

**The Expanding Body:
Anatomical Vocabulary and its Dissemination in Classical Athens**

by

Tyson Sukava

B.A., University of Manitoba, 2004

M.A., University of Manitoba, 2007

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Abstract

This dissertation examines (1) the contributions that classical Greek medical writers made to preexisting anatomical vocabulary; and (2) how, why, and to what extent these terms were appropriated by non-medical authors. The project's broad scope, including investigations into anatomical terms in the Homeric epics and in classical drama and prose, is intended to build upon previous studies of Greek medical vocabulary and its dissemination in the classical period. This approach authorizes a better sense of medical influences upon classical Greek thought and, more specifically, of how physicians' novel notions about the body were received by other intellectual elites. Therefore, this dissertation also contributes to our understanding of the conceptual negotiations that occur when a society is exposed to the new ideas of a specific intellectual group.

The study begins with a contextualization of its aims and methodology within broader investigations into cultural and medical constructions of the body. Chapter 2 examines anatomical terminology in the Homeric epics to provide a baseline for the state of later Greek anatomical vocabulary. Chapter 3 provides an analysis of classical Greek medical approaches to the body through a study of medical treatises contained within the Hippocratic Corpus. This chapter further identifies specific terms apparently created by physicians to record and relate their detailed observations of the body.

Following a discussion of the general public's interests in medical thought in Athens (chapter 4), the remaining chapters examine evidence for the broader dissemination of medical anatomical terms. Emphasis is placed on the plays of Sophocles, Euripides, and Aristophanes (chapters 5 and 6), and on the prose writings of Herodotus, Thucydides, Xenophon, and Plato (chapter 7) as representative authors who are educated but not medical professionals. The

dissertation concludes with a list of anatomical terms used in archaic and classical Greek writings (Appendix 1). From this study, it emerges that medical anatomical vocabulary, and more generally medical models of the body, were received with a blend of fascination, anxiety, and suspicion. The appropriation of medical terms by lay-writers suggests the educated elite's increasing familiarity with medical ideas during the late 5th and early 4th centuries BCE.

Preface

This dissertation is original, independent, and unpublished work by the author, T. Sukava.

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List of Abbreviations

Abbreviations for classical authors and their works follow H.G. Liddell and R. Scott. 1996. *A Greek-English Lexicon* (9th ed.). Clarendon Press. xvi-xxxviii. Unless otherwise stated, abbreviations for modern works follow S. Hornblower, A. Spawforth, and E. Eidinow (eds.). 2012. *The Oxford Classical Dictionary* (4th ed.). Oxford University Press. xxix-liv.

Abbreviations for regularly cited editions and reference works:

Austin	Austin, C. 1973. <i>Comicorum Graecorum fragmenta in papyris reperta</i> . de Gruyter.
Beekes	Beekes, R. 2009. <i>Etymological Dictionary of Greek</i> . Brill. 2 vols.
Chantraine	Chantraine, P. 1968-80. <i>Dictionnaire étymologique de la langue grecque: Histoire des mots</i> . Éditions Klincksieck. 4 vols.
DK	Diels, H., revised by W. Kranz. 1952. <i>Die Fragmente der Vorsokratiker</i> (6 th ed.). Weidmann. 2 vols.
Frisk	Frisk, H. 1960. <i>Griechisches etymologisches Wörterbuch</i> . C. Winter. 3 vols.
K	Kühn, C.G. 1821-30. <i>Claudii Galeni opera omnia</i> . Knobloch. 19 vols.
K.-A.	Kassel, R. and C. Austin. 1983-2007. <i>Poetae Comici Graeci</i> . de Gruyter. 8 vols.
LSJ	Liddell, H.G. and R. Scott. 1996. <i>A Greek-English Lexicon</i> (9 th ed. with supplement). Clarendon Press.
Nauck	Nauck, A. 1889. <i>Tragicorum Graecorum fragmenta</i> . Teubner.
OED	Simpson, J.A. and E.S.C. Weiner. 1989. <i>The Oxford English Dictionary</i> (2 nd ed.). Oxford University Press. 20 vols.
Radt	Radt, S. 1977 and 1985. <i>Tragicorum Graecorum fragmenta, Vol. 3-4</i> . Vandenhoeck & Ruprecht.
Snell	Snell, B. 1971 <i>Tragicorum Graecorum fragmenta, Vol. 1</i> . Vandenhoeck & Ruprecht.
Wharton	Wharton, E.R. 1882. <i>Etyma Graeca: An Etymology of Classical Greek</i> . Rivingtons.

Abbreviations and estimated composition dates of relevant Hippocratic works:*

Specialist Works:

- Acut.*** *Regimen in Acute Diseases* (II 224-377)
Date: end of the 5th century BCE (Jouanna 1999: 410); *ca.* 410 BCE (Lonie 1963: 79)
- Coac.*** *Coan Prenotions* (V 588-733)
Date: no earlier than the end of the 4th century BCE (Jouanna 1999: 379); *ca.* 410 BCE (Jones 1923b: xxix)
- Epid.*** *Epidemics 1, 3* (II 598-717)
Date: around 410 BCE (Jouanna 1999: 388); so Langholf 1990: 77
Epidemics 2, 4, 6 (II 43-197)
Date: a collection of case histories gathered during the first quarter of the 4th century BCE (Jouanna 1999: 389); proposed dates have ranged from 427-373 BCE (Langholf 1990: 77)
Epidemics 5, 7 (VIII 512-519)
Date: internal evidence places the works between 358/7 BCE and 348 BCE (Jouanna 1999: 390)
- Fist.*** *Fistulas* (VI 446-461)
Date: 4th century BCE (Jouanna 1999: 391; Tottlelin 2009: 15)
- Fract. / Art.*** *Fractures / Joints* (III 338-563)
Date: end of 5th / beginning of 4th century BCE (Jouanna 1999: 403). Both works (parts of a single treatise) seem to have been well-known by the 4th century (Withington 1927: 85)
- Haem.*** *Haemorrhoids* (VI 434-445)
Date: 4th century BCE (Jouanna 1999: 393)
- Int.*** *Internal Affections* (VII 166-303)
Date: 490s BCE (Jouanna 1999: 395)
- Mochl.*** *Instruments of Reduction* (IV 328-95)
Date: mid-4th century BCE (Jouanna 1999: 398)
- Morb.*** *Diseases I* (VI 138-205)
Date: 380s BCE (Jouanna 1999: 382)

* The volume and page numbers in brackets following each work's title refer to the standard Littré editions of the Hippocratic Corpus (1839-61), which are used in this dissertation. I have omitted some works assigned to the classical period because of their low content of anatomical vocabulary. The dating of individual Hippocratic treatises is an extremely difficult task (see Jones 1923a: xxxi-xxxii for a useful overview of the problem), and all dates provided should be considered estimates (with the exception of *Epid.* 5 and 7). See the introduction of chapter 3 below for further discussion.

Diseases 2 (VII 1-115)

Date: 5th century BCE material, although it likely contains later additions (Jouanna 1999: 383); Langholf 1990: 3-4 has observed that some sections of the treatise appear to predate *Epid.* 1 and 3

Mul. *Diseases of Women 1-2* (VIII 1-463)

Date: *Diseases of Women 1*, late 5th or early 4th century BCE; *Diseases of Women 2*, perhaps mid-5th century BCE with later additions in the 4th century (Jouanna 1999: 386)

Nat. Mul. *Nature of Women* (VII 310-431)

Date: likely ancient material (contains passages with close similarities to *Diseases of Women*), although perhaps edited at a later date (Jouanna 1999: 400-401); see also Totelin 2009: 9-13, who assigns its material to the 5th or 4th centuries BCE

Prog. *Prognostics* (II 110-191)

Date: second half of 5th century BCE (Jouanna 1999: 406); *ca.* 415 BCE (Jones 1923b: xxix); *ca.* 410 BCE (Alexanderson 1963: 23)

Prorrh. *Prorrhetic 1* (IX 510-573)

Date: mid-5th century BCE (Jouanna 1999: 407); *ca.* 440 BCE (Jones 1923a: xxxix)

Prorrhetic 2 (IX 1-75)

Date: mid-5th century BCE (Jouanna 1999: 407)

Ulc. *Ulcers* (VI 400-33)

Date: 5th or 4th century BCE (Jouanna 1999: 416; Totelin 2009: 15)

VC *Wounds in the Head* (III 182-261)

Date: end of 5th / beginning of 4th century BCE (Jouanna 1999: 403); Withington 1927: 5 proposes that the work is by the same author as *Fractures* and *Joints*

Works for a Lay / Mixed Audience:

Aff. *Affections* (VI 208-271)

Date: 380s BCE (Jouanna 1999: 374)

de Arte *The Art* (VI 1-27)

Date: last quarter of the 5th century BCE (Jouanna 1999: 378); so Jones 1923b: 188 and Mann 2012: 39

Flat. *Breaths* (VI 90-115)

Date: last quarter of the 5th century BCE (Jouanna 1999: 378); end of the 5th century BCE (Jones 1923b: 221)

VM *Traditional Medicine* (I 570-637)
Date: end of 5th century (Jouanna 1999: 376; 440-350 BCE (Schiefsky 2005a: 63)

Uncertain Audience ~ Theoretical / Speculative Works:

- Aër.** *Airs, Waters, Places* (II 1-93)
Date: second half of the 5th century BCE (Jouanna 1999: 375); see further Jouanna 1996: 82
- Aph.** *Aphorisms* (IV 458-609)
Date: preserves earlier material, yet not assembled until the 4th century BCE (Jouanna 1999: 377); *ca.* 415 BCE (Jones 1923b: xxviii-xxix)
- Carn.** *Fleashes* (VIII 584-615)
Date: 5th century BCE (Jouanna 1999: 392); end of 5th century BCE (Deichgräber 1935: 27 n.4)
- Genit. /** *Generation / Nature of the Child* (VII 470-542)
- Nat. Puer.** Date: end of 5th / early 4th century BCE (Jouanna 1999: 392; Lonie 1981: 71 proposes a more fixed date of composition to sometime during the Peloponnesian War)
- Gland.** *Glands* (VIII 550-575)
Date: end of 5th / early 4th century BCE (Jouanna 1999: 393); late 5th century BCE (Craik 2009b: 12)
- Loc. Hom.** *Places in Humans* (VI 273-349)
Date: 4th century BCE (Jouanna 1999: 405); first half of the 5th century BCE (Craik 1998a: 25-29)
- Morb. Sacr.** *Sacred Disease* (VI 352-97)
Date: second half of the 5th century BCE (Jouanna 1999: 412); 420-410 BCE (Jones 1923b: 134)
- Nat. Hom.** *Nature of Humans* (VI 32-87)
Date: 410-400 BCE (Jouanna 1999: 400); 430-420 BCE (Jones 1923a: 5)
- Oss.** *Nature of Bones* (IX 162-97)
Date: a later compilation of classical material (Jouanna 1999: 398-99); see Duminil 1996: 75-115 for discussion
- Vict.** *Regimen* (VI 466-663)
Date: end of 5th or first half of the 4th century BCE (Jouanna 1999: 409); *ca.* 400 BCE (Joly 1960: 209)

Abbreviations for Galen's works that do not appear in the *Greek-English Lexicon*:

<i>Anat. Admin.</i>	<i>Anatomical Procedures</i> (<i>De anatomicis administrationibus</i>)
<i>Comp. Med.</i>	<i>The Composition of Drugs According to Places</i> (<i>De compositione medicamentorum secundum locos</i>)
<i>Def. Med.</i>	<i>Definitions of Medicine</i> (spurious) (<i>Definitiones medicae</i>)
<i>In Hp. Nat. Hom.</i>	<i>On Hippocrates' 'Nature of Humans'</i> (<i>In Hippocratis de natura hominis</i>)
<i>Ling. Hp.</i>	<i>Glossary of Hippocratic Terms</i> (<i>Linguarum seu dictionum exoletarum Hippocratis explicatio</i>)
<i>Oss. Tir.</i>	<i>Bones for Beginners</i> (<i>De ossibus ad tirones</i>)
<i>Plac. Hp. et Pl.</i>	<i>The Doctrines of Hippocrates and Plato</i> (<i>De placitis Hippocratis et Platonis</i>)
<i>Uter. Dis.</i>	<i>Dissection of the Uterus</i> (<i>De uteri dissectione</i>)

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For Midori

Chapter 1

Introduction

W. D. Smith once remarked that post-Homeric Greek medicine was informed by a ‘series of myths about what goes on beneath the skin.’¹ This project is principally a study of some of these medical ‘myths’ and how they were appropriated by non-medical writers in the 5th and 4th centuries BCE. There is a story to be told here, specifically one about changing ways to describe the body. Greek physicians (ἰατροί) were actively interested in observing the human body in professional medical contexts.² They in turn developed increasingly rich vocabulary in order to record, to categorize, and to communicate what they observed as precisely as possible, thereby revising traditional models. In essence, doctors were expanding upon contemporary accounts of the body’s material construction. This new story – complete with novel names and richer topographies – had the potential to challenge common notions about what the body is, which attracted the attention of the broader intellectual elite.³ Through an examination of classical Greek medical writers’ innovations to anatomical vocabulary, which previously has not been studied in detail, I demonstrate how these authors were revising traditional models of the human body’s construction, and explore why and to what extent non-technical writers appropriated these words. As a broader contribution, this project is a useful case study for illustrating how

1 Smith 1966: 548.

2 I use the terms ‘physician’ and ‘professional’ here and elsewhere with the qualification that who ἰατροί were in the ancient world was less defined than in the modern Western world; however, as I discuss in chapters 3 and 4, there were aspects of an author’s activity, subject matter and, for my purposes, his or her approach to the body (including vocabulary) that permitted both self-identification and outside identification with the medical craft (ἰατρική).

3 In this project I follow the definition of ‘educated elite’ or ‘intellectual elite’ offered by Ober 2009: 11, who distinguishes this class from the norm (specifically what he calls the ‘citizen masses’) in terms of their παιδεία, their exceptional engagement with the subjects of poetry, music, oratory, and philosophy/medicine (see further Jaeger 1965: xxvii). As Ober suggests, these educated elites were also distinguished by their significantly greater wealth and/or by their high birthright. See Arist. *Pol.* 1291b16-30 for a description of upper class Athenians (γνώριμοι) that follows similar lines.

new ideas produced by a specific (although loosely connected) intellectual group can be disseminated among the lay community and how these new concepts are received.

1.1. Context and aims

During the 5th century BCE there was a surge of literary activity within the Greek world. It is also during this time that the first Greek prose writings begin to appear, which included medical treatises contained in what is now known as the Hippocratic Corpus. This collection, by various authors and on various subjects concerning health and the body, preserves some of the earliest attempts at formulating a method for interpreting phenomena based on observations of the physical world.⁴ To be sure, medical writers' limited knowledge of how the body worked meant that much (but not all) of their beliefs about disease were theoretical. A prevalent medical concept, the humoral theory, held that the healthy body contained different types of fluid that must remain in balance. Disease was a disruption of this balance, and it was a physician's (usually unsuccessful) task to attempt to restore an equilibrium.⁵ Yet, these fluids that were so important to physicians circulated within a material and, to some degree, more accessible and empirically explorable body. Thus as part of their broader interests in identifying the causes of diseases within the material body and in devising treatments for them, Greek medical writers were also investigating what a human is (ὅ τί ἐστὶν ἄνθρωπος),⁶ a theme to which I shall return regularly. The pursuit of this question led Hippocratic writers to focus upon specific parts and divisions of the body that appear to have exceeded the general interests of classical Athenian society.

4 I provide a more nuanced discussion of Hippocratic treatises in chapter 3 below.

5 See for example *Nat. Hom.* 5, and Balzer and Eleftheriadis 1991 and Jouanna 1999: 314-17 for discussions. See further section 3.2 below.

6 *VM* 20.

In this project I am primarily interested in the new ways that 5th and 4th century Hippocratic writers were describing the body and in how, why, and to what extent these new descriptions were appropriated by Athenian authors. One of my main aims is to show that the different use of anatomical terminology reflected in Hippocratic treatises did not remain limited within the sphere of medical writers. As is suggested by their vocabulary, other writers were interested in physicians' attempts to organize the body and to categorize its parts through this unusual terminology. Several previous studies have identified specific medical anatomical terms that likely were appropriated into non-medical contexts. I discuss these and elaborate upon them in each chapter. Yet questions of why these terms were appropriated have generally been avoided.⁷ Thus as a larger contribution, I also investigate possible ways that medical anatomical terms, and, more broadly, medical modes of describing the body were perceived by writers outside of their original context.

Medical approaches can produce particularly strong variants of the body-model within a society. In modern Western medicine at its worst, a patient can be reduced strictly to a material thing that can be 'treated like "a piece of meat," or another "interesting case": poked, prodded, examined, tested, diagnosed, medicated, but not treated as a person with respect and consideration.'⁸ As a more positive contribution, the patient's body becomes expanded – one could say illuminated – through medicine's unique attention to specific parts. In particular, the medical community's focused interest in our internal bodies (both ancient and modern) is what sets their models in the sharpest contrast to those of the general public's. Beneath the body's

7 As I discuss in specific chapters, much more work has been done on non-medical authors' appropriation of medical vocabulary for disease and treatment, where these terms are used either literally or metaphorically as a means to explore various states of suffering and corruption.

8 Leder 1992a: 1. See also Goldman 2014, who investigates the (often derogatory) slang that modern Western physicians use, which has the strong potential to dehumanize patients.

surface lies a collection of organs, tissues, flesh, and bones that remains for the most part unfamiliar to the layperson.

Under the ‘medical gaze,’ to borrow an expression from Good,⁹ the body becomes something strange from a broader social perspective; it becomes a ‘source of data’, and ‘entirely discoverable and convertible to information.’¹⁰ Yet contrary to Good’s view, this process does not reveal ‘the natural body.’ The point is well-made by Mol:¹¹

[T]he body isn’t only unmarked [i.e. problematized] in the social sciences, but in the entire world they evoke. The power to mark physical reality...is no longer granted to medical doctors, it is granted to nobody. In a world of meaning, nobody is in touch with the reality of disease, everybody “merely” interprets them.

This modern medical perception of the body is undoubtedly more refined than that of the layperson’s, at least with respect to the number of ‘things’ that compose it; however, by approaching it as the location for disease, physicians also construct artificial models by privileging those parts that they recognize as having the greatest role in maintaining health. In turn, these parts become labelled, classified, and codified in anatomical texts.

Hippocratic physicians were in the early stages of creating more refined models of the body than those held by the general public. It is my specific claim that they were forming in their treatises a written body analogous to that produced during the increased production of medical texts in early modern Europe (*ca.* 1540-1640):¹²

The colder eye of science – the new science of the body – is associated with the ‘discovery’ or, more properly, the rhetorical deployment during the seventeenth century, of a new language with which to describe the body’s interior...The body was a territory, an (as yet) undiscovered country, a location which demanded from its explorers skills

9 Good 1994: 73. He uses the expression here to express the change that his medical students experience after the initial shock of seeing the dismembered body of a cadaver.

10 Evans 2001: 19.

11 Mol 2002: 11.

12 Sawday 1995: 22-23. For other similar studies on medicine’s effect on general perceptions of the body in the early modern period, see Hillman and Mazzio 1997, Furdell 2002, and Cregan 2009.

which seemed analogous to those displayed by the heroic voyagers across the terrestrial globe.

The rise of Greek literary culture in the 5th and 4th centuries BCE, including works of history, geography, and philosophy, similarly expanded the horizons of the known world. As part of this broad discourse, medical writers were turning their gaze inwards towards the very limits of the knowable body at that time.

This new ‘geography’ for the body compelled medical writers to stake their own claims to its areas through the development of new ways to describe the body. We often read in these works about ‘regions’ (χωρία).¹³ Within them lie parts (μέρεα) that required special names to help authors and their audience to navigate the complexity of the human body. As one Hippocratic author relates (*Loc. Hom.* 1):¹⁴

Ἐμοὶ δοκέει ἀρχὴ μὲν οὖν οὐδεμία εἶναι τοῦ σώματος, ἀλλὰ
πάντα ὁμοίως ἀρχὴ καὶ πάντα τελευτή· κύκλου γὰρ γραφέντος ἀρχὴ
οὐχ εὐρέθη·

It is my opinion that there is no beginning to the body. Rather, all [parts] are equally its beginning and all [parts] are its end, just like you cannot find the beginning of an inscribed circle.

The application of specific terms provided useful tools to make sense of what they were seeing, to mark points of reference and investigation on the global body. As a more significant influence, these words were also used to homogenize the great variations between different people’s bodies in their search to understand what ‘the body’ is (*Prorrh.* 2.12):

χωρία ὀνόματα ἔχοντα ταῦτὰ μέγα διαφέρει.

the regions [of bodies], though each having the same names, differ greatly.

13 E.g. *Nat. Hom.* 5, *Fract.* 26.

14 Translations are mine unless otherwise stated.

Yet many of the special words they used to chart this newly emerging medical anatomy had the potential to create instability, especially from the perspective of someone who was not actively engaged with medical discourse. Thus the mouth (στόμα) could become displaced to other areas of the body;¹⁵ and someone could find ‘ears’ (ὠτα) on the heart (*Morb. Sacr.* 17).¹⁶ Perhaps more oddly, the torso could be transformed into armour (τεῦχος, θώραξι),¹⁷ and various tunics (χιτῶνες) could envelop parts of the unseen body.¹⁸ Although the primary meanings of these words would have been comprehensible to any Greek speaker, the new contexts to which they were applied had the potential to create a confused image of body that was strange and, perhaps paradoxically, unnatural.

Previous studies of non-Western cultures’ exposure to modern Western medicine provide some useful parallels that illustrate a culture’s reaction to new ‘scientific’ ideas.¹⁹ It is worth mentioning a few representative examples here. In his analysis of Malaysian reactions to Western medicine during the 1960s, Wolff has argued that many Malays were suspicious of the types of ‘truth’ that Western science promises. As a result, Malays were also wary of the usefulness of Western medical treatments; however, they were still willing to accept some new treatments as long as they did not conflict with preexisting traditional medical practices.²⁰ Miller in his study of the Delaware First Nations people’s reactions to Western medicine observed a

15 E.g. *Aër.* 21 (of the womb), *Vict.* 56 (of blood vessels), *Epid.* 2.4.5 (the vagina), *Prorrh.* 2.14 (the opening of a wound).

16 I.e. the arterial appendages of the heart.

17 E.g. *Gland.* 17, *de Arte* 10.

18 E.g. *Coac.* 275, *Carn.* 3, *VM* 19.

19 It is important to note that the analogy between Greek and modern Western medical ideas and their dissemination can only be taken so far, and my intent here is to emphasize similarities in the ways that people react to new medical concepts. Western medicine’s influence upon non-Western cultures is a complex process that is intertwined with broader dynamics of power, e.g. Western Imperialism (see Cunningham and Andrews 1997, esp. 13-16 for a useful discussion of this). Classical Greek physicians were themselves members of Greek societies, so they exerted no such external pressures of influence. Rather, Greek popular culture’s interests in medical ideas (i.e. the reasons for the dissemination of medical concepts) can be isolated more narrowly to the impressive methodologies employed by physicians and to the promises of health and extended life that medicine offered. I explore this further in chapter 4 below.

20 Wolff 1965. For similar studies, see Fratkin 1996 on Samburu (Kenya) medicine; and Ugent 2000 on traditional and modern Western pharmacology in Latin America.

cultural change from describing a Western physician as ‘someone who hurts you’ to ‘someone who makes people feel well.’²¹ Chaudenson’s work on the Haitian culture’s response to Western medicine illustrates a similar negotiation of traditional and Western medical approaches. He shows that French colonists during the 17th and 18th centuries exposed Haitians to Greek humoral theories of disease, which the people incompletely integrated into preexisting approaches to healing. The notion that bodily fluids were the causes of disease seems to have been attractive to Haitians. The humoral model of medicine, however, did not address their perception of certain sicknesses as ‘evil’ entities. This encouraged them to continue to use magical techniques as ways to treat and to ward off illnesses (a practice that is still used today).²² Heinrich’s work on Chinese people’s exposure to Western medicine during the 18th and 19th centuries is concentrated on Chinese reactions to Western medicine’s preoccupation with anatomical investigations. She observes that Western medical approaches to the body, which are heavily based upon observation of the dissected body’s discrete parts, contrasted with traditional Chinese medicine’s interest in the interconnectedness of the whole body. Exposure to this new Western model compelled members of the Chinese intellectual elite to revise not only their understanding of what the body is, but also their own connections to the broader society in the face of Western influences.²³

I intend to show that during the Greek Classical period there was a comparable blend of anxiety (sometimes manifested in disdain) towards and a genuine interest in medical concepts. Medical investigation during this time offered the broader community fascinatingly novel ways

21 Miller 1977: 154.

22 Chaudenson 2001: 249-60. See McClelland Foster 1994, esp. 152-57 for a similar discussion of the persistent role of the humoral theory (first introduced by Spanish colonists in the 16th century) in contemporary Latin American folk medicine. He emphasizes the early transmission (or the ‘filtering down’) of medical knowledge from the Western educated elites to the broader population, where it became integrated into traditional medical treatments. See also Logan: 1973, who illustrates the reluctance of contemporary Guatemalan rural populations to accept modern Western medical treatments that they feel do not agree with humoral concepts.

23 Heinrich 2008, esp. 113-48. See further Xie 2001: 117-18 for a discussion of contemporary lower class Chinese people’s adherence to traditional medicine, since it is located within a philosophical framework that Western biomedicine does not provide.

of imagining the body; however, traditional notions about something apparently so familiar as someone's own body were difficult to challenge, and these new concepts were sometimes met with scepticism. Thus, acceptance of physicians' ideas by the intellectual elite was a gradual process that ultimately did not fully displace traditional concepts. Nor was a complete displacement possible, since physicians as a part of Greek society were also faced with this process of negotiation. Their attempts to understand the body better did not require them to cast aside preexisting knowledge of bones, flesh, and organs that comprise a human. What physicians were creating were more detailed tapestries of the body's construction and further explanations for how it functioned. I should stress that classical Greek physicians were expanding the traditional body; they were not erasing it and starting anew.

The classical body as a broad category in both literature and the visual arts has received increasing attention over the past two decades.²⁴ In general, these scholars have examined modes of representing and imagining bodies in antiquity that illustrate their mutability, either temporally or within Greek society itself. A common theme within these studies – although often only implied – is that the body is a cultural construction; there is no universal, ahistorical, model of a 'natural body' shared between all societies, or even within a society itself.²⁵ The physical body as part of social discourse is to a degree culturally formed, something learned.²⁶ As Isenberg and

24 For examples, see Zeitlin 1996 and Cawthorn 2008 (on gendered bodies in drama); Kosak 2004 (on concepts of sickness in medicine and in the tragedies of Euripides); Hawley 1998 (on concepts of bodily beauty in tragedy); Stehle 2002 and Revermann 2006: 145-59 (on the body in Aristophanes); Métraux 1996, Leftwich 1995, Amberger-Lahrmann 1996, Neer 2010, and Stewart 1997 (on the body in visual arts); Osborne 2011 (on more general themes of the body in Greek art and literature); Holmes 2010a (on the place of the body in relation to the soul); Thomas 2004 ch. 3 (on ethnographic differences in Herodotus); Edwards 1997 and Rose 2003 (on the disabled body). For broader studies of the body in antiquity (including the Roman and early Christian worlds), see the collected volumes of Montserrat 1998 and Porter 1999a.

25 On the body as a historical product, one that is always in flux, see Cohen 1994 and Jones 2008 (esp. 245-47); see earlier Foucault 1990: 151-52 for his aim to produce a 'history of bodies,' although I am not concerned here with Foucault's study of institutional (*viz.* religious and scientific) control over the body (see Shilling 2003: 66-69, and further Potte-Bonneville 2012 for a useful overview of Foucault's theories of the body). For discussions of the body as a cultural construction, see Lock 1997 and Blackman 2008: 22-23.

26 Cf. Ellen 1977 for an analysis of common ways that languages describe parts and areas of the body, e.g. polarities such as left/right, front/back, upper/lower. See also Brown 1976 for a discussion of anatomical taxonomies based on 'part of' and 'type of' organization.

Owen write:²⁷

The individual's body is presented to him, taught to him by society...Our attitudes about our bodies arise from society's image of itself...The human body, then, is a universal symbol system: every society attempts in some way to socialize its members, to educate its bodies.

In this study, I am not specifically interested in value-systems that classical Greeks mapped upon the body, although I hope that my work will be a contribution to this area.²⁸ Nor do I explore the complex issues of semiotics of the body.²⁹ Instead, I concentrate on the more basic question of how medical authors were expanding upon common anatomical vocabulary. Since these anatomical labels emphasized parts and structures that were previously unknown or under-recognized, they provided opportunities for the Athenian intellectual elite to think about the body from a different perspective.

Any attempt to restore constructions of the classical Greek body (both lay and medical), which are chronologically so distant from our own, presents some epistemological problems. As Cawthorn notes, 'The lived-in ancient body cannot be known, and the fragments of textual bodies are all that survive.'³⁰ What we have to pore over is the written word itself that has been filtered through 2,500 years of changing models of what the body 'is.' This, in turn, has created an 'instability' in modern conceptions of the ancient body.³¹ It is indeed difficult to distance ourselves from something seemingly so familiar to us as our own bodies and to consider what the body can be from another culture's perspective, especially one so distant from our own. But such models are not entirely irrecoverable: by studying vocabulary used in a broad selection of

27 Isenberg and Owen 1977: 3.

28 See the collected volumes of Montserrat 1998, Porter 1999a, and Cohen 2000 for examples of this approach.

29 See Ruthrof 1997: 3-23 and Lock 1993 for useful overviews.

30 Cawthorn 2008: 3. For a similar interpretation, see du Bois 1996 who emphasizes the fragmented body mirrored in the poetic fragments of Sappho.

31 Porter 1999b: 1-2.

these texts – particularly the organization of the body that they reveal through words for its parts – we can attain a fuller sense of how it was imaged and re-imagined.

In light of the increased attention to the classical body, it is somewhat surprising that there have been no detailed studies of how classical Greek medical writers used anatomical words to innovate upon traditional models of the body.³² Part of my intent in this work is to provide a sounder foundation for reconstructing how this was done. A study of the vocabulary used to describe the human body in the Classical period will lead to a better understanding of how the so-called myths about it were informed by subjective impressions. This project will further augment our understanding of Greek medical vocabulary, and, as a broader contribution, elucidate the conceptual structures through which classical Greek writers navigated the human form.³³

A study of a special group's anatomical vocabulary is an especially useful way to approach the questions of how and why lexical models of the body can change. The particular investigations of medical writers encouraged them to develop special terms for the human body (or to appropriate preexisting ones for specific purposes) in order to facilitate communication between members of their professional circles.³⁴ By identifying what these terms were, we can gain a better understanding of their innovations. Additionally, this specialized vocabulary can help us to identify the extent to which non-specialists engaged with these new ideas. Since these terms can be identified with some degree of certainty as belonging primarily to a subset of a specific group's terminology, their dissemination can be tracked.

32 The fullest studies of Greek anatomical vocabulary to my knowledge have been Daremberg 1865: 10-59 (on Homeric vocabulary) and Southard 1971 (on Aristophanic vocabulary). I discuss more limited analyses in their context.

33 Thus adding to existing studies on Hippocratic vocabulary, e.g. Brock 1961 (vocabulary of pain); Lopez-Ferez 2006 (sexual vocabulary); and Goffart 2000 (obstetrical vocabulary).

34 As I discuss in chapter 3, however, Hippocratic writers had yet to establish an anatomical vocabulary that was homogenous across all of the diverse treatises. My specific claim is that these writers used either new terms or preexisting terms in special ways that non-professionals would probably not have easily understood.

1.2. Methodology

The core data for this work are 270 terms for the body used by either Archaic or classical Greek authors (Appendix 1). The process of identification involved previous limited studies of Greek anatomical vocabulary, close reading of the Greek texts, and consultation of *indices locorum*. The list of anatomical terms is not exhaustive. I have excluded some words because of their questionable identification as salient terms for body parts.³⁵ The distinction is not always clear, and I have occasionally had to use my best judgment, but as a general rule I have gravitated towards inclusion rather than exclusion. I have also excluded most euphemisms and slang for sexual organs, classes that are especially prone to lexical innovation.³⁶ The broad scope of writings that I investigate in this study leaves the possibility that I have missed some anatomical terms; however, I expect this number to be small.

My approach to anatomical word use within each area of literature in my study – epic, medicine, drama, and prose – began with researching the specific appearance of the terms in each genre. This was primarily done through the use of the *Thesaurus Linguae Graecae* (hereafter *TLG*), a database that allows the search of individual word-appearances within most works of Greek literature.³⁷ With few exceptions, I have explored all complete works and fragments from the Classical period that are included in the database.³⁸ Once complete lists of vocabulary were compiled for each genre, I compared them to one another and to vocabulary

35 E.g. δίοδοι (*passageways*): Hp. *Loc. Hom.* 9 (general channels in the body), Pl. *Ti.* 79c7 (the nostrils); but these instances appear to be casual uses of the term, cf. Th. 2.102 (passageways of water) and [A.] *Pr.* 1050 (passageways of the stars). So σύνδεσμοι (*bindings*): Hp. *Art.* 8 (attachments of ligaments), E. *Hipp.* 199 (ligaments?), but elsewhere at Pl. *R.* 520a4 (bonds of the state) and E. *Ba.* 697 (garment fastenings). These words, however, do suggest ways of looking at the body that apparently differed from those of the general public, and I occasionally discuss similar examples in this work.

36 For a detailed discussion of genitalia vocabulary in Greek comedy, including slang and euphemisms, see Henderson 1991: 108-51; for euphemisms for genitalia in the Hippocratic Corpus, see Lopez-Ferez 1999. As a point of comparison from modern English that illustrates the complexity of the issue, a group of male university students were able to produce a list of 144 words (including slang and euphemisms) for the penis within 30 minutes (Cameron 1992: 369).

37 The database is available online at <<http://www.tlg.uci.edu/>>.

38 My discussion of anatomical terms preserved in inscriptions is minimal. I have, however, searched all words through the Packard Humanities Institute's database of Greek inscriptions.

lists from both the Homeric epics and the Hippocratic Corpus. Lastly, from these lists I identified uncommon anatomical words that overlapped with specialized or ‘technical’ Hippocratic vocabulary.

The definition and identification of technical anatomical terms are not easy tasks, especially for the classical Greek world when medical terminology was in an early stage of development.³⁹ As a broad definition, technical vocabulary is a set of words used by a specific field as a shorthand to express concepts, processes, and material things that are of special interest to the group. In this study I am most concerned with terms that physicians either created or appropriated for special medical reasons. From this perspective, not all Greek anatomical terms are technical in nature, that is, identifiable as belonging to a specific group. Classical Greeks had a large lexicon at their disposal to describe the human body.⁴⁰ When a non-medical author used words like ὀφθαλμός (*eye*) or γαστήρ (*belly*), we cannot expect that he or she was specifically drawing upon the proprietary vocabulary of medicine. This is not to say that classical physicians were not interested in parts such as the eyes or the belly (they certainly were); my claim is that investigations into these and similar general terms cannot tell us much about either the lexical innovations of medical writers or the dissemination of medical words.

There are some specific earmarks of technical vocabulary in this sense that assist in its identification. In this project, I follow the definition of Greek technical terms proposed by Dover, who uses medical terminology as a primary model:⁴¹

- 1) words that are never used outside of a specialized area
- 2) words that are used within a specialized area, yet have synonyms in common vernacular

39 Schironi 2010: 345, Lloyd 1983: 165, and Chantraine 1972.

40 As I discuss in chapter two, the majority of these already appear in the Homeric poems, which illustrates the durability of common anatomical terms in the Greek language. As further evidence of the persistence of basic anatomical words in language, see Buck 1949: 197-257 for a thorough collection of Proto Indo-European anatomical terms (also preserved in other Indo-European languages) that the Greek language inherited.

41 Dover 1997: 114. A similar definition is offered by Schironi 2010: 338.

- 3) words that have meanings in a technical context that are distinct from the meanings in common use (i.e. common words used as metaphors in a specialized context)
- 4) and words that are considered technical because of their frequent appearance within a specialized field

Willi, who is wary of Dover's fourth point, provides a more rigid definition of classical Greek technical vocabulary.⁴² Specifically investigating the language of Aristophanes, he accepts the existence and the possible identification of technical medical vocabulary within classical Greek literature; however, he does not readily admit the labelling of a term as technical when it also appears outside of its professional context, especially in unmarked (i.e. apparently non-medical) contexts. Parry in his analysis of Thucydides' appropriation of medical language shows similar reservations.⁴³ Citing Thucydides' possible technical use of the adjective αίματώδης (*blood-like*, 2.49.2) in the context of the Plague of Athens (430/29 BCE), he argues that any Greek would be familiar with its meaning (unlike a modern non-professional's understanding of the technical medical word *hematoid*). Perhaps this is true, but, at least in the context of developing classical medical vocabulary, a distinction should be made between a non-professional's comprehension of a term and his or her use of it.⁴⁴ It remains that Thucydides is the only non-medical author before Aristotle to use αίματώδης, which suggests (so far as we can tell) that the word was properly in the domain of the medical profession.⁴⁵

If near-certainty of a word's technical nature were the primary concern, Willi's approach is the most exacting. In this study, however, I am interested in how terms used by a special group can in fact be appropriated by writers outside of their native area of discourse (Dover's

42 See Willi 2003: 51-59.

43 Parry 1969: 111.

44 My knowledge of Greek, for example, allows me to understand the meaning of *hematoid*, but I do not think I have ever used it in a sentence before I wrote this page.

45 For examples of the use of αίματώδης in the Hippocratic Corpus, see *Epid.* 6.3.24, *Coac.* 22, *Nat. Hom.* 12, *Mul.* 30, *Aph.* 7.70.

fourth criterion). In following chapters I demonstrate that there is good evidence to support that this borrowing of technical terminology occurred. First, several examples of the circulation of medical ideas outside the boundaries of the profession show opportunities for medical vocabulary to escape from its original context. Secondly, a word's appearance outside of medical writings, sometimes within medical or quasi-medical contexts, suggests that at least some anatomical terms were explicitly earmarked as being different from the common vernacular and, what is more, that non-medical authors were using them with the original sources in mind. Others terms, however, have lesser connections, so their associations with medical vocabulary remains more tentative.⁴⁶

Further aids in identifying technical medical words used by non-medical authors are the types of parts given labels and the ways in which they are described. Medical approaches encouraged Hippocratic authors to use names for parts of the body that were considered to be particularly important for understanding health and disease. Among the most important of these were external divisions of the torso, containers they believed held fluids, and channels that conveyed fluids between these containers. Medical writers often used metaphors derived from common words to identify these parts. Since the general public seems to have had little interest in such areas of the body (so far as we can tell from extant writings), appearances of the same words to describe them in non-technical and Hippocratic writings provide further evidence of non-medical writers' interaction with medical vocabulary.

Finally, it is necessary that I offer and discuss some *caveats* regarding the limitations of the available sources. We today are only able to study a very small part of the writings produced during the Classical period. This presents two potential problems in my present study. First,

⁴⁶ For example, there appears to have been some overlap between medical terminology for the human body and the vocabulary of sacrifice and haruspicy (e.g. the hepatoscopy scene at E. *El.* 826-33). I discuss this passage and its connections to medical vocabulary at section 5.4.1 below.

there is the possibility that an anatomical term might have appeared more frequently in lost non-medical writings and that, by chance, only one or two examples of its uses survive outside of the Hippocratic Corpus. This is a potential problem for any study of Greek vocabulary, so in order to say anything we must rely on best evidence. The broad scope of my investigation ensures that due diligence has been made to identify a word's appearance in surviving classical medical and non-medical texts. The types of words and the contexts in which they appear also provide further reason to suspect the appropriation of medical language by non-professionals. Moreover, the haphazard transmission of ancient texts can work in our favour when identifying technical terms, since a work's survival is usually not dependent upon any specific vocabulary that it might contain. It is therefore possible to suggest that the terms used in surviving literature are to some degree representational of word-use within a genre.

The second problem concerns the identification of the direct influence of any specific Hippocratic writing upon non-technical authors. We have a limited knowledge about the geographical origins, date, and circulation of these medical treatises, which were probably only assembled sometime during the Hellenistic period.⁴⁷ Some writings were undoubtedly composed in Ionia, the location of the famous school of Hippocrates on Cos.⁴⁸ Others, specifically the collection of patient medical histories called the *Epidemics*, describe itinerant physicians visiting a number of cities in mainland Greece.⁴⁹ Most writings, however, cannot be firmly located. We know even less about their authorship.⁵⁰ Despite these limitations, we can be confident that medical treatises at least similar to those in the Hippocratic Corpus were circulating in 5th and 4th

47 See Jouanna 1999: 56-71, Langholf 1990: 2-4, and Craik 1998a: 1-8 for good overviews of this problem.

48 Jones 1923a: xxix-xx; Nutton 2004: 61; Jouanna 1999: 62-63.

49 *Epidemics* 1-4 and 6 mention places in Thrace, Thessaly, and the southern areas of the Black Sea. *Epidemics* 5 and 7 describe more southern travels, including areas of the Peloponnese, Olynthus, Athens, and Delos. See further Jouanna 1999: 387-90.

50 We only know from a comment by Aristotle at *HA* 512b that *Nature of Humans* was probably written by Polybus, the son-in-law of Hippocrates. See Langholf 2004: 252 for discussion.

century Athens.⁵¹ Furthermore, because of the exchange of medical ideas evident within the Hippocratic Corpus itself,⁵² we can expect that the educated Athenian elite had access to and could draw upon medical texts that resembled specific ones that survive in the Corpus.⁵³ It must remain a matter of doubt whether or not they are those exact ones that come down to us today.

1.3. Limitations

A topic as far-reaching as the explication of the classical body requires some restriction. First, I am primarily concerned with vocabulary for the material body, the σχήματα or ‘structures’ as one Hippocratic author writes,⁵⁴ which excludes words for various fluids (e.g. ἰδρώς, *sweat*; χολή, *bile*; αἷμα, *blood*) that are properly in the domain of physiology. This focus on the material body further eliminates the complex question of the relationship between the body and the soul in classical Greek thought.⁵⁵

Secondly, following Greek medical writers’ general approach to anatomy, I concentrate on constructions of the body as a genderless entity, or a ‘one-sex’ model.⁵⁶ The principal material parts that all humans have in common – those that reflected ‘human nature’ (ἄνθρωπινή φύσις) in general – were considered to be most important for their research. As a result, gender specific organs were marginalized in their theories of health and sickness. It

51 See chapter 4 for discussion.

52 For the intertextuality of Hippocratic writings, see Craik 2006a, esp. 334: ‘It may be said that all the Hippocratic works are mixed and derivative to some degree, and that few, if any are original in any accepted literary sense.’

53 I am here taking a more cautious approach than Craik 2001a, for example, who proposes that Euripides might have had access to the Hippocratic texts *Breaths* and *Articulations*. The best we can say is that Euripides was familiar with medical ideas contained within these works.

54 *VM* 22 and Schiefsky 2005a *ad loc.* for discussion.

55 See Gundert 2000 for the negligible presence of the soul (ψυχή) in Hippocratic thought. A useful starting point for discussions of the relationship between the soul and body in classical Greek thought is Holmes 2010a, esp. 1-40. Part of her argument is that modern scholarship often overstates this distinction because of the influence of Cartesian thought. Instead, she convincingly argues that ancient Greeks made a distinction between what is seen and what is felt, yet these two approaches did not create a schism between material and psychic states of being. See further Broadie 2001 for a comparison between Plato’s and Descartes’ soul/body division, and Carter 1983, esp. 96-154, for Descartes’ own theories.

56 See Laqueur 1992, esp. 25-62 for the historical development of this ‘one-sex’ model from antiquity to the early 20th century. For resistance to this model see King 2013, which I address below.

should be noted, however, that this genderless body in Greek medicine still tended to use the male body as its default; the female body was exceptional, and as an unfortunate and long-lasting consequence for scientific progress, it was greatly simplified.⁵⁷ These limitations mean that my project is a study of a ‘normalized’ androcentric model of the material body.

I further restrict my discussions of specific authors. Although I begin this study with a contextual analysis of anatomical vocabulary in the Homeric poems (8th century BCE in their written form, but reflecting an earlier oral tradition), I concentrate on works roughly from the middle of the 5th to the middle of the 4th centuries BCE. This chronological range encompasses both the Hippocratic writings that I examine in my study and principal non-medical Athenian authors.⁵⁸ I include the surviving plays and fragments of Aeschylus, Sophocles, and Euripides, and old and middle comedy, yet I restrict my analysis of prose writings to the works of Herodotus, Thucydides, Plato, and Xenophon. I have excluded orators from my study, because of the low appearance of anatomical terminology (both general and specific) in their speeches. I have also chosen to exclude a detailed analysis of Aristotle’s anatomical vocabulary, although his early life falls within my chronology (*ca.* 384 BCE-322 BCE). This is both because of his regular engagement with medical concepts and language and because of the magnitude of his

57 See Laqueur 1992: 25 (although he is specifically concerned with Galen’s model of the body). For a more nuanced model of the female body in Hippocratic thought, see King 1998a (esp. 6-13) where she argues that Hippocratic medicine concentrated on sexual differences of generation and of bodily fluids (e.g. semen and menstrual fluid), physiological models that I have excluded from my study. For a Hippocratic example of the minimization of gender differences in medicine, see the comment at *Loc. Hom.* 46: τὰ γυναικεία νοσεύματα καλούμενα· αἱ ὑστέραι πάντων τῶν νοσημάτων αἴτιαί εἰσι (‘The so-called women’s sicknesses: their uteruses are the cause of all of these sicknesses.’). As King 1998a: 11 points out, however, the Hippocratic *Diseases of Women* is an exception among the treatises, since the authors of this work propose that women’s material bodies are very much different from men’s (e.g. *Mul.* 1.1: φημί τὴν γυναῖκα ἀραιοσαρκότερην καὶ ἀπαλωτέρην εἶναι ἢ τὸν ἄνδρα· ‘I contend that a woman has more spongy flesh and is more delicate than a man.’). But even here the author is only noting the sexual differences in the quality of material (here specifically σάρξ, or *flesh*). He is not proposing significantly different models for the types of parts that comprise male and female bodies.

58 Jouanna 1999: 57 locates most of the Hippocratic writings to within the life of the historical physician Hippocrates of Cos (*ca.* 460-370 BCE); Nutton 2004: 60 suggests a similar date range of between 420 BCE and 350 BCE. I discuss this further in the introduction to chapter 3 below. See ‘List of Abbreviations’ above for the estimated dates of specific Hippocratic writings that I discuss.

corpus;⁵⁹ however, I do mention his writings frequently to illustrate the use of words in a technical context within Athens.

1.4. Organization and chapter summaries

My analysis of anatomical terminology in this project is organized according to writing genres. This approach, rather than any other (e.g. organization by parts of the body or word-types), perhaps requires explanation. Although authors within the same genre show different levels of engagement with anatomical vocabulary, the shared subject matter and aims of each group usually direct authors to describe the body in similar ways. In chapters two and three I discuss terms used in the Homeric poems and the Hippocratic Corpus respectively. My intent in these chapters is to examine the extent to which anatomical vocabulary in the Hippocratic treatises differed from and expanded upon earlier vocabulary. In chapter four I discuss the place of medical thought within classical Athenian society and the Athenian elite's exposure to medical concepts. This serves as a transition to the close study of anatomical language in the non-medical writers of the classical period. In chapters five to seven I investigate the potential impact that medical vocabulary had on non-medical literature in Athens and how authors in each genre integrated these words into their own works.

After a review of relevant scholarship in each chapter, I discuss specific issues of and approaches to anatomical vocabulary in each genre. In the following sections I adopt an exterior/interior body approach in my study of specific words. In chapters two (Homeric epic) and three (Hippocratic treatises) I discuss a broad range of terms under these headings. In chapters five to seven (Athenian authors) I briefly survey common anatomical word-use in each

59 For a recent and full analysis of Aristotle's conception of the body and its effects on later thought, see Carbone 2011; for discussion of Aristotle's close relationship with Greek medicine and his effects upon its later development, see van der Eijk and Francis 2009; for Aristotle's use of medical imagery and language in a non-medical context, the *Poetics*, see Craik 2006b.

genre before investigating examples that suggest medical connections. For each of these case studies I provide a supporting analysis of the word in its context that is often absent in previous studies of anatomical vocabulary.

Chapter 2: The body in the Homeric epics. These poems, especially the *Iliad* because of its many vivid battle scenes, contain a mature lexicon for the human body. Many of these anatomical terms comprise the core vocabulary for later classical writers (both medical and non-medical). I have included this discussion of Homeric anatomical terms for two reasons. First, the Homeric poems provide a baseline for non-technical Greek vocabulary for the body. This will allow me to pass over discussions of common anatomical words more quickly in later chapters. Secondly, there are some terms that either do not appear in later classical Greek literature or have clear changed meanings that suggest a different model of the body in earlier Greek thought. I further show that the Homeric poems' most detailed use of anatomical vocabulary could draw the audience's attention to questions of identity, problematizing the inherent disconnection between an individual as a whole and his or her multitude of parts. A similar approach is used when later dramatists appropriate unusual vocabulary for the body.

Chapter 3: The body in the Hippocratic Corpus. After defining classical medicine as an identifiable craft (τέχνη) in Greek thought, I begin by analyzing the role of the body in the Hippocratic Corpus and the extent to which it was examined. One main concern of Greek physicians was to investigate what a human is. Since a primary task of their profession was to understand disease, their answer to the question was to examine the human body as a material object; however, both practical and religious reasons limited physicians' access to the living human body. As a result, they sought out other avenues for investigating 'bodies' in general, including corpses and, to a greater degree, the bodies of animals. In order to accurately record

and to potentially circulate their observations and theories to a larger audience, physicians produced new terms and metaphors for these parts that differed from the common vernacular. My principal argument is that these new verbal bodies that they created, gathered from disparate sources other than living patients, encouraged new ways of thinking about what the human body is.

Chapter 4: The General Public and Medicine in Athens. In this chapter I address the dissemination of medical ideas among the broader intellectual elite. Following a survey of the interest in health and the overall high esteem of the medical profession in Athens, I discuss examples that illustrate non-medical writers' active engagement with medical ideas. A specific claim in this chapter is that non-medical authors (and more broadly the general public) saw value in learning about the burgeoning field of medicine. These models of health, sickness, and the body were not considered abstract academic exercises, but rather possible ways of understanding how to extend life. The practical applications for medical knowledge therefore encouraged non-professionals to engage with medical ideas, and as an extension, medical vocabulary itself.

Chapter 5: The Body in Tragedy. Athenian tragedy provides our earliest evidence for Athenian writers appropriating Hippocratic terminology. Among the three principal tragic playwrights, Euripides seems to have exploited medical language to the greatest extent. On the other hand, Aeschylus, the oldest of the three tragedians, apparently did not use any. This perhaps further indicates that Hippocratic medical ideas had yet to become popular among the Athenian educated elite before the middle of the 5th century. My main argument in this chapter is that Sophocles and Euripides both exploited uncommon medical vocabulary as a supplement to Homeric poetic terms as a way to estrange the body, thereby making it an object of special enquiry. This novel anatomical language, in particular metaphors used by physicians, allowed

tragedians to problematize what the human body is and to make it something grotesque. In their hands, it became an open system that, through ambiguous vocabulary, was able to absorb parts of the external world, including both inanimate objects and animals.

Chapter 6: The Body in Comedy. In comparison with tragedy, there are far fewer possible medical terms used in comic theatre. The earliest examples of unusual terminology with medical associations appear in parodies of tragic language without an explicit medical context. I suggest this illustrates the limited expectations placed on the broad audience to identify parodies of medical discourse. Late 5th and 4th century examples imply an audience's greater familiarity with the field. Moreover, I suggest that while tragedians used such uncommon vocabulary for the body to encourage sublime or eerie feelings of discomfort about what we are, comedy was especially prone to use it to suggest the body's absurdity. In comedy, anatomical vocabulary sometimes emphasizes specific parts of a character to the point of the grotesque. At other times, the effect of listing bodily parts is self-effacing, distorting or destroying any sense of a unified whole. At this point, anything can happen. The body can be stretched and skewed to suitably comic proportions.

Chapter 7: The Body in Athenian Prose. This chapter represents a counterpoint to anatomical language in both tragedy and comedy. For practical and perhaps aesthetic reasons, prose writers' use of technical anatomical language is generally low, since these authors had the common aim to elucidate their subjects for the reader rather than to complicate them. However, some examples of medical terms in each author's writings shows that, as part of the intellectual elite, he had exposure to contemporary medical language. In these instances, we find special anatomical terminology used either as authoritative support for their subject matter or as a way to criticize medicine's approach to the body when it is applied to other areas of enquiry.

By the end of this project, I hope to have illustrated both how Greek anatomical vocabulary was used in different genres and, more importantly, the effects that various approaches had on the creation of verbalized human bodies. My analysis can be broken down into three general claims. First, our evidence from the Homeric epics shows that the Greek language had a rich vocabulary to describe the body that suggests a detailed knowledge of human anatomy at an early stage. Secondly, because of their particular interests, Greek medical writers approached the human body in different ways that expanded upon traditional notions about what the body was. Not only were under-recognized anatomical parts brought to the foreground of their studies, but these parts – often only visible in corpses and animals – could complicate what a living human was. Thirdly, non-medical writers exploited these new approaches as ways to create exceptional models of the human body in their own works. I demonstrate that these bodily descriptions, which range from the grotesque to the sublime, reflect the Athenian intellectual elite's mixed reactions to the new concepts of medical science, which were still at the periphery of general knowledge.

Chapter 2

The Body in the Homeric Epics

‘...how excellent an anatomist our Homer was, whose skill in those times, methinks, should be a secret.’

George Chapman (commentary to *Iliad*, book 14)

The *Iliad* and *Odyssey*, the earliest surviving works of Greek literature, are particularly important in a study of Greek anatomical vocabulary, since they provide an impressively large number of terms for the human body that is not matched until the Hippocratic Corpus (5th - 4th century BCE). For comparison, the number of anatomical terms in the poems rivals that of English medical texts up to the 14th century.¹ My intent in this chapter is to make three particular points. First, the poems contain some words whose definitions appear to change in meaning or that are absent in later Greek writings (I focus particularly on five of these: δέμας, χρώς, γυῖα, μέλεα, and ἴνες). This class of anatomical terms illustrates that the concept of the body is an artificial cultural construction that can change over time. Second, the poems also preserve a large number of words for the body that persist into the Classical period with no perceptible change in meaning. This class of durable anatomical terms therefore represents part of the core vocabulary of the Greek language (both technical and non-technical), and suggests a mature and detailed language for the body at an early stage.² Third, the large anatomical lexicon of the Homeric

1 Norri 1998: 121 has counted 126 body terms in English medical writings up to the 14th century. The Homeric epics have 119 terms.

2 The role of the epics as principal tools in an elite classical Greek’s education means that he or she also would have been familiar with the ways that the poems describe the body. The formally educated classical Greek then had an early preexisting standard for not only general, but also complex anatomical terminology for the exterior and interior human body. Plato for instance states that Homer was the educator of Greece (*R.* 606e: τὴν Ἑλλάδα πεπαιδευκεν); Xenophanes adds that Homer enjoyed this position from the beginning (ἐξ ἀρχῆς: fr. 10 DK). Although both authors question the value of this education in these passages, their polemics against Homer further illustrate the well-established role that the epics held in the late archaic and classical Greek world. For a concise discussion of Homer’s role as educator in the Classical period and on these passages specifically see Marrou 1964: 21-34 (esp. 29-30). See also Jaeger 1965: 35-56.

poems can be used to assemble an internally consistent and sophisticated verbal representation of the human body. Major parts (both external and internal) are mentioned in the poems, and their locations are accurately described in ways similar to later medical writings. As I argue more fully in later chapters, however, Homeric anatomical vocabulary – as detailed as it is – was insufficient to relate the more nuanced medical body that was being explored by medical writers later in the Classical period.

2.1. Previous interest in Homeric anatomical vocabulary

The Homeric poems' detailed mapping of the body has attracted interest since their earliest critics. At least by the Classical period, observations of Homer's broad knowledge in such areas show that the poems were considered exceptional. Plato is the first example we have of someone suggesting Homeric expertise in medicine (and we may assume its anatomical dimension as well), but it seems likely that the idea was around much earlier.³

Homer is mentioned only once in the Hippocratic Corpus at *Joints* 8, a work on the setting of broken bones and dislocations.⁴ This is surprising, since the poems often mention doctors and medicine in addition to their detailed descriptions of the body;⁵ however, Homer is also only one of two poets specifically named in the Hippocratic Corpus (and the only one mentioned positively), which suggests that he could be a worthy authority on medicine within

3 See *R.* 599b-c, *Ion* 538c. Both passages depict Socrates questioning whether poetry (particularly the Homeric epics) can teach skills beyond the poetic art, including medicine. See further Arist. *PA* 673a, *GA* 785a, and *HA* 513b for examples of other Athenian interest in Homeric anatomical descriptions.

4 Twice, if we include an abridged version of the same passage at *Mochl.* 5.

5 There are a handful of references to physicians in the poems, and all are favourable to the art. In one instance it is said that healers are 'worth many men' (*Il.* 11.514), and in another their knowledge of humans is heralded (*Od.* 2.231). For other references in the epics to healing see *Il.* 4.189-219, 5.402-2 and 889-90, 11.833, 13.213, 16.28, and *Od.* 19.457. This last passage is notable for its description of a healing song used in conjunction with bandaging to heal a young Odysseus. For discussion see Renehan 1992. For shorts overviews of the medical art and of physicians in the poems see Cordes 1994: 12-18 and Wood 1931.

medical circles as well.⁶ His name appears in a discussion of dislocations of bones and how different constitutions of the body are factors in a person's susceptibility to them. As evidence, the Hippocratic author describes the high frequency of thighbone dislocations (ἐκπίπτουσι...οἱ μηροὶ ἐκ τῆς κοτύλης) of oxen during winter, and attributes this to the animal's loss of body mass. The author argues that this is because an ox's lip is more projected than those of smaller herbivores, so the animal has more difficulty eating the short herbage that is found in winter. He then provides as proof a line of dactylic poetry that he attributes to Homer:⁷

‘Ως δ’ ὀπότε ἄσπασιον ἔαρ ἤλυθε βουσὶν ἔλιξιν

As when the season of spring arrives, welcome to crumpled-horned cattle

The quotation is not at all medical, and contains no specific description of medical matters, yet Homer is still used as proof:

δεῖ δέ· καλῶς γὰρ Ὅμηρος καταμεμαθήκει, κτλ.

And it should be [true], for Homer has well observed, etc.

The author has previously been self-conscious about using oxen as a parallel example of the condition of the human body,⁸ but seems to feel vindicated in doing so, since the great Homer himself has used the beast in a human-animal simile.

6 To my knowledge, the only other authors explicitly mentioned in the Hippocratic Corpus are the Presocratic philosopher and poet Empedocles (*VM* 20) and the trainer/doctor Herodicus of Selymbria, Thrace (*Epid.* 6.3.18), who possibly also wrote treatises on health, since Plato (*R.* 406a, *Phdr.* 227d) and Aristotle (*EE* 1243b) were both aware of his theories. In antiquity this Herodicus was sometimes confused with Herodicus of Leontini (Gorgias' brother), who had no known connection to medicine, as well as Herodicus of Cnidus (the island renowned as the rival medical school of Cos), who apparently did. For a discussion of this problem of Herodicus' identity and full bibliography, see Manetti 1999: 110; for the argument that *Epidemics* 6 and Plato are describing the same Herodicus, see Manetti 1982: 69-70.

7 The line is not from any Homer that we possess, although the phrase βουσὶν ἔλιξιν does appear as a line ending at *Iliad* 12.293 in a simile of a lion attacking an ox.

8 This is evident in the preceding sentence: γίνονται δὲ βόες λεπτότατοι, τοῦ χειμῶνος τελευτῶντος· τότε οὖν καὶ ἐξαρθρέουσι μάλιστα, εἰ δὴ τι καὶ τοιοῦτο δεῖ ἐν ἱητρικῇ γράψαι· ‘Now cattle are thinnest at the end of winter, and it is then especially that they have dislocations, if indeed such a matter should be cited in a medical work.’

Authors from later antiquity such as Plutarch (*ca.* 46-120 CE), Galen (129- *ca.* 216 CE), and Celsus (2nd century CE) also considered Homer to be an authority on medicine in his own time.⁹ With the exception of Galen, these authors pay little attention to the accuracy or depth of Homer's medical knowledge, but focus more upon the references to physicians and medicine in the epics. Later Homeric scholiasts, commentators, and lexicographers naturally show a specific interest in vocabulary, and occasionally provide some useful information about the difficulty and different interpretations of a word in later Greek, but these are often not very helpful in illuminating an anatomical term's original meaning.¹⁰

The first modern scholar to analyze the Homeric poems' vocabulary for the body was the classicist and physician Charles Daremberg in his *La médecine dans Homère* (1865).¹¹ Contained in this monograph is a detailed glossary of 119 different terms for the body.¹² The number is impressively high, and Daremberg rightly concludes that Homeric vocabulary constitutes the core for both popular and scientific Greek anatomical language.¹³ This number is correct, and forms the basis of my study of Homeric vocabulary; however, the listing is

9 Plu. *On Homer* (Περὶ Ὁμήρου) [B] 200-6, *Q Con* 745a; Celsus: Pr. 3-4; Galen: frequently, e.g. *In Hp. Nat. Hom.* 16, and for a short discussion Roselli 1999: 364. Roselli remarks at n. 14: 'Homer's authority in the field of anatomical terminology is frequently invoked in [ancient] commentaries on surgical treatises.' See also Philox. *Gramm.* fr. 148. The claims by Plutarch and Celsus are no doubt influenced by the fact that they were interested in medicine, but not physicians themselves.

10 The *hapax* term βρέχμος (*Il.* 5.586) is a prime example. This passage in which the word appears describes only that the hero Mydon falls from his chariot onto his βρεχμός and shoulders (ἐπὶ βρεχμὸν τε καὶ ὤμους). This suggests a certain part of the head, but we are left to speculate about what part this is. Later attempts to define the term offer various interpretations. Σ *vet.* 5.586b glosses it as the first spinal process of the neck (βρεχμός λέγεται ἢ τοῦ ἀυχένου σπονδυλώδης ἀρχή); Apollonius (*Lex.* 105-7) suggests that it is the top of the head's circumference, or helmet-cap (ἐπὶ μὲν τοῦ ἄκρου τῆς περικεφαλαίας); Herodianus (*Partitiones* 5.9) defines it as the summit of the head's brain-pan (τὸ ἄκρον τοῦ κρανίου τῆς κεφαλῆς); Pollux (2.39) defines it more loosely as the part of the head above the forehead (τὸ δὲ ὑπὲρ τὸ μέτωπον). Modern scholarship has shed little more light on the meaning of the term. For a summary of this attention to the word see Saunders 2000.

11 Daremberg, however, was building upon an already preexisting early-modern interest in the Homeric understanding of medicine and the human body. For example, in *de Homero Medico* (1700) Adam Brendel attempted to locate Homeric medical knowledge in relation to later writers in antiquity, most notably Hippocrates, Galen, Pliny, and Celsus. Compared to that of Daremberg's, his assessment of Homeric anatomical knowledge was not glowing: '*De anatome vero peritia multa dicere non attinet, quia sauciorum membrorum curatio minus recte institui potest, qui corporis fabricam non habet cognitam. et partium cohaesionem, muniaque, quibus funguntur, ignorat.*' (Brendel 1700: 23).

12 Daremberg 1865: 10-59.

13 Daremberg 1865: 11.

alphabetical, which lexically fragments the terms and discourages our understanding of how the Homeric poems connected the various parts of the body. Discussions for the most frequently occurring terms – those describing more basic parts of the body – tend to receive lengthy treatment, while those that are problematic receive relatively little attention.¹⁴

Frölich's *Die Militärmedizin Homers* (1879) pays more attention to the depth of Homer's anatomical knowledge than to his vocabulary, so the battle scenes of the *Iliad* receive the fullest treatment. As a physician in the German military, Frölich was interested in showing that Homer was not only knowledgeable about medicine and the human body, but also that he was probably a military surgeon who treated injuries off the battlefield. This distance from the actual fighting would have allowed him the chance to pursue his poetry.¹⁵ Frölich arrived at this conclusion from evidence he collected about the types of wounds and mortality rate from the *Iliad*'s descriptions of 147 injuries to different parts of the body. These numbers are divided into the locations of injuries (head, neck, trunk, arm, leg) and the weapon used (stone, spear, arrow, sword), and the mortality rate for each injury is provided. These statistics, Frölich argues, are consistent with the survival odds on his own 19th century battlefield.¹⁶ Modern scholarship has inherited two important points about Homeric anatomical language from Daremberg's and Frölich's works: the poems show a lexicon for the human body that rivalled anatomical vocabulary in many Hippocratic works; and the detailed descriptions of war injuries suggest an understanding of the human body that leaves the impression of some special knowledge.

Frölich's focus on the types and number of battle injuries described in the *Iliad* has received the most attention in later scholarship. His table of wounds, for example, is still often

14 E.g. his entries on βρέχος and γάσπηρ, Daremberg 1865: 17.

15 Frölich 1879: 63-4.

16 Frölich 1879: 58-61.

cited or copied in discussions about Homeric warfare.¹⁷ The natural extension of Frölich's findings (and, to some extent, Daremberg's) has been to enquire into why there is such a high level of detail given in these death scenes. There have been several possible answers. Mueller posits that many of these descriptions are part of character and plot development. Noting the frequency of gory wounds in the *aristeia* of Achilles as an example (*Iliad* 21), he suggests that such detail is added to show the hero's retaliation to and intensification of Patroclus' maltreatment.¹⁸ Fenik holds a similar view that battle scenes are artistic tools of the poet through which he strengthens connections between episodes and characters.¹⁹ It may be that such descriptions are comparable to (and a literary product of) vivid accounts given by hunters after a successful kill.²⁰ It may also be that Homer wished to provide an identity and distinction to the fallen heroes through individualizing their deaths.²¹ Salazar is a particular advocate for this possibility, citing the common description of the *Iliad* as a 'poem of dying and death.'²² Friedrich mirrors Fenik's belief that these battle scenes are for the most part formulaic models inherited from oral poetry; however, he also argues that elaborations upon these models are the result of later additions to the poem.²³

Analysis of Homeric anatomical vocabulary *per se* has been confronted surprisingly less frequently in later scholarship. Daremberg's findings have been primarily cited to suggest that

17 For recent examples see Grmek 1989: 28; Salazar 2000: 127; Mylonas 2008; Gabriel 2007: 136. For a detailed analysis of this table, including its deficiencies see Saunders 2004.

18 Mueller 1984: 86.

19 Fenik 1968. His general conclusion is that battle scenes in the *Iliad* are for the most part formulaic, a result of a long-refined oral tradition. Additions to them are primarily elaborations in detail at the hands of a skilled poet. See also Segal 1971, esp. 1-8.

20 Salazar 2000: 128-135. Kitts 2005: ch.1 suggests a similar connection between descriptions of fatal blows in war and the sacrificing of animals.

21 But this does not account for why only eight or so victims are mentioned in lists. For this number see Mueller 1984:82.

22 Citing Marg 1976: 18; also de Romilly 1979: 3, and Griffin 1980: 44. I add to this Schein's informative survey of this notion (Schein 1984: 67-69) This point is also emphasized by Oswald 2011, who begins her poem memorializing the dead in the *Iliad* with a list of 214 names of those killed.

23 Friedrich 2003.

Homer had a rich vocabulary when describing the human body. Although his work has often been cited as evidence for this, there has been little investigation into his findings and the connection between Homeric and Hippocratic vocabularies. Most studies have been restricted to particular words encountered in the epics and their relationship to later concepts of the body. These will be discussed as they are encountered. Leumann is one of the few authors in the last century to comment upon Homeric medical language. Interested primarily in linguistic features, he remarks that it is unlikely (but not impossible) that medicine borrowed its anatomical terminology directly from poetry. The Homeric poems and Hippocratic writings shared the same non-poetic Ionic origin for anatomical and medical terms, and Leumann uses this to explain their similarities. The implication of this position, that Homeric poets possessed a language for the body that was not originally poetic, is that they had exposure to or interest in the subject that reflects a general Ionic interest in the construction of the human body. Leumann further offers the possibility that the detailed vocabulary found in the poems – for example metaphors and compound words – provided a model for new lexical creation among the blooming scientific communities of the 5th century.²⁴

Further research has been done on smaller aspects of Homeric anatomical language. Mugler in his study of the Homeric poems as a starting point of Greek science only obliquely comments on anatomical language, and this is limited to contexts of anthropomorphic forces applied to the natural world and to notions of cause and effect.²⁵ Roura has pursued the Homeric poems' relation to later Hippocratic writings more thoroughly in his study of the Hippocratics' scientific language.²⁶ Using a small selection of terms from the poems as examples, he categorizes later anatomical vocabulary into three groups: words sharing semantic ambiguity in

24 Leumann 1950: 308-15.

25 Mugler 1963: 37, 110-11. He does, however, spend some time discussing Homeric knowledge of medicines, charms, and poisons (147-52).

26 Roura 1972.

both the poems and Hippocratic writings; words with persistent semantics fields; and Homeric terms whose semantic fields have been specialized or new vocabulary. His findings illustrate some common trends in later scientific language. The narrow scope of his lexical enquiry, however, does not allow for an accurate picture of just how greatly Homeric vocabulary is reflected in the Hippocratic Corpus.²⁷

A common thread in these works is a scholarly interest in just how much the Homeric oral poets knew about anatomy. Frölich's and Daremberg's works continue to remain the primary studies of this. Both emphasized the detailed nature of Homeric anatomical knowledge, and both were medical doctors. The possibility that the poet Homer had special medical knowledge of the human body has been most pursued in the pages of medical journals by physicians seeing ancient similarities to their own craft.²⁸ The general consensus of their findings have been that the *Iliad* accurately portrays anatomy through Homeric description of wounds.²⁹ These conclusions, however, most often rely on an anachronistic view of medicine, which tell us more about our own notions about the art of medicine than those of the oral poetic tradition.

Despite interest in Homeric descriptions of the body, scholars have generally resisted the possibility that people in the Homeric world actively studied the body's construction. The primary basis for this argument has been that medical practices in archaic Greece had yet to move beyond treating the body's surface. Edelstein concludes that while there might have been some anatomical interest when the poems were composed, religious and moral restrictions likely

27 Hippocratic anatomical language and its relation to 5th century authors is explored below in chapter 3.

28 For examples in the areas of general anatomy: Dunbar 1880, Urso 1997; neuroanatomy: Sahlas 2001, Walshe 1997; head and neck trauma: Mylonas 2008, Sapounakis 2007; arm and hand trauma: Lipshutz 1963, Morelli 2007; chest trauma: Santos 2000.

29 A notable exception to these is Godquin 1990, who argues that some descriptions in the poems suggest that Homer did not have surgical experience with the human body, but rather he had assistance for technical terms. In other words, Godquin imagines a situation in which Homer had consulted someone who had special knowledge of internal anatomy to help him compose the detailed descriptions of the body in the poem.

prevented any human autopsy. Moreover, in the absence of any knowledge about internal illness at this time, any attempt to explore the inner body would have been for pure curiosity.³⁰ This opinion is followed by Phillips; however, he allows for the possibility that exposed children and aborted embryos were exempt from such taboos.³¹ Saunders has been the latest author to address anatomy in the *Iliad*. His conclusion is that the Homeric poems are for the most part accurate in their descriptions of wounds, yet there remain some examples where the results of injuries are questionable, what Saunders calls ‘fantastic,’ and these are the passages that have spurred the most interest from antiquity to now.³² It should be noted that Saunders is not so concerned with anatomy as he is with whether the injuries are plausible.

2.2. The Homeric *Kunstsprache* for the body: interpreting terms

There are some anatomical terms that appear to be fantastic to a modern audience. Part of their obscurity is due to the Homeric language itself, which presents problems that later Greek anatomical vocabulary usually does not. In many ways the dialect is a patchwork: in addition to its Ionic character, it also shares similarities with Aeolic and Mycenaean dialects.³³ Very likely, Homeric language was synthetic (a *Kunstsprache*), the result of a long oral tradition.³⁴ The

30 Edelstein 1967: 251-2, *contra* Koerner 1922: 1484. The lack of knowledge about internal medicine in Archaic Greece was already noticed in antiquity. Plato for example notes that Homer had no knowledge of dietetics, the most common treatments in his age (*Ion* 538c, *R.* 406a; see also Eustath. *ad Il.* 11.829). For a discussion of this see Smith 1966: 547-48. The general consensus among scholars is that while certain external wounds were treated with surgery, Homeric medicine was still heavily theurgical. See Cordes 1991 and Kudlien 1965.

31 Phillips 1973: 41.

32 Saunders 1999. Some especially notable examples that he discusses include a spear that quivers, since it is next to Alkathoos’ beating heart (*Il.* 13.428-44); Kebriones’ shattered eye socket that makes his eye fall out (*Il.* 16.732-43); and Archelochos’ decapitation by a spear (*Il.* 14.459-66).

33 The literature on the Homeric dialect is extensive. For an excellent summary see Horrocks 1997, who analyzes the elements of Ionic and Aeolic dialects within the poems. He suggests that this blending was caused by different stages of development within the oral formulaic system. Cf. Wyatt 1988, who argues for the possibility that something similar to Homeric language might actually have been spoken.

34 The compositional stages of the Homeric epics fall into three categories: 1) a foundation of phrase-types developed through a long oral, preliterate, formulaic tradition; 2) elements of innovation by an epic bard at the time of the first written composition (late 8th century); and some additions by later hands (6th century), specifically the Pisistratean recension (see West 1999 and further Haslam 1997: 79-84 for specific discussion of the Pisistratean recension).

literary forms of the *Iliad* and the *Odyssey* might have been far removed from the time and/or places when a word was actively used. If this is so, the exact definition of an anatomical word in its original sense might have been obscure, remaining as a poetic word only. Additionally, the formulaic nature of Homeric verse means that it is impossible to determine the appropriateness of word choices. In one instance, an especially apropos word might be used; in another, a formula might have been used in which the metrical structure favoured a specific word over its proper use.³⁵

Anatomical words in Homeric *Kunstsprache* fall into two categories: those that are contained within formulae and those that are *hapax* (words that appear only once across the *Iliad* and *Odyssey*). Words that appear more than once in the poems are part of fixed formulae that suggest the poet's training in the oral formulaic tradition. Since *hapax* terms are typically additions to the set formulas, they are where the innovative talents of the poet are most evident. If the *Iliad* and *Odyssey* were part of an oral formulaic tradition that relied upon rigidly set patterns of diction and theme, then that leaves limited (or potentially no) opportunities for a poet's artistic abilities to be exhibited; however, work on both Homeric diction – the *Kunstsprache* of his epics – and the study of *hapax legomena* in the poems suggest that there was plenty of room within the confines of the formulaic structure for the poet to make decisions in both plot construction and word-choice.³⁶

35 See Combellack 1959, esp. 208 and Peradotto 1997: 381-84.

36 This claim and my postulations about the state of the Homeric epics are following Hainsworth 1993: 1-31. He provides here several excellent discussions about the fixed-phrasing within the oral formulaic system, as well as the possible avenues for innovation that were available to the poet. See further Sullivan 1995: 3-5 for a short summary of the oral formulaic system particularly in regard to individual anatomical/psychological words. She argues that epic language was in all likelihood not the vernacular of Homer's age; his vocabulary probably was much larger. Furthermore, she argues that '[the] poetic language, having had a long history, probably contained archaic words and phrases no longer in use or considered "quaint" in nature. Even terms common to both languages probably varied in frequency and perhaps even meaning.'

The number of *hapax* anatomical terms in the poems in the form we have today suggests that descriptions of the body were useful opportunities for poetic innovation. Of the 119 body words in the poems,³⁷ there are 21 *hapax legomena*, or just under 18%. The *Iliad* contains 19 *hapax* anatomical words.³⁸ Nearly all of these appear in combat descriptions and refer to internal parts of the body.³⁹ The *Odyssey* contains only two *hapax* body terms (ἄκνηστις and δέρτρον). Neither of these appear in fighting scenes.⁴⁰ This marked difference between the number of *hapax* terms for internal and external parts shows that the Homeric poems provided few unique descriptions of a person's external features. Rather, they offered individual heroes with individual deaths: Amphiclus is the only one to have his tendons (νεῦρα) torn (*Il.* 16.316); Peiros alone has his lung (πνεύμων) pierced (*Il.* 4.528). Although they are minor characters in the poem, both receive a special (and memorable) death.

In most cases when an anatomical term is not *hapax* in the poems, the Homeric anatomical lexicon appears to be internally consistent and to be framed around categories for classifying body parts. When describing the body the Homeric tradition does not exceed the semantic scope of a particular term, but instead has a defined physical or material continuum in mind for what a term can denote. A *physical continuum* of lexical scope refers to what we call a 'part,' such as the English term '(right) leg' or '(left) forearm.' A *material continuum* refers to

37 See Appendix 1 for the complete list of Homeric anatomical vocabulary.

38 ἀσφάραγος (*throat/gullet*, 22.328), βουβῶν (*groin*, 4.492), βρέχμος (possibly *sinciput* [crown of the head], 5.576), ἔνδυνα (*entrails*, 23.806), ἐπισκύνιον (*eyebrow*, 17.136), θέναρ (*palm of the hand*, 5.339), ἰγνύη (*ham/back of the thigh*, 13.212), κοτύλη (*hip joint*, 5.306), κρανίον (*skull/cranium*, 8.84), κώληψ (*hollow of the knee*, 23.726), νεῦρα (*tendons*, 16.315) νήδυια (*bowels*, 17.524), πνεύμων (*lung*, 4.528), πρόμησις (*waist*, 11.424), ῥάχης (*lower back/chine*, 9.208), σκέλος (*leg*, 16.314), σφονδυλῖος (*vertebra*, 20.483), ὑπερώη (*palate*, 22.495), φλέψ (*vessel as in later Greek or perhaps spine* [Janko 1992 *ad loc.*], 13.546). Cf. the adjective ἐπινεφρίδιος (*upon the kidney*, referring to the fat [δημός] surrounding the kidney, *Il.* 21.204).

39 The two exceptions are ἐπισκύνιον (*eyebrow*, 17.136), the furrowed brow in a lion simile; and ῥάχης (*lower back/chine*, 9.208), of a butchered pig.

40 ἄκνηστις (*spine/backbone*, 10.161, although possibly a misreading of κατὰ κνήστιν [LSJ *s.v.* ἄκνηστις]; κνήστις (*spine*) would also be a *hapax*) appears in a description of Odysseus' killing of a stag; δέρτρον (*caul/membrane containing the bowels*, 11.579) is used by Odysseus to describe Tityos' evisceration by two vultures in the underworld. The term χορδή (*gut*) at 21.407 could also be added, although it here refers to the string of a phorminx.

the material makeup of a part that may be shared with otherwise conceptually different parts. In English we have ‘muscle’ and ‘bone’ as examples of this. Inherent to all languages, however, are unclear or ‘fuzzy’ boundaries in the semantic field of some words, including words for the body.⁴¹ For example, it is difficult to place fixed spatial limits on parts that we in English call ‘abdomen’ or ‘cheek.’ In these cases, a term is either applied to something that is itself poorly defined or is used in such a way that there is ambiguity about its meaning. A person or a language group will use these words at times in a very restricted sense, while at other times use them in ways that seem to push a word’s semantic limits.⁴²

The difficulty of interpreting Homeric anatomical terms occurs when they appear either infrequently or in formulae that are too restricted to glean much about their meanings. For a simple example, the Homeric term ἀγοστός (which can be glossed as ‘flat of the hand,’ *s.v.* LSJ), which always appears in the same *sedes*, provides too little contextual differentiation for us to develop a precise meaning for the word:

ὁ δ' ἐν κονίησι πεσὼν ἔλε γαῖαν ἀγοστῶ.

he crashed in the dust and [with the flat of his hand] clawed the earth.⁴³

Context suggests that the ἀγοστός very well could be the flat of a falling hero’s hand that hits the ground, but it could also be another part of the arm (or even another part of the body). Little help can be found in later uses of the term. It does not appear again until the Hellenistic period, when it is used for ‘arm’ (Theoc. 17.129) or strangely even ‘dirt’ (Σ *ad Il.* 6.506; cf. *s.v.* LSJ).⁴⁴

41 See Brown 1979 for discussion of this idea.

42 See Lander *et al.* 1962 for a study of fuzzy semantic fields for the limbs and torso in modern Navaho, and further Brown 1979 for discussion of this phenomenon and its role in the semantic change of anatomical terms.

43 *Il.* 11.425, 13.508, 520, 14.452, 17.315. In this chapter I use, with minor changes, the translations of Hammond (*Iliad*) and Palmer (*Odyssey*).

44 The scholiast apparently confused ἀγοστός as an anatomical term with what it is described as touching within the formula, i.e. the *dirt/dust* (κονία).

This reappearance of the term seems to be due to the focussed academic interest not only in the writings, but also in the language, of the Homeric epics.⁴⁵

The example of ἄγροστός illustrates part of the problem that Homeric formulaic language presents: metrical convenience and fixed phrase-forms sometimes hinder attempts to define a body term in a given context. Lexicographers have recourse to etymology and later uses of a term, but although these are helpful for providing possible options of meaning, these methods are by no means exhaustive or definitive. Epic anatomical language thus presents us with a descriptive picture of the body that is part known and part unknown. Like the human body, when put under close examination, some Homeric terms – to both later Greek authors and to us – become unsettlingly strange.

2.3. The human body as a whole: δέμας and σῶμα

This strange impression of human anatomy is perhaps most apparent in the search for a Homeric word for the whole body. By the middle of this past century research into the Homeric understanding of the relationship between the material body and the self suggested there was a detectable difference between the Homeric tradition's understanding of the body and our own. I am not concerned here with the broader question of the distinction made between the psychic self and material self in the poems. However, investigations into part of this problem – how (or even whether) the Homeric poems describe the whole living body – are relevant, since any conclusion suggests a way of describing the body in the poems that differs from our own.

Snell's *The Discovery of the Mind* is the starting-point for modern scholarship about concepts of the self in the Homeric poems. His chapter on Homeric anthropology concludes that

45 As Hunter 2006: 249-50 writes: 'Many Alexandrian poets, most notably Callimachus and Apollonius, were also professionally engaged with the study and interpretation of Homer's text and their poetry reacts to that of Homer at every turn; the scholastic mode fashions allusions to Homer as a shared code which binds the poet to his audience.'

the Homeric world perceived the body as a collection of parts that essentially operate independently toward a common purpose. The main evidence that Snell used to support this claim is the apparent absence of any clear term in Homeric Greek to refer to the whole of a living person.⁴⁶ Following Aristarchus,⁴⁷ he states that the word σῶμα (used later to mean the ‘living body’ as well as ‘dead body’) appears in Homeric Greek to mean only ‘corpse.’⁴⁸ When Homer wished to speak of the living body he would instead either refer synecdochically to someone’s γυῖα (‘limbs’) or to someone’s δέμας (‘bodily frame,’ used only in the accusative of respect).⁴⁹

Contrary to Snell’s conclusions, from the available – albeit limited – evidence, it appears that the poems do describe something similar to our term ‘body’ in a way that shows a clear understanding of it. Focusing on the appearance of σῶμα in the epics, Renehan has argued that Snell was relying upon too few appearances of the word to make such an overarching speculation about early Greek concepts of humans.⁵⁰ He specifically contends that it is possible that two of the eight cases of σῶμα in the Homeric epics may in fact refer to living bodies. The first is a description of Paris’ body hunted like a stag by Menelaus (*Il.* 3.23). The second is the bodies of Odysseus’ crew as they are cast overboard while sailing past the Planktai (*Od.* 12.67).⁵¹ Porter has a similarly negative view of Snell’s model; however, his disagreement is based on the

46 Snell 1953: 5-8.

47 Cited in Apollodorus, *Lex.* 254: σῶμα Ὅμηρος οὐδέποτε ἐπὶ τοῦ ζῶοντος εἴρηκεν.

48 The earliest example where σῶμα is clearly used for the living human body is at Hes. *Op.* 539-40: τὴν περίεσσασθαι, ἵνα τοι τρίχες ἀτρεμέωσι / μηδ’ ὀρθαὶ φρίσσωσιν ἀειρόμεναι κατὰ σῶμα· (‘clothe yourself in this [chiton] so that your hairs neither tremble nor bristle and stand up straight all over your body.’). See West 1978 *ad loc.* for discussion.

49 Thus we read that Cassandra was the same as Clytemnestra (*Il.* 1.115); Tydeus was small (*Il.* 5.801); and Apollo appears as the herald Periphas (*Il.* 17.323), each in respect to his or her δέμας. Supporters of Snell’s theory – at least in a weak form – include Adkins, du Bois, and Bolens, all of whom for different reasons argue for the high articulation of the Homeric body. Adkins 1970: 21 argues that the fractured Homeric body is based on some analogy with the social organization of Homeric society; du Bois 1996: 28-29 is primarily concerned with the fragmented descriptions of the body in later poetry; and Bolens 2000: 55 wishes to show that a similar process of articulation is found in most early Western cultures.

50 For a similar conclusion, although one more sympathetic toward Snell, see Koller 1958: 277.

51 The other appearances of σῶμα are at *Il.* 7.79, 18.161, 22.342, 23.169; *Od.* 11.53, 24.187.

belief that Snell sees the Homeric person's understanding of the world as primitive and childlike in comparison to our own.⁵² Williams also rejects Snell's claims on the basis that a hero's corpse (νέκυς) is sometimes indistinguishable from his former living body.⁵³ Holmes in her more nuanced assessment has recently refined Snell's definition of σῶμα by suggesting that it refers to dead bodies 'that have been abandoned, forgotten, or are otherwise *akêdea* [uncared for].' Furthermore, she argues that in the specific case of Paris' σῶμα, metaphorically that of a stag, the term stresses the body's edibility.⁵⁴

Holmes' reinterpretation of σῶμα as 'the uncared for' corpse is especially attractive. It first aids in explaining the interpreted semantic overlap of the word with νεκρός (νέκυς), 'corpse.'⁵⁵ Making a person an edible thing does violence to norms of proper burial and treatment, and hence shows an intense disregard for the person. Secondly, as I show in my discussion of 'flesh' words (σάρξ/κρέας) below, terms usually used for animals, the Homeric poems show a tendency to distinguish between the unbroken self and the corrupted body. A corpse is a non-living person: one deprived of life. When exposed to violence and resulting death by either beast or human, a person is not only in the state of 'not being,' but also in a sense 'not (or no longer) human.' He has lost his life and his identity as a human by suffering the death and subsequent treatment suitable for a beast.

A description of what the σῶμα may have been to a Homeric audience still does not fully address Snell's conclusion that the body in the Homeric world could only be seen as a collection

52 Porter 2002: 68. An explicit example of this is Snell's comparison between the articulated representations of man seen in geometric art and the minimalistic drawings of children (1953: 7).

53 Williams 1993: 24-25 and n. 7. He draws particular attention to Hermes' comments on Hector's corpse at *Il.* 24.422-23: ὥς τοι κήδονται μάκαρες θεοὶ υἱὸς ἔηος / καὶ νέκυός περ ἔόντος ('Thus do the blessed gods care for your [Priam's] son, although he is a corpse').

54 Holmes 2010a: 32-33.

55 This is one of Renehan's contentions against rendering σῶμα as 'corpse' (1979: 278).

of parts. From the absence of an English equivalent for the unified ‘body’⁵⁶ in the Homeric epics we can not assume that the Dark Age/Archaic Greek failed to conceive of it in such a way.⁵⁷ In matters of practical expression, the poems clearly define the boundaries of the human body and describe it in meaningful ways: a Homeric hero is a (single) ἄνθρωπος (*human*, e.g. *Il.* 16.263) and ἄνῆρ (*man*, e.g. *Il.* 1.144) who is θνητός (*mortal*, e.g. *Il.* 13.322).⁵⁸ Regardless of whether or not there is a lexical equivalent in Homeric Greek for our term ‘body,’ the hero is a complete phenomenological unit that is distinct from any other ‘thing.’

What Snell’s observation possibly does suggest is that Homeric Greek felt no need to speak this way about the whole body, since the concept of the ‘whole of a human’ was likely implicit when talking about a person. This is an important and tenable supposition with its own ramifications:

[T]o seek a word for ‘body’ is to ask Homer a wrong and unanswerable question. That a man should have a body makes sense only if he has another part to be distinguished from it: soul, mind, the ghost in the machine.⁵⁹

In the epics there appears to be an absence of any discernible part of a human that is not material in some form or other: there is no ‘ghost in the machine.’ Although Snell’s interest in the function and the definition of δέμας within the epics is well-placed, it seems to be based on a

56 The English origin and original meaning of ‘body’ are in themselves difficult questions. The *OED* (s.v. ‘body’) suggests that it is cognate with German terms meaning corpse, body, and trunk (of the body), but adds that any further etymology is unknown.

57 For this view see Gaskin 1990, esp. 3-4. See also Renehan 1979: 276: ‘The *argumentum e silentio* should not be used indiscriminately in attempts to reconstruct Homeric beliefs.’

58 Further evidence may be found in the epithet for a type of shield described in the poems: ἄσπις ἀμφιβρότη (‘man-surrounding shield’), which is seemingly the same as calling it an ἄσπις ἀμφισωματική (‘body-surrounding shield’). The term ἄσπις ἀμφιβρότη is used frequently (see for examples *Il.* 2.389, 12.402). It is the mortal man as a complete unity (βροτός) who is surrounded by the shield, and to the Homeric mind this is probably in no way different from saying that it is his body (σῶμα) which is protected. Sullivan 1988: 10 shares a similar understanding of a unified ‘self’ in the poems, but from the position of mental activity: ‘Homeric man does not seem merely to be moulded by external factors or by inner psychic entities influenced by such factors. Thus, for example, in wishing to make some choice, he may address his *thumos*, but *thumos* itself does not then completely take over and provide the decision. The person himself seems to be somehow involved in both the process of choice and the resulting action.’

59 Clarke 1999: 118-19.

modern Western need to have a specific term that denotes a strictly material substance, one that can be separated from any psychological or spiritual centre (i.e. the mind or soul) that unifies the whole.

The merit of Snell's study of the δέμας in the Homeric poems is not that he provided evidence for a vastly different way of thinking about the body. Rather, the value is in his more basic suggestion that Dark Age Greeks might have had other interests that reflected how they expressed the body. The Homeric body probably was not so divided that its pieces could not be assembled together to form a whole person; the assembly was implicit. This implied – or perhaps conspicuously absent – body in the poems is itself meaningful, since it illustrates how different approaches to the body (here in the epics a strictly material entity) affect the choice of words used to describe it. In the poems, living bodies are important because of what they did or what was done to them: a hero could kill with his hands or could be killed by having any number of his parts corrupted. As a result, the various parts involved in these actions – faces, skin, limbs, and internal parts – receive the most attention. On the other hand, a corpse or body at the point of death, especially one that is uncared for, remains inactive and neglected, and thus is reducible to a single mass, or σῶμα.

2.4. The ruptured body: the orifices and skin, χρώς

The Homeric poems of course describe characters in more detail than at the level of the whole body. In these instances, a person becomes fragmented to varying degrees. In order to describe the condition of a character's material self, it is necessary to look beyond the δέμας or σῶμα. For this to occur there must be a change in the way the body is viewed. In this second way of perceiving the body, it is necessary in some instances to break down the whole body into parts and to look beyond the externally visible body.

One particularly rich area of terminology used to do this is language for the face. Such descriptions are often used to relate a character's appearance and emotional state. Similar vocabulary is also used in battle descriptions when attacks are directed at a hero's face. This overlap between terms used to define a living person and those used to describe a dying or dead one shows the ability of such vocabulary both to inform identity and to obscure it.

The *Iliad* and the *Odyssey* contain 26 different terms for parts or divisions of the head.⁶⁰ These are useful terms for describing physical features (generally, a person's ὄψις or 'countenance') and for suggesting emotional states. For example, facial expressions are used to suggest fortitude (*Il.* 17.135-7):

ὃ δέ τε σθένει βλεμεαίνει,
πᾶν δέ τ' ἐπισκύνιον κάτω ἔλκεται ὄσσε καλύπτων·
ὡς Αἴας περὶ Πατρόκλω ἥρωϊ βεβήκει.

He stands glorying in his power, and draws down all his brow in a frown that hoods his eyes. So Aias stood in defence of the hero Patroklos.

or concealed emotions (*Il.* 15.101-2):

ἦ δ' ἐγέλασσε
χείλεσιν, οὐδὲ μέτωπον ἐπ' ὄφρῦσι κυανέησιν
ἰάνθη·

[Hera] smiled with her lips, but on her forehead above her dark brows there was no softening.

However, terms for the head and body are also frequently used to describe superficial points of impact and injury (*Il.* 14.493-95):

τὸν τόθ' ὑπ' ὄφρῦος οὐτα κατ' ὀφθαλμοῖο θέμεθλα,
ἐκ δ' ὡσε γλήνην· δόρυ δ' ὀφθαλμοῖο διὰ πρό
καὶ διὰ ἰνίου ἦλθεν

⁶⁰ ἀνθερεών (chin), βλέφαρα (eyebrow), βρέχμος (sinciput), γένειον (chin), γλήνη (eyeball), γλωσσα (tongue), γναθμός (γένυς) (jaw), ἐπισκύνιον (eyelid), κάρη (head), κεφαλή (head), κορή (pupil), κόρη (temple), κρανίον (brain pan), κρόταφος (side of face), μετώπιον (space between eyes), ὀδούς (tooth), ὄσσε (eye), οὖς (ear), ὀφθαλμός (eye), ὄφρῦς (eyebrow), παρειαί πρόσσωπον (face), ρίς (nose), στόμα (mouth), ὑπερώη (palate), χεῖλος (lip).

[Peneleos] struck [Ilioneus] under the brow at the base of the eye [socket],⁶¹ and knocked out the eye-ball. The spear passes right through the eye-socket and came out through the muscle of the neck.

and *Iliad* 16.404-5:

δ' ἔγχει νύξε παραστάς
γναθμὸν δεξιτερόν, διὰ δ' αὐτοῦ πείρεν ὀδόντων

[Patroklos] came up and stabbed [Thestor] with his spear in the right side of the jaw, piercing on through the teeth

In examples of facial injuries such as these, the poems commonly focus on the orifices of the eyes (ὄσσε, ὀφθαλμός), ears (οὔσα), and mouth (στόμα), and their surrounding areas.⁶² These points of impact would have been particularly fatal, and are thus effective locations for a hero to deliver a blow. A statistical analysis by Sapounakis suggests that the Homeric tradition was well aware of this. Of the 32 head injuries described in the *Iliad*, 29 result in death.⁶³

When a hero is wounded in places other than the head, there is a different type of rupture between external and internal parts. In these instances a weapon does not access the interior through a natural opening such as an eye or the mouth. Instead, the weapon must penetrate the skin, thereby forcing its own entry point. The skin in the Homeric poems therefore is significant for being the barrier between both the visible body and invisible body as well as between life and death; however, this 'skin' (χρῶς) represents a nebulous zone of the body that can have a variety of meanings that do not appear to correspond to the English gloss.

Achilles' killing of Hector in *Iliad* 22 is an excellent example of the rupture between the exterior and interior body. Achilles finds an opening not on the body's surface but in his opponent's armour that will allow access to the body's surface: his 'beautiful *chrōs*' (χρῶς

61 Although commonly used to mean the eye *in situ*, it perhaps had the original meaning of the eye socket (Wharton *s.v.* ὀφθαλμός = chamber of the eye); but according to Frisk (*s.v.* ὀφθαλμός) and Chantraine (*s.v.* ὄπωπα), the term has the dialectic variant ὀκταλλός (Boeotian) and both are ultimately derived from PIE.

62 Eyes (ὄσσε, ὀφθαλμός): e.g. *Il.* 5.291, 14.493, and 16.349, 741; ears (οὔσα): *Il.* 11.107-9 and 13.177-81; mouth (στόμα): 14.467, 15.345 and 389, and 16.345.

63 Sapounakis 2007: 113. Of the remaining three incidents two are non-lethal (11.350-59, 12.320-31) and one is uncertain (5.580-8).

καλός, 21.321). Just as Hector's armour forms the barrier between his body and Achilles' spear, his *χρῶς καλός* is the liminal point that separates the outer world from his inner (vital) self. If Achilles wants to take the life of Hector, he must transgress this final exterior defence of his enemy's body.

The term *χρῶς* represents an important concept of Homeric anthropology. Like *δέμας*, the word lacks an easy English equivalent. The LSJ translates it as either 'skin or flesh' or 'the colour of the skin'; Cunliffe translates it as 'the flesh of the body.' All these translations are suitable in specific contexts, which makes the *χρῶς* of special interest: it seems to be used interchangeably in both a superficial sense and one suggesting depth and substance.⁶⁴ Thus the *χρῶς* can be washed (*Od.* 24.43-45):

αὐτὰρ ἐπεὶ σ' ἐπὶ νῆας ἐνείκαμεν ἐκ πολέμοιο,
κάτθεμεν ἐν λεχέεσσι, καθήραντες χροά καλὸν
ὔδατί τε λιαρῶ

And after we had borne you [Achilles] to the ships from out of the fight, we laid you on a bier and washed your handsome *chrōs* with warm water

or anointed (*Il.* 14.170-72):

ἀμβροσίη μὲν πρῶτον ἀπὸ χροὸς ἱμερόεντος
λύματα πάντα κάθηρεν, ἀλείψατο δὲ λίπ' ἐλαίῳ
ἀμβροσίῳ ἐδανῶ, τό ρά οἱ τεθυωμένον ἦεν·

First [Athena] used ambrosia to wash every stain from her lovely *chrōs*, and then she rubbed herself richly with oil of immortal sweetness.

These uses (although they could be translated as 'body') suggest a liminal meaning of the term similar to our 'skin'; however, the *χρῶς* can also have substantial depth that we would be inclined to call 'flesh.' This meaning of the term usually occurs when the body is pierced by a weapon: ἀκρότατον δ' ἄρ' οἰστός ἐπέγραψε χροά φωτός· ('and the arrow scratched the very surface of the man's [Agamemnon's] *chrōs*' *Il.* 4.139); or Teucros to Agamemnon (*Il.* 297-98):

⁶⁴ There is similar difficulty in defining the Egyptian term *h^c*, which like *χρῶς* has been alternatively translated as 'body,' 'flesh,' and 'skin.' See Walker 1996: 3-10.

ὀκτὼ δὲ προέηκα τανυγλώχινας οἰστούς,
πάντες δ' ἐν χροῖ πῆχθεν ἀρηιθῶων αἰζηῶν.

I have shot eight long-barbed arrows, and every one of them has fixed in the *chrōs* of a quick young warrior.

In these examples, the translations ‘skin’ and ‘flesh’ could both fit well. In other places, though, it seems that ‘skin’ is perhaps insufficient (*Il.* 11.435-38):

διὰ μὲν ἀσπίδος ἦλθε φαεινῆς ὄβριμον ἔγχος,
καὶ διὰ θώρηκος πολυδαιδάλου ἠρήρειστο,
πάντα δ' ἀπὸ πλευρῶν χροῶα ἔργαθεν, οὐδ' ἔτ' ἔασε
Παλλὰς Ἀθηναίη μιχθήμεναι ἔγκασσι φωτός.

Through the bright shield the strong spear went, and on through the worked corselet, forcing its way. It stripped all the *chrōs* from [Odysseus'] ribs, but Pallas Athena would not let it go on to sink into the man's *innards*.

Although it is possible that the translation of ‘skin’ for χροῶς could work in this instance too, the addition of ἔγκατα (*innards*⁶⁵) allows for the possibility that χροῶς is more than the covering: it can be interpreted as including the skin, fat, and flesh, or all that is not within the cavity of the body.⁶⁶

This abstraction and consequent estrangement of the χροῶς from the human body is evidence of a larger underpinning conceptualization of the body at work. The χροῶς is, for all general purposes, a qualitative dimension of the δέμας as a unified whole, so long as it remains

65 Likely a generic name for everything that is within the chest cavity. See p. 57 n. 93 below for discussion.

66 Cf. at *Od.* 5.435 in a simile of an octopus, Odysseus's skin is described as being scraped off by the rocks. The anatomical term, however, is not χροῶς but ῥίνος, which is used in the Homeric epics for loose skin, and not the body's intact surface that can be pierced. Such passages have led Gavrylenko 2005 in her thorough study of the term to interpret χροῶς as a potential substitute for δέμας. Like εἶδος, it represents the part of a person that can be visibly observed and thus, in a very loose way, can stand for the entire body. In this context it represents the surface quality of the skin (cf. Grm. Körperoberfläche) that is different from the material itself. (So in *Od.* 14.24: δέρμα βόειον εὐχροές, ‘the fair-skinned [i.e. surfaced] hide of a bull.’) Unlike δέμας though, it is usually a specific part of a more complex body. It can be torn and pierced, and it can shrivel on the body's frame. The χροῶς enshrouds the inner mass of the body, protecting it. A change occurs when it is detached or removed from the living body. It becomes something foreign and dead; it becomes leather. The poems invariably have the terms δέρμα or ῥίνος to describe this removed (or removable) top layer of an animal. Δέρμα is usually used to mean the detached hide of animals (e.g. lion: *Il.* 10.23; bull: *Od.* 22.362; boar: *Il.* 9.548). It is used only twice in reference to humans. In each occasion the word refers to detached skin, either torn by a wound (*Il.* 16.341) or the wrinkled skin Athena places upon Odysseus as a disguise (*Od.* 13.431). Likewise, ῥίνος is rarely used for humans. When it is, it is either the torn skin of a living person (*Il.* 5.308; *Od.* 5.435, 22.478) or the shrivelled skin of a corpse (*Od.* 12.46).

in its perfect state. It is an unbroken two-dimensional sheet wrapped in three-dimensional space that represents the barrier between us and the rest of the world. At the level of daily experience the skin stands *pars pro toto* for the whole of the body, since it is essentially the only part that our senses of sight and touch are able to access. We can thus presume that it would have been quite natural for a Homeric Greek at times to say *χρῶς* when he meant a person's whole, since, for most intents and purposes, it is: it is the accessible body.⁶⁷ This illusion of a visually uniform body is maintained until the moment it is opened. When it becomes pierced, the illusion of unification is broken along with the surface of the skin. At this point we are confronted with the strange new broken and divided body that exposes its individual parts to examination.

2.5. The internal body

2.5.1. Flesh and tendons

The Homeric poems reveal a detailed understanding of the material immediately beneath the skin, albeit one that does not match well with our own modern anatomical understanding. Epic terms for these body parts are often tied to their function. For example, there are two principal words that represent the general parts of articulation (*γυῖα*) and strength (*μέλεα*) in a human's limbs; three more words describe the specific parts that provide power and movement to the body (*νεῦρον*, *τένων*, *ἴνες*). The epics also have specific words for animal fat (*δημός*, *στέαρ*)⁶⁸ and flesh (*σάρξ*, *κρέας*);⁶⁹ however, these are used only a handful of times for humans, usually

67 E.g. *Il.* 11.398 (after removing an arrow from his foot, Diomedes feels pain through his *χρῶς*), 13.601 (Menelaus removes the armour from Peisander's *χρῶς*), 14.406 (Hector's *χρῶς* protected by armour), 19.33 (the *χρῶς* [corpse] of Patroclus); *Od.* 6.224 (Odysseus washing his *χρῶς*).

68 *δημός*: of cattle (*Il.* 8.240) and of sheep (*Il.* 22.501); placed in the funeral urn of Patroclus (*Il.* 23.168). *στέαρ*: *Od.* 21.178, 83 (for tallow used to grease Odysseus' bow).

69 *κρέας* is the *verbum proprium* in the poems for prepared flesh as food, appearing frequently in the epics, e.g. *Il.* 4.345, 24.626; *Od.* 10.184, 12.30.

when a hero is dead and reduced to an inactive, material state. In these places, he is verbally dissected – or, perhaps more correctly, butchered – and is made edible.⁷⁰

The restricted use of σάρξ and κρέας (*flesh*) within the poems to refer to something dead, either food or part of a carcass, suggests that no animate force is ascribed to this material. In most instances where the poems describe the internal body, the descriptions focus on those parts that provide strength: the animating mechanical materials of a hero. In this capacity the flesh as σάρξ and κρέας appears to play no role in movement or strength.

The apparent meanings of these terms do not match well with our own understanding of ‘muscle.’ Another term (μῦς, μυών) may come closer to this idea, but it still does not fully capture the relationship between muscle and force that we understand. It appears twice in the epics (*Il.* 16.313-15):

Φυλείδης δ’ Ἄμφικλον ἐφορμηθέντα δοκεύσας
ἔφθη ὀρεξάμενος πρυμνὸν σέλος, ἔνθα πάχιστος
μυῶν ἀνθρώπου πέλεται·

Meges, son of Phyleus, watched for Amphiklos to charge, then took him first with a thrust at the top of his leg, where a man’s flesh is the thickest.

and 9 lines later (*Il.* 16.323-24):

πρυμνὸν δὲ βραχίονα δουρὸς ἀκωκὴ
δρύψ’ ἀπὸ μυώνων

[Thrasymedes caught Maris first with a quick thrust to the shoulder]...the spear-point tore the arm away from its flesh at the base.

Here again, there is no hint that these muscles in the leg or arm are sources of strength. The terms μῦς and μυών appear to be distinguished from flesh (σάρξ) only by the comparative mass

⁷⁰ σάρξ when applied to humans is most often used to describe the flesh of a dead man: as food for birds and dogs, *Il.* 8.380, 13.832; as food for Polyphemus, *Od.* 9.293; the burnt flesh on a pyre, *Od.* 11.219. Twice in book 19 of the *Odyssey*, however, the term is used of living flesh, once before the fight between Irus and Odysseus when Irus’ flesh trembles (405) and again just a short time later to describe the torn flesh Odysseus suffers from the boar’s tusk. (450). δημός appears twice with σάρξ describing a Trojan corpse eaten by dogs and birds (*Il.* 8.380, 13.832). κρέας is only used for human flesh in the *Odyssey*, again of Polyphemus’ human meal (*Od.* 9.297, 347: ἀνδρόμεα κρέα – the adjective accentuates the unusual use of the noun to apply to human flesh).

of the flesh being described. The gluteal region and the deltoid are among the largest muscle-groups in the human body, and this prominence encourages differentiation. Distinctions between *μῦς* in the sense that we mean it (general fibrous tissues in the body that either produce movement or hold other structures in place) and *σάρξ/κρέας* (*flesh/meat*) is a later and probably medical development.⁷¹

In the Homeric poems, the primary systems of kinetics of the human body are located in the *γυῖα* and *μέλεα*, which are respectively the gross systems of articulation and power. The LSJ translates both of these terms as ‘limb.’ Snell, however, draws a finer distinction between the two words: the *γυῖα* represent the limbs in their functional form as articulators or ‘bends,’ while the *μέλεα* represent the limbs in respect to their muscular function. This divergence in the definitions again, like *χρῶς* above, illustrates the potential difficulties in translating anatomical words. The term *γυῖα* always appears in the plural and usually in the motif of a hero’s limbs being made more agile (lit. *lighter*; *ἐλαφρά*) (*Il.* 5.122-23):

“Ὡς ἔφατ’ εὐχόμενος· τοῦ δ’ ἔκλυε Παλλὰς Ἀθήνη,
γυῖα δ’ ἔθηκεν ἐλαφρά, πόδας καὶ χεῖρας ὑπερθεν·

So [Diomedes] spoke in prayer. And Pallas Athena heard him, and made his limbs light, his legs and arms above.

or in the event of losing (*λύεσθαι*) strength or support in the limbs, as in the case of death (*Il.* 7.12-13):

Ἐκτωρ δ’ Ἡιονῆα βάλ’ ἔγχρῃ ὀξυόεντι
αὐχέν’ ὑπὸ στεφάνης εὐχάλκου, λύντο δὲ *γυῖα*.

And Hector with his sharp spear hit [Eioneus] in the neck, under his helmet’s strong bronze rim, and his limbs went slack.

71 Kuriyama 1999: 130; and further Shanks 2002, although Kuriyama (129) is wrong that Homeric poems never mention the term *μῦς*.

Other instances of the $\gamma\upsilon\hat{\iota}\alpha$ suggest a meaning that is closer to our English ‘limbs,’ yet the underlying sense of their roles as ‘articulators’ or locations of strength are preserved. Thus at *Iliad* 23.627-28:

οὐ γὰρ ἔτ’ ἔμπεδα $\gamma\upsilon\hat{\iota}\alpha$ φίλος πόδες, οὐδέ τι χεῖρες
ὤμων ἀμφοτέρωθεν ἐπαΐσσονται ἔλαφραί.

My limbs are no longer firm as they once were, neither legs nor arms – my arms cannot now shoot freely out from my shoulders.

and at *Iliad* 13.512-13:

οὐ γὰρ ἔτ’ ἔμπεδα $\gamma\upsilon\hat{\iota}\alpha$ ποδῶν ἦν ὀρμηθέντι,
οὔτ’ ἄρ’ ἐπαΐξαι μεθ’ ἑὸν βέλος οὔτ’ ἀλέασθαι.

His limbs of his feet [i.e. his legs] were no longer fit for a quick dash, either to charge in after his own spear-cast or avoid another’s.

In these two examples the $\gamma\upsilon\hat{\iota}\alpha$ appear to be active parts of the πόδες that provide support. At *Iliad* 13.512 they are described as a part of the feet. In both examples the $\gamma\upsilon\hat{\iota}\alpha$ are ἔμπεδα (‘firm,’ ‘secure’). When they fail, they cause both the arms and the legs to lose their supportive strength. This function is isolated at the joints, and the corporeality is less important than the physiology; the emphasis is naturally thrown on the points of articulation in their functional capacity.⁷²

The term μέλεα, to draw a distinction from $\gamma\upsilon\hat{\iota}\alpha$, is more clearly described in relation to other anatomical parts of the limbs. Hair can grow on the μέλεα (*Il.* 24.359); they are the location of sinew (ἴνες: *Il.* 11.294 and 669; *Od.* 21.283); and they are the place of flesh (σάρξ: *Od.* 18.77). Other references suggest that the μέλεα are beneath the skin, located below both the δέρμα (*Od.* 13.432) and χρώς (*Il.* 23.191; *Od.* 13.398, 430). This use of μέλεα seems to suggest that its meaning is not based on its material composition (i.e. it is not a simple structure

72 This explanation is further supported by the term’s etymological connection to the verb $\gamma\upsilon\hat{\iota}\omega\hat{\nu}$ (‘to bend’) and adjective $\gamma\upsilon\rho\acute{o}\varsigma$ (‘bent’). See Frisk *s.v.* $\gamma\upsilon\hat{\iota}\alpha$ and Chantraine *s.v.* $\gamma\acute{\upsilon}\eta$ (4).

like muscles or tendons) as much as it is on its function. The μέλεα are a collection of these things that when put together provide strength.

These two systems of strength and articulation are sub-divided into 1) the material stretching and pulling parts (νεῦρον, τένων, ἴνες), the active material of the μέλεα, that 2) are articulated at the joints (γόνυ, ἀγκών, ἀστράγαλος, etc.), which are the active material of the γυῖα. The bones (ὀστέα) provide the frame for both. As Odysseus' mother tells him (*Od.*

11.218-19):

ἀλλ' αὐτὴ δίκη ἐστὶ βροτῶν, ὅτε τίς κε θάνησιν.
οὐ γὰρ ἔτι σάρκας τε καὶ ὀστέα ἴνες ἔχουσιν

this is the way with mortals when they die: the sinews then no longer hold the flesh and bone together; for these the strong force of the blazing fire destroys.

The Homeric poems show an understanding of the superficially visible parts that provide force to the joints. Of these the τένοντες and νεῦρα are the most clearly defined. The τένοντες (from τείνειν 'to stretch') appear in some instances to mean 'tendons,' the Achilles tendons (*Il.* 4.521, 22.396), the ligaments of the forearm (*Il.* 20.478), and the hamstring (*Il.* 5.307); however, the term is also probably used for the muscle-group at the back of the neck (*Il.* 14.465-66):

τόν ῥ' ἔβαλεν κεφαλῆς τε καὶ αὐχένος ἐν συνοχμῶ,
νείατον ἀστράγαλον, ἀπὸ δ' ἄμφω κέρσε τένοντε.

[Ajax] hit [Archelochos] at the joint of the head and the neck, on the topmost vertebra, and sheared through both tendons.

The result is Archelochos' decapitation. There are no 'tendons' in this area of the neck as we understand them; however, there are two prominent cord-like muscles that we can feel on either side of the back of our necks known as the sternocleidomastoid.⁷³ It seems plausible the term

73 Saunders 1999: 358 identifies this muscle group in his discussion of the passage but rules it out, since he argues that in order for the injury to be possible (i.e. the head becoming severed), the spine must be severed causing his head to drop forward. In his medical opinion, this would not happen if the sternocleidomastoids were severed (but he can offer no exact explanation of what these τένοντε are). *Pace* Saunders' excellent discussion, however, it is equally possible (and perhaps more probable) that the passage reflects an accurate knowledge of anatomy to describe a fantastic injury.

refers to ‘cord-like’ things rather than ‘tendons.’ The term νεῦρα (*cord*) is *hapax* in the epics (*Il.* 16.316), and like the τένοντε at *Iliad* 5.307 describes the hamstrings. These two cord-like structures, the νεῦρα and τένοντες, provide little problem to the translator, since we can locate referents on the body without much difficulty. But they do show a different way of labelling these parts.

More problematic to interpret is ἴνες, a plural term that is perhaps related to the singular ἴς (‘strength’).⁷⁴ Bolens defines the plural ἴνες as referring to all active parts of human kinetics: the muscles, nerves, fibres, and the ligaments.⁷⁵ The semantic field is thus extended to strength and force. For example, it is used to describe the thick tendons of a bull’s neck (*Il.* 17.520-23):⁷⁶

ὡς δ’ ὅτ’ ἄν ὄξυν ἔχων πέλεκυν αἰζήϊος ἀνήρ
κόψας ἐξόπιθεν κεράων βοὸς ἀγραύλοιο
ἴνα τάμη διὰ πάσαν

As when a strong young man with a sharp axe in his hands strikes a field ox behind the horns and cuts through the whole sinew

The ἴς is further used by the hero Sthenolos to describe the immeasurable strength of men heading into battle (*Il.* 5.244-45):

ἄνδρ’ ὀρώω κρατερῶ ἐπὶ σοὶ μεμαῶτε μάχεσθαι
ἴν’ ἀπέλεθρον ἔχοντας·

74 ἴς (cf. Lat. *vis* ‘strength’). The connection, however, is tenuous. Beekes *s.v.* ἴς suggests that the connection is difficult, but allows that ἴς as ‘strength’ may have undergone a ‘remarkable concretization’ to change in meaning to ‘tendons.’ He also notes that ἴνες as ‘tendons’ might have been formed from an independent verb for ‘bow’ or ‘bend’ (see ἴτυς, ἰρίς). Chantraine (*s.v.* ἴς) has similar reservations. Clarke 1999: 112 also remarks on the rare (but not unique) declension of ἴς, ἰός, which provides further evidence that ἴς and ἴνες may in fact refer to two completely different words: the first referring to the abstract ‘strength,’ the second to anatomy. He nonetheless argues convincingly that both are derived from the same Proto Indo-European lexeme.

75 Bolens 2000: 27.

76 Hence ἰνίον, ‘nape of the neck’ or the muscles contained within it. The term appears twice in the *Iliad* in two metrical positions: 5.73 and 14.495. Both instances are in descriptions of blows to the back of the neck. A parallel example of this term-creation can be found in Egyptian body terminology. They possessed a word comparable to ἴς, the *ka*. As Gordon 2004: 79-86 has shown, the term was likely originally confined to the meaning of ‘life force’ or ‘animating force.’ The word was probably derived from observation of the muscle spasms of sacrificed bulls, animals that were believed to have extremely high concentrations of *ka*. Similar to the semantic change of ἴνες, the term was later used in a medical context to describe living, ‘fasciolating,’ muscle.

I see two powerful men coming at you in fury for the fight, men of huge strength. The ἴνες also bind together the flesh and the bone (*Od.* 11.219), and reside within the μέλεα (*Il.* 23.191). The term is clearly material, comparable to the τένοντες in the sense that it can be translated as ‘sinew.’ But unlike the τένοντες, the word also has the implicit active meaning of strength; it holds things together and is located within the limbs (μέλεα) in their capacity to provide power.

It is possible that the ἴνες are the muscle fascia or connective tissue, the ‘gristle’ when applied to animal meat (yet they never are within the poems). A person dressing an animal can tell that there are parts of the muscle-groups that are tough. Muscle-groups, especially after a traumatic death also often undergo post mortem spasm.⁷⁷ Therefore, both tensile and dynamic strength is observable in these parts. This model does not align well with our understanding of human physiology, since we are inclined to locate physical strength within the muscles, which are not described as functional parts within the Homeric poems. The ἴνες fills this gap by representing a union of material cause and effect that is difficult for us to conceptualize.

This Homeric system of amalgamating the upper layers, the skin and flesh of the body, into a single conceptual unit, the χρώς (which, as the visible surface, can also stand *pars pro toto* for the whole of the human body), is almost imperceptible in later Greek authors. Likewise, although terms for tendons survive semantically unchanged in later writings, the more abstracted terms that unify material with its activity in the poems, the γυῖα, μέλεα, and ἴνες, undergo significant alteration in meaning. Later, there is a general shift toward a further distinction between part and function.

77 See Madea 2013 for an analysis of this phenomenon.

2.5.2. The organs

Beneath the layers of skin and flesh of the torso lie the organs. Battle descriptions occasionally mention the major organs above the diaphragm, including the heart, and lungs; the liver and bladder are described as below the diaphragm. As in both medical and non-medical classical writings, the parts of the digestive system are not given specific labels in the epics. The liver and the intestines (or guts) are mentioned most frequently, since the soft abdomen is especially vulnerable to the sort of puncture injuries that occur on the battlefield. Few details are provided about the appearance or different parts of these organs. In all cases, though, the organs appear to be located accurately within the body, which shows an awareness of human internal anatomy, not just that of animals.

Although it is outside my discussion of anatomical parts in their physical sense, it is important to note that organs are mentioned in the poems far more frequently as the locations of emotional and intellectual activity. The poetic vocabulary of the *Iliad* and *Odyssey* preserved the notion that certain mental activity and emotions have their seat in the chest. Experience suggested that there was a link between our thoughts and body functions. Consider, for a prime example, Odysseus' well-known address at the beginning of *Odyssey* 20 (20.18-20; 22-24):

τέτλαθι δῆ, κραδίη· καὶ κύντερον ἄλλο ποτ' ἔτλης,
ἦματι τῶ, ὅτε μοι μένος ἄσχετος ἦσθιε Κύκλωψ
ἰφθίμους ἐτάρους·...
ὡς ἔφατ', ἐν στήθεσσι καταπτόμενος φίλον ἦτορ·
τῶ δὲ μάλ' ἐν πείσῃ κραδίη μένε τετληυῖα
νωλεμέως·

Bear up, my heart! A thing more hideous than this you once endured with patience, that day the Cyclops, unrestrained in fury, devoured your sturdy comrades...So he spoke, chiding the very spirit of his breast; and therefore in obedience his heart held firm and steadfast.

Modern scholarship has tended to group the heart (κρᾶδίη) along with the ἦτορ, πρᾶπίδες, and φρένες – terms that resist clear definition – under the collective heading of ‘psychological parts.’⁷⁸ Clarke has concluded that all of these words are probably used interchangeably in the Homeric poems.⁷⁹ Although this might be correct, it is probably fruitless to attempt to attribute a distinct translation for each term. To relate specific parts of the body to these terms requires that we suppose two things: that pre-classical Greeks imaged a one-to-one relationship between a physical part and its psychic function as we would be inclined to do; and that the Homeric poems accurately present this link between the physical and psychic self. There is insufficient internal evidence to suggest that either of these are true.

There is greater evidence for the physicality of other internal parts in the *Iliad* and the *Odyssey*. The organs tend to be generally grouped together into a lower class (the digestive organs below the diaphragm) and a higher class (everything above it). The generic term for the

78 See for examples de Romilly 1984: 43; Pelliccia 1995: 114-281; and Padel 1992: 18-19. Sullivan 1994 is one of the few exceptions where an attempt is made to distinguish between the different activities of the psychological organs. See further Sullivan 1988, esp. 21-70 (focusing specifically on the φρένες) and Sullivan 1995 (esp. 14-75). The term θύμος could be included in this list, although it has been convincingly argued elsewhere that the original meaning of the term was probably ‘breath’ (Casewell 1990: 7; ‘souffle’ Cheyns 1983: 30) or more specifically [but tentatively] ‘life-breath’/‘blood-breath,’ which is contrasted with the ψυχή, or ‘death-breath’ (Onians 1951: 30, 45-49).

79 Clarke 1999:63-5. The most thorough study of the psychological functions of the θύμος, φρένες, ἦτορ, κῆρ, κρᾶδίη, and πρᾶπίδες is Jahn 1987 (see esp. 182-94). His preliminary conclusion that there is significant semantic overlap of these terms is similar to Clarke’s (1987: 194): ‘Vor dem Eintritt in diese nächsten Arbeitsabschnitte ist jedoch festzuhalten, dass das Ergebnis der 1. Stufe der gezielten Untersuchung über die Austauschbarkeit der seelischgeistigen Instanzen die bisher gewonnenen Resultate offensichtlich absichert: Auch ein allgemeiner Überblick über das gegenseitige Verhältnis der Feldglieder des Wortfeld-Unterbezirks Seelisch-Geistige Verhältnis der Feldglieder samten Homertextes bietet keinerlei Ansatzpunkte für die Annahme semantisch bedingter Differenzierungen zwischen den einzelnen Lexemen.’ This multiplicity of terms for psychological organs is not unique to the Greek language. In Old English, for example, there existed at least eleven terms that can be translated as ‘heart’: *ferthloca*, *breostcofa*, *modsefa*, *hrether*, *breost*, *heorte*, *breosthord*, *ferhd*, and *hretherloca*. We can assume that such a semantic overlap is owing more to a simplification in our own modern language than a proliferation of synonyms for the ‘heart’ in Old English. Anderson 2003: 348, discussing these terms, posits a similar opinion; however, he draws a sharp distinction between what he calls ‘real parts’ (the *breost* and *heorte*) from the rest, or ‘imaginary parts,’ that have a tendency to appear only in poetic language.

higher organs is σπλάγχνα. Homer always uses it in the sense of the edible organs of animals.

A common scene is represented at *Iliad* 1.464-67:⁸⁰

αὐτὰρ ἐπεὶ κατὰ μῆρε κἀη καὶ σπλάγχνα πάσαντο,
μίστυλλον τ' ἄρα τᾶλλα καὶ ἄμφ' ὀβελοῖσιν ἔπειραν,
ὥπτησάν τε περιφραδέως, ἐρύσαντό τε πάντα.

Then when the thighs were burnt up and they had tasted the organs, they chopped the rest into pieces and threaded them onto spits, roasted them carefully, and then drew all the meat off.

Although Homer never describes the specific parts comprising the σπλάγχνα, it is probable that these include the five most salient organs in the chest cavity, those located above the intestines: the heart (κραδίη), the lungs (πνεύμων), the liver (ἥπαρ), the kidneys (νεφροί), and the spleen (σπλήν).⁸¹ In the case of humans, when the Homeric poems mentions these parts in wound descriptions they are carefully located within the body through reference to the body's surface.

κραδίη: heart

The epics mention the heart (κραδίη)⁸² frequently, but usually in the context of psychic activity. Only once is the κραδίη described as being wounded in battle, when Idomeneus kills Alkathoös with a blow to the centre chest (στήθος μέσον) in which the spear pierces his heart (δόρου δ' ἐν κραδίη ἐπεπήγει, *Il.* 13.438-42).⁸³ In most cases, the heart appears to be that which is excited and excites a character, the part within a person that responds to stimuli and signals its concern

80 See also *Il.* 2.426; *Od.* 3.9, 12.364. The earliest use of the word for a human part is in Hes. fr. 343.13 (West), in reference to Zeus hiding Athena in his *splanghna* (for 'insides?'). The next time it is used for human anatomy is in Pindar *Nemian* 1.35, which describes the birth of Heracles from Alcmena's *splanghna* (womb).

81 For a late description of the parts included in the term σπλάγχνα see Philo Judaeus (ca. 20 BCE – ca. 50 CE) *The Creation of the World* 118.5. See Berthiaume 1982: 46-48 and van Straten 1995: 131-32 for discussions of the later classical definition of the term, again referring to the heart, lungs, kidneys, liver, and spleen. It is possible that the Homeric use of the term, at variance to later authors, could also include the intestines and stomach (both authors rely primarily on Aristotle's comments at *HA* 524b). Both of these, however, require special treatment before cooking and eating (they must be scraped and washed to remove debris). Furthermore, the poems have the alternate term ἔντερα to describe these lower parts (although they do not contrast the σπλάγχνα with the ἔντερα, Aeschylus does at *Ag.* 1221 [ἐντέροις τε σπλάγχν]).

82 The poems have the variant καρδίη at the beginning of a line (e.g. *Il.* 2.452, 11.12, 14.152), which is the standard form in Ionic prose (Attic καρδία), e.g. *Hp. Cord.* 1.1, *Carn.* 6.2, *Hdt.* 3.35.

through palpitation. The part is described as being physically situated within the chest (στήθος) and φρένες.⁸⁴ In this location it feels (*Od.* 20.13) and can have sense (*Il.* 21.441); it makes its possessor aware of its own presence by becoming aroused. So before the slaying of the suitors (*Od.* 20.13):

κραδίη δέ οἱ ἔνδον ὑλάκτει.

The heart [of Odysseus] yelped inside.

and upon hearing of the death of Hector Andromache (*Il.* 22.460-61):

μεγάροιο διέσσυτο μαινάδι ἴση
παλλομένη κραδίην.

rushed out of the house like a woman in frenzy, her heart jumping.

From a modern perspective, it is somewhat odd that the heart (κραδίη) is struck only once in all the battle descriptions in the epics. It is clear, though, that it has a material presence both as a psychological part and as a part that can be wounded. A likely possibility is that the oral tradition placed a much greater emphasis on the emotional and intellectual function of the organ. Alkathoös' pierced heart therefore distinguishes the hero from any other through his unique death.

ἥπαρ: liver

Homer mentions the liver 9 times in the epics in 4 different metrical positions. Two of these describe the eating of a hero's liver: Priam describes himself metaphorically eating Achilles' liver in anger (*Il.* 24.212); and Tytios' is eaten by two vultures in the underworld (*Od.* 11.578).

The other seven appearances of ἥπαρ are in descriptions of wound-sites. In these instances, the

83 The scene has attracted scholarly attention because of its suspect physiological probability, since the spear begins to twitch with the beating of the heart. The possibility of this remains open to the medical community (Saunders 1999: 348-49, Apostolakis 2010: 1); however, the event still can appear miraculous (Fredrich 2003: 14, Holmes 2007: 47 n.1).

84 *Od.* 20.13: στήθος δὲ πλήξας κραδίην ἠνίπαπε μύθω: 'But [Odysseus] smote upon his breast and..reproved his heart.' *Il.* 16.435: διχθὰ δέ μοι κραδίη μέμονε φρεσὶν ὀρμαίνοντι 'When I think on it, my heart pulls two ways [in my φρένες]' (see also 10.10, although the authorship of this book is now seriously questioned).

inner organ is carefully located within the body by descriptions of its relation to other parts. In one formula the liver is described as being below the *πραπίδες* (*diaphragm*).⁸⁵ In another scene the liver is mentioned twice: once to describe the point of impact and again illustrating the result of the blow.⁸⁶ The two descriptions of liver injuries in the *Odyssey* are especially detailed in their placement of the organ within the exterior body (22.81-83):

ὁ δ' ἄμαρτῆ διος Ὀδυσσεