be illuminating for Galen's activities as a writer and communicator, for the ways in which he presented his ideas, the consistency of his terminology, the audiences for whom he wrote, the genres he used to disseminate his ideas and the rhetorical strategies he employed to persuade his readers and to distinguish himself from rival doctors with whom he was in constant competition.

It is a pleasure to acknowledge the generous financial support of the Wellcome Trust through a History of Medicine Programme Grant, which has allowed the appointment, at Newcastle University, of three designated academic staff for the first six years of the project. We are very grateful to Newcastle University for its institutional support during these years. We gladly acknowledge the support of the Alexander von Humboldt Foundation, the Deutsche Forschungsgemeinschaft and the Humboldt University, which have ensured the continuation of the project, and provided additional funding, after my move to Berlin. For the practical organization of the project, we would like to thank Cambridge University Press, and in particular its Classics Editor Michael Sharp, who have supported the idea right from the start and have been a patient source of help throughout the production of the volumes in the series .

Philip J. van der Eijk  
*Berlin, November 2017*

## *Preface and acknowledgements*

The translation printed here is essentially the work of P. N. Singer, the introduction of Philip J. van der Eijk, while the notes represent input from both of us. But we have revised each other's work and the result is throughout a joint production. Work on the translation started as a revision of Singer's version in the Oxford World's Classics volume *Galen: Selected Works* (1997), but in the process, a significant number of major and minor changes were made so that the result is in essence a new translation.

The translation is based on the critical edition of the Greek text by G. Helmreich (1904, revised and updated by S. Besslich, 1969);<sup>1</sup> any departures from this edition are listed below on p. 185 and discussed in the notes. We are aware that Helmreich used only a selection of the manuscripts and that his critical apparatus is not always as accurate or clear as would be desirable. We have taken account of the *addenda et corrigenda* to Helmreich's edition provided by R. Durling in his edition (1976) of the medieval Latin translation by Burgundio of Pisa, which we have also consulted. We have further taken account of the Arabic translation by Ḥunayn ibn Ishāq, which was kindly made available to us by Ivan Garofalo, and the 1521 Latin translation by Thomas Linacre.

We have benefited greatly from the assistance of Piero Tassinari, who created the Greek–English Index as well as the List of Galen's works, and who provided numerous valuable comments and suggestions on the translation and the notes. His Italian translation of *Mixtures and Elements according to Hippocrates* (1997) was of great help to us in preparing our English version. Very sadly, a few months before this manuscript was sent to the Press, Piero died after a period of illness. We acknowledge with

<sup>1</sup> Accessible online via the Corpus Medicorum Graecorum website of the Berlin Brandenburg Academy of Sciences at [http://cmg.bbaw.de/epubl/online/wa\\_galen\\_temp.php](http://cmg.bbaw.de/epubl/online/wa_galen_temp.php)

profound gratitude his contribution to the Cambridge Galen Translations, and to scholarship on ancient medicine at large.

We are grateful for the comments and feedback we received on drafts of various parts of the translation from the participants of the weekly meetings of the Galen reading group held at the Institut für Klassische Philologie of the Humboldt Universität zu Berlin as part of the Alexander von Humboldt project ‘Medicine of the Mind, Philosophy of the Body. Discourses of Health and Well Being in the Ancient World’, and at two designated workshops held in Berlin in 2010 and 2011. Preliminary results of our work were presented at conferences and seminars at the Institute of Classical Studies in London, the Philosophy Faculty at the University of Oxford, the University of Exeter, the Universität Trier, the Université de Strasbourg, the Universität Bamberg, the University of Oslo, the University of Geneva, the University of Palermo, the Université de Nantes, Corpus Christi College Oxford, the Max Planck Institute for the History of Science, Princeton University, the Istituto Orientale Napoli, the Ludwig-Maximilians-Universität München, the Universität Erlangen, Sechenow First Moscow State University, the University of Utrecht, the Universität Mainz and the University of Tokyo, and we are grateful to the audiences present on these occasions for their comments, suggestions and questions. In particular, we would like to thank Vincent Barras, Sean Coughlin, Armelle Debru, Klaus-Dietrich Fischer, Ivan Garofalo, Christopher Gill, Jim Hankinson, Matyáš Havrda, David E. H. Jones, Inna Kupreeva, Orly Lewis, Geoffrey Lloyd, Vito Lorusso, Daniela Manetti, Matteo Martelli, Claudia Mirrione, Vivian Nutton, Lorenzo Perilli, Jackie Pigeaud, André-Louis Rey, Amneris Roselli, Julius Rocca, Christine Salazar, Mark Schiefsky, Conrad Schiffner, Heinrich von Staden, John Wilkins and Roland Wittwer.

Selected quotations from the translation and parts of the Introduction were published earlier in [van der Eijk \(2013a\)](#), [\(2014a\)](#) and [\(2015\)](#), and we are grateful to De Gruyter and to the Institute of Classical Studies for permission to reuse this material (with slight alterations in the case of the translation, and in abbreviated form in the case of the Introduction).

For technical support in the final preparation of the copy, proofs and indexes, we are grateful to Evangelia Nikoloudakis, Dorothea Keller and Martin Müller.

We acknowledge the financial support of the Wellcome Trust, the Alexander von Humboldt Foundation and the Deutsche Forschungsgemeinschaft, and the institutional support of Newcastle



University, the Humboldt Universität zu Berlin and Birkbeck College, University of London.

Finally, we would like to thank Iveta Adams for her meticulous, patient and thoughtful copy-editing.

P. N. Singer and Philip J. van der Eijk  
*London and Berlin, November 2017*

## *Note on citations and abbreviations*

Titles of works of ancient authors, if given in full in a discursive context, are usually translated. For precise references in footnotes, the standard abbreviations of the *Greek–English Lexicon* of Liddell, Scott and Jones (LSJ) are used, with a few exceptions for more familiar authors or works. However, works by Galen are cited in the form given in the List of titles and abbreviations of Galen’s works at the end of the book.

All references to Galenic works are by chapter number, or, where applicable, book and chapter number, followed by page and line number (separated by a comma) of the most recent critical edition, the editor’s name (sometimes in abbreviated form), and then in parentheses the volume and page number of the older edition of Kühn (K.), where this is available. The full list of Galenic titles in abbreviated form, along with full title in Latin and English, and the abbreviations for editors’ names, is to be found in the List of titles and abbreviations of Galen’s works. Typical references would thus be: *Hipp. Elem.* 2, 64,1 DL (I.420 K.); *Nat. Fac.* I.2, 103,18–105,9 H. (II.4–6 K.) Similarly, all quotations from the works attributed to Hippocrates are identified by the Littré (L.) volume and page numbers as well as those of the most recent critical edition.

Throughout the actual text translated in this volume, references to the Kühn page numbers (K.) are printed in the left-hand margin. References to page and line numbers of Helmreich’s edition (H.), which is used as the basis for the translation, are printed in the right-hand margin. The traditional division of the text into chapters has also been retained. The titles of the chapters are provided by the translators. The following is a list of the most common abbreviations used throughout the volume (for individual publications, full titles are given in the Bibliography):

<i>ANRW</i>	<i>Aufstieg und Niedergang der römischen Welt</i> (= Haase and Temporini (1972–))
<i>CMG</i>	<i>Corpus Medicorum Graecorum</i>
DK	Diels and Kranz (1952, repr. 1961)
FSHG	Fortenbaugh <i>et al.</i> (1992)
K.	Kühn (1821–1833)
KRS	Kirk, Raven and Schofield (1983)
L.	Littré (1839–1861)
LS	Long and Sedley (1987)
LSJ	Liddell, Scott and Jones (1996)
<i>SVF</i>	von Arnim (1903–1905)



## *Introduction*

### **The importance of *Mixtures***

*Mixtures* is a work of central importance for Galen's views on the human (and the animal) body. It sets out his theory of the four elementary qualities hot, cold, dry and wet and their fundamental role in the natural constitution and functioning of the human organism. It also develops his influential typology of people according to the nine mixtures or 'temperaments', and his ideal of the 'well-mixed' or 'well-tempered' person, whose perfect balance ensures excellent performance both in the physical and the psychological domain.

*Mixtures* further teaches the aspiring doctor how to assess the patient's bodily mixture by training one's sense of touch and by means of a sophisticated use of diagnostic indicators. It also sets out a therapeutic regime based on the interaction between the elementary qualities of foods, drinks and drugs and the mixture of the human body.

Thus *Mixtures* occupies a key position in Galen's natural philosophy, physiology, pathology, pharmacology and therapeutics. In thought as well as style, the work is profoundly influenced by Aristotle, whom it acknowledges as the great philosopher. It also responds to earlier medical ideas on good and bad mixture, health and nutrition, both Hippocratic and Pneumatist, and it engages with Stoic and Peripatetic physics.

*Mixtures* appears here in a new translation, with substantial annotation and introduction elucidating the argument and setting the work in its intellectual context, and with extensive glossaries and indices providing a detailed insight into Galen's medico-philosophical vocabulary and conceptual apparatus.

### **Date of composition and place in Galen's oeuvre**

*Mixtures* (Greek *Peri kraseōn*, Latin *De temperamentis* or *De complexionibus*) was written during Galen's second period in Rome, between 169 and 176

CE.<sup>1</sup> It thus belongs to the same time frame as some of Galen's other central works, such as the later books of *The Doctrines of Hippocrates and Plato (PHP)*, *The Function of the Parts of the Human Body (UP)* and *Natural Capacities (Nat. Fac.)*. In terms of its systematic position within Galen's oeuvre, Galen himself refers to *Mixtures* on numerous occasions elsewhere in his writings, and he often presents the work as being of fundamental importance to the understanding of his more specialized writings on therapeutics, pharmacology and pathology. The text has an emphatically didactic style, and it seems to have been envisaged as a central component of the 'curriculum' that a student of Galen's works would have had to go through prior to embarking on his medical magnum opus, *The Therapeutic Method*. In the reading order outlined in Galen's autobiographical work *My Own Books*, *Mixtures I–II* is said to follow *Elements according to Hippocrates*, but to precede either *Mixtures III* and *Simplex* (in what is evidently a more pharmacological curriculum), or if one prefers to omit those works, *The Best Constitution of our Bodies, Good Condition, The Uneven Bad-Mixture, The Distinct Types of Disease* (plus the following *Causes of Diseases*), *The Distinct Types of Symptom* (plus *Causes of Symptoms*), *Affected Places* and a range of other works, ending with *The Art of Medicine* (with which *Mixtures*, especially [book II](#), shows a number of striking parallels).<sup>2</sup>

The reason for this centrality of *Mixtures* lies in its importance as a work of natural philosophy, medical diagnostics, therapeutics and (theoretical) pharmacology. The concept of mixture plays a crucial role in all these areas. For Galen's concept of mixture goes further than just the belief that within our bodies there are mixtures of elementary components that influence, to a considerable extent, our state of health, well-being and flourishing – which, as we will see below, was a widespread opinion among Graeco-Roman medical and philosophical writers. Galen goes far beyond this idea and holds mixtures to be the key to the understanding, maintenance and treatment of the human body. He says that it is the mixture of hot, cold, dry and wet that constitutes the nature of a living being;<sup>3</sup> and he holds the mixtures causally responsible for a large number of bodily and also psychological (and ethical) features of human beings and animals, both generically and on the level of individual variations. Indeed, as Galen

<sup>1</sup> For an overview of Galen's life and the dating of his writings see [Singer \(2013\)](#) 1–4 and 34–41, which takes account of the earlier scholarship on the chronology of Galen's works (e.g. [Ilberg 1889–1897](#)); see also [Boudon-Millot \(2007\)](#), Introduction; [Hankinson \(2008d\)](#); [Singer \(2018b\)](#).

<sup>2</sup> *Lib. Prop.* 6, 155,13–156,24 [Boudon-Millot](#); *Ord. Lib. Prop.* 2, 93,18–95,4 [Boudon-Millot](#).

<sup>3</sup> *Temp.* III.4, 104,1–3 H. (1.675 K.).

famously and notoriously argues in a number of places in his *œuvre*, it is the *mixtures* of the body – rather than the body as a whole – on which the ‘capacities of the soul’ (thinking, perception, memory, voluntary motion, emotions) are said to depend.<sup>4</sup> Thus for Galen it is the body’s mixture – rather than, say, the body’s anatomical structure, specific bodily organs or internal substances such as blood or *pneuma* – in which a large part of the individual nature and peculiarity of a living being finds its cause and origin.<sup>5</sup> Furthermore, mixtures admit, at least to a considerable extent, of management and manipulation, and in this regard they are different from other features of the human body such as anatomical structures, which are largely fixed and beyond human influence. All this explains why Galen believes that a correct theoretical understanding of mixtures and their distinct types, the practical diagnostic skill of accurately assessing an individual body’s mixture by reference to these distinct types, and the therapeutic ability to manage and, if necessary, correct the mixture and keep it in a good state, are so fundamental.

*Mixtures*’ aims may therefore be summarized as follows: to provide essential teaching about the fundamental levels of organic life and its variations, as constituted by the mixtures and their different types; to train the medical student in methods of acquiring knowledge of the body’s condition, both empirically and theoretically, as constituted by these distinct types of mixture; and to teach the student how to apply that knowledge in the management and treatment of individual bodies, especially through foods, drinks and drugs.

In addition, the work touches on the psychological side of human life, for it refers to the correspondence between physiological states and moral and cognitive performance, as manifest in character traits and intelligence. It even refers, on a few occasions, to the divine and its influence on the formation of the human body.

Thus *Mixtures* presents a remarkably wide-ranging perspective on Galen’s views of the nature of human beings, on what they have in common with other living things and in what ways they are different, on their place in the universe, their specific ‘job’ or characteristic activity, and their relation to the divine. It further represents the body–soul relationship

<sup>4</sup> This is the subject matter of the treatise usually referred to by its Latin title *Quod animi mores corporis temperamentis sequantur* (*QAM*), ‘That the capacities (*dunameis*) of the soul depend on the mixtures (*kraseis*) of the body’; see Singer (2013) 333–423.

<sup>5</sup> ‘A large part’, for Galen recognizes that some features of the human body are not due to the mixtures but to what he calls nature’s ‘shaping capacity’ (*diaplastikē dunamis*), or ‘according to the original plan’ (*kata prōton logon*); see below, p. 135 n. 137 and van der Eijk (2014a) 120–123.

as an organic, teleological connection: mixtures are instruments in the hands of nature that give rise to psychological capacities and character states, while, conversely, the latter presuppose the presence of appropriate bodily mixtures in order to be activated and physically implemented. This is a natural and purposive arrangement, provided by nature in the teleological sense of the word. Yet human responsibility has a role to play as well, if necessary assisted by medical expertise, in managing this relationship and keeping it in good condition.

In this latter regard, *Mixtures* also has an ethical, normative aspect to it, describing human nature as it ideally should be, as it is appropriate for it to be, a standard that all individual humans should aspire to. This normative tone manifests itself, for example, in Galen's belief that humans are by nature at the centre of the universe in terms of being most 'well-mixed' of all existing living things, and that the good-mixture of the human body constitutes the central norm and standard against which all other mixtures need to be assessed. It also explains Galen's sustained concern with the question which human being within the human species has the best mixture.<sup>6</sup>

*Mixtures* further considers variations between living beings, including animals and plants, in terms of higher and lower degrees of perfection and healthiness, variations that are determined by differing degrees and proportions of the elementary qualities hot, cold, dry and wet. It also addresses individual – or at any rate sub-specific, typological – variations between members of one and the same species, in particular between human individuals, both physically and psychologically. Thus, although the work is, essentially, a treatise of natural philosophy, physics or biology – since it encompasses all living bodies, including animals and plants – its anthropocentric point of view makes it in practice a work of human physiology. Moreover, it is not only concerned with physical description but also with practical instruction as to how to discern or assess bodily mixture and how to act on this, and therefore it is at the same time also a medical work, or at least a work that doctors (or aspiring doctors) will need as a guide to medical practice.

For the Galen scholar, *Mixtures* is an illuminating source of information about his views on the constitution of the body, on the nature of human beings and on the physical basis of their psychology. It is also an informative work for Galen's teleology and its relationship to the more technical, mechanical sides of Galen's physiology (and pathology); for while

<sup>6</sup> *Temp.* I.9, 35,18–19 H. (I.565 K.).



predominantly concerned with the fundamental, basic levels of physical organization, it explicitly addresses the question to what extent human nature, including the rational soul, is just a matter of a careful balance of elementary properties or whether there is, in addition to this, a higher, indeed divine, element that is responsible for the structural shaping of the human organism.

*Mixtures* is also a most informative testimony for Galen's epistemology, as it sets out a detailed account of the methods by which bodily mixtures are to be discerned, both through empirical observation and through indirect reasoning on the basis of inference from signs. Thus the work is a rich source of information for Galen's views about the relation between reason and experience. Furthermore, [book III](#) of *Mixtures* provides, in a way, the theoretical foundation of Galen's dietetics and pharmacology and thus constitutes, together with the first five books of *Simple Medicines (SMT)*, the elemental foundation of his therapeutics by means of foods, drinks and drugs. In this regard, *Mixtures* is also a major source of information about Galen's pharmacology and 'chemistry'.

Finally, *Mixtures* provides an impressive testimony to Galen's Aristotelianism, in thought as well as style. No other Galenic work is so overtly appreciative of Aristotle's ideas, and the methodology and style of the investigation show strong similarities with the Aristotelian *pragmateia*.

### Contents, scope and subject matter

Galen's concept of mixture (*krasis*) is set out in the first book of the work. It refers to the proportional relationship between the elementary qualities hot, cold, dry and wet in the bodies of living beings. Mixtures are states of the body, and of parts of the body, constituted by the proportion between the four elementary qualities hot, cold, dry and wet. These qualities inhere, first of all, in 'extreme' or 'absolute' form in the primary elements (*stoicheia*) of bodies, i.e. earth, water, fire and air, but also, in a relational sense and in combination with each other, in the higher levels of bodily organization, such as the four fundamental fluids (*chumoi*, traditionally translated 'humours') of the human body, i.e. blood, phlegm, yellow bile and black bile, as well as the bodily parts (*moría*), both the homoeomerous or uniform parts (*homoioimerē*) and the heterogeneous (*anhomoioimerē*) or organic (*organika*) parts.<sup>7</sup> All of these are characterized by a certain mixture of hot, cold, dry and wet.

<sup>7</sup> Galen's theory here represents a combination of ideas derived from natural philosophy, especially Aristotle, and the medical treatise *The Nature of the Human Being* attributed to Hippocrates, to

Thus in terms of contents, the work's subject matter is situated between that treated in *Elements according to Hippocrates*, which it is said to follow,<sup>8</sup> and which deals with the most basic level of elemental organization of bodies,<sup>9</sup> and, on the other hand, the level of the fluids, the homoeomerous or uniform and the organic parts as discussed in the *Commentary on Hippocrates' Nature of the Human Being and Natural Capacities*.<sup>10</sup> According to Galen, the bodies of living beings can be described in terms of an ascending scale of elements, elementary qualities, fluids, uniform parts and heterogeneous parts. Embedded in these structures are the various capacities or faculties (*dunameis*), such as the natural faculties of attraction, retention, assimilation, expulsion, and various other activities such as nutrition, respiration and pulsation, in which the various different kinds of *pneuma* (vital, psychic and, perhaps, natural *pneuma*) are involved as well; and on top of this physical basis, and deriving from it, are the various capacities of the soul.<sup>11</sup>

In addition, Galen also uses the word 'mixture' in relation to the environment and the seasons with which the body interacts, e.g. in his discussion of the seasons in *Temp.* I.2–3, and in relation to the dietetic and pharmacological substances that act on the body's mixture in nutrition and in medical treatment, which are discussed in [book III](#). These, too, are characterized by mixtures of the elementary qualities.

From this very wide range of application, it becomes clear that in Galen the word 'mixture' (*krasis*)<sup>12</sup> refers not so much to a physical or chemical 'mix' of substances (such as a cake or a soup to which one might add

which he devoted a substantial commentary. In the [first book](#) of this commentary, he sets out in detail his views on the hierarchy of the elementary composition of living bodies.

<sup>8</sup> *Temp.* I.1, 1,6–7 H. (I.509 K.).

<sup>9</sup> A critical edition with English translation and commentary of this work was provided by De Lacy (1996); for recent discussions of some of its most salient ideas see [Kupreeva \(2014\)](#) and the collection of papers edited by [Guyomarc'h and Marchand \(2017\)](#).

<sup>10</sup> For the former work see [n. 7](#) above; an English translation of this commentary with introduction and notes (by R. J. Hankinson) is in preparation for the Cambridge Galen Translations. *Natural Capacities* is available in an English translation in the Loeb Classical Library (by [A. Brock, 1916](#)), and in German, French, Italian and Spanish translations (see the List of Galenic works below, pp. 186–199).

<sup>11</sup> For an overall account of Galen's views on elementary physiology see [Hankinson \(2008c\)](#). On the question as to whether Galen really adopted the notion of 'natural *pneuma*' (*pneuma phusikon*) that is often attributed to him in the later tradition see [Singer \(forthcoming a\)](#) and [Rocca \(2003\)](#); see also [Sharples and van der Eijk \(2008\)](#) 145 n. 731 on Galen's distinction between capacities that are vital (*zōtikai*) and those that are natural (*phusikai*).

<sup>12</sup> *Krasis* derives from the verb *kevanunai*, 'mix' or 'combine', and in the literal sense of the term in its earliest instantiation, it is used e.g. for mixing wine (with water), concocting a potion, etc. On the etymology and history of the term and its relationship to *mixis* and *meignunai* see [Mirrione \(2017\)](#) 240–297.

ingredients and whose texture one might influence by stirring, kneading or boiling) but rather to the underlying proportion, ratio or formula according to which the relevant components are structured and related to each other – a proportion constituted, as stated, by the four elementary qualities hot, cold, dry and wet.<sup>13</sup> In this respect, Galen follows an earlier tradition of medical, philosophical and also musical texts from the fifth century BCE onwards, in which *krasis* is used in this more abstract sense.<sup>14</sup> This proportion will vary from one genus or species of living things to another, and it can also vary between individual members within a species, or even within one individual at different stages of his or her physical development or simultaneously between the different parts of his or her body.

Galen characterizes mixtures as *hexeis*, ‘states’ or ‘conditions’,<sup>15</sup> so evidently they have a certain degree of stability. Yet they are not immune to change, for during an individual being’s early years the mixture is in a state of flux and development before getting settled, and it continues to change with age (*San. Tu.* I.5); and mixtures can be influenced by food, drink, drugs and lifestyle in general, as Galen will point out in [book III](#), which is devoted to the role of mixtures in dietetics and pharmacology. On the other hand, mixtures are not just incidental, episodic physiological states that change all the time, for if they were, it would not be possible to characterize individuals by reference to their mixtures or to infer someone’s mixture on the basis of someone’s long-term external physical features (which is what Galen does in [book II](#)).

Galen further distinguishes between connate (*sumphutoi*) mixtures and those that have been acquired (*epiktētoi*) as a result of long-term habituation.<sup>16</sup> We may gather from this that every human being is born

<sup>13</sup> Thus the mixtures that Galen regards as fundamental to the natural constitution of living bodies are in the first instance mixtures of elementary qualities, not of the elements themselves nor, as is often believed, of the humours – although Galen occasionally also talks of mixtures in this latter sense, e.g. the *melancholikai kraseis* mentioned in *Temp.* II.6, 83,4 H. (I.641 K.); *Loc. Aff.* III.10 (VIII.183 K.); *Alim. Fac.* III.1.3 (180,20–21 Wilkins, VI.661 K.); *SMT* I.33 (XI.438 K.); and *HVA* IV.63, 327,20 H. (XV.843 K.). On this point see also [Moreno Rodriguez \(1991\)](#). Nor is Galen’s concept of mixture, as the later Latin translation *temperamentum* suggests, to be identified with ‘temperament’ in the psychological sense of character type or personality, for this is a post-Galenic, early medieval development of the theory of constitution types: see [Klibansky, Panofsky and Saxl \(1964\)](#) and [\(1992\)](#).

<sup>14</sup> For an account of the use of *krasis* in philosophical discussions of the soul–body relationship (e.g. in Alexander of Aphrodisias), see [Singer \(2013\)](#) 359–365. For discussions of Galen’s concept of *krasis* against the background of Greek semantics and of medico-philosophical usage see [den Dulk \(1934\)](#); [Tracy \(1969\)](#); [Montanari \(1979\)](#); [Schwabe \(1980\)](#); [Boudon-Millot \(2011\)](#); [Needham \(2012\)](#); [Mirrione \(2017\)](#).

<sup>15</sup> *Temp.* I.8, 31,20 H. (I.558 K.) and II.4, 60,10 H. (I.604 K.). What follows here in the next paragraphs is adopted, in abbreviated form, from [van der Eijk \(2014a\)](#).

<sup>16</sup> *Temp.* II.4, 60,6–21 H. (I.604–605 K.).

with a certain mixture<sup>17</sup> that is subject to change as a result of a particular lifestyle (or, possibly, as a result of dietetic and pharmacological treatment). Galen's references to the physiology of Egyptians, Arabs and Ethiopians suggest that there is a hereditary side to the mixtures as well,<sup>18</sup> although this can also be a matter of climate, habitat and environment, or a combination of both, for example the latter becoming part of people's 'genetic' make-up.<sup>19</sup>

Not only bodies as a whole, but also bodily parts have a mixture. And there can be variation between a state in which the mixture is consistent throughout the body (*homalos*) and a state in which the body is disproportionate in its mixture (*anōmalos*) in some way or another.<sup>20</sup>

The next step in Galen's theory is the establishment of nine 'distinct types' (*diaphorai*) of mixture. These are, so to speak, the regular patterns that can be discerned within the potentially infinite variation of degrees between the combinations of the four qualities. The identification of these nine distinct types is the chief purpose of the first book. After a lengthy polemical discussion with other thinkers (from ch. I.2 onwards), Galen states his own theory (ch. I.8). The various possible combinations of hot and dry, hot and wet, cold and dry, and cold and wet, yield, to begin with, four simple mixtures. To say, for example, that a body is hot means that hot dominates or predominates, where 'predominate' refers either to a situation in which one quality predominates over others in a given mixture, or to a situation in which a quality in one body is in excess compared to that in another body, or to a situation in which a quality is in excess compared to a norm or standard that applies to the specific kind of living beings the individual belongs to.<sup>21</sup> In addition to these four simple mixtures, Galen further recognizes four composite mixtures: mixtures that are hot and dry, hot and wet, cold and dry, or cold and wet, and where both qualities predominate, i.e. are in excess in the three senses just described. Thus a body may be said to have a hot and wet mixture when its degrees of hotness and dryness are in excess compared to the other qualities, or to those of another body with which it is compared, or compared to a certain norm or standard; and likewise for the other three combinations.<sup>22</sup> Galen labels all these eight distinct types 'bad-mixture' (*duskrasia*), i.e. they

<sup>17</sup> This can be gathered from *Temp.* II.2, 43,17–44,7 H. (I.577–578 K.).

<sup>18</sup> *Temp.* II.4, 67,27 H. (I.616 K.); 68,18–19 H. (I.618 K.); 69,2 H. (I.618 K.).

<sup>19</sup> *Temp.* II.6, 74,7–75,2 H. (I.628 K.).

<sup>20</sup> This is the subject matter of the work *The Uneven Bad-Mixture (Inaeq. Int.)*, which is referred to in *Temp.* II.6, 85,15–16 H. (I.645 K.).

<sup>21</sup> Cf. *Temp.* I.6, 21,10–19 H. (I.542 K.).      <sup>22</sup> Cf. *Temp.* I.8, 31,3–11 H. (I.557–558 K.).

constitute a state of imbalance – although, as we will see shortly, they do not necessarily constitute a state of ill health or disease. Finally, Galen posits a ninth type of mixture, i.e. the state of good-mixture (*eukrasia*), in which the elementary qualities are all present to the mutual extent that is exactly appropriate to the species in question, as expressed by the standard that applies to that specific kind of living beings.<sup>23</sup>

Here, the normative, teleological aspect of Galen's mixture theory becomes manifest, as does the relevance of the mixtures, what they do and why are they so important. For Galen, and for Greek physical thought at large, the qualities hot, cold, dry and wet, whose proportion constitutes the mixture, are not just passive qualities but also active forces that exercise a particular effect – heating, cooling, drying or moistening – on the bodily structures in which they inhere and on the functions or activities carried out by these bodily structures. For example, the mixture of the brain has to be in good condition in order for the brain to exercise its characteristic activities such as cognition and locomotion; or the stomach and the blood vessels require a good, appropriate mixture for the exercise of nutrition and digestion. Therefore, the mixtures have to be in the right state in order to facilitate the appropriate physical mechanisms and in order for them to operate smoothly. All being well, this goodness or appropriateness is provided and enabled by nature, but there is also a role to play for human management: mixtures are accessible to therapeutic intervention and correction, which may be needed when the mixture departs from its norm as a result of disease or an unhealthy lifestyle.

Thus mixtures are effective in giving rise to specific physiological and also psychological capacities and in promoting their performance. In terms of health and disease, the one good-mixture and the eight bad-mixtures are to be understood as points on a scale: health and disease admit of degrees, Galen explains, and these express themselves in higher or lower levels of performance of physical and psychological capacities.<sup>24</sup> Thus it is not that all human beings with a 'bad-mixture' necessarily suffer from some kind of ill health, for we only speak of disease when the specific capacity of a bodily part is damaged to such an extent that it is impaired in its functioning, and when this is accompanied by a sense of pain, as Galen argues elsewhere (*San. Tu.* I.2–5). Yet one may presume that people with a bad-mixture are more susceptible to ill health and disease as a result of their constitution.

As we can see, Galen's mixture theory, as his theory of health at large, is performance-related: good-mixture is that which facilitates good activity

<sup>23</sup> *Temp.* I.8, 31,17–32,4 H. (I.558–559 K.).      <sup>24</sup> *Temp.* II.4, 63,3–19 H. (I.609–610 K.).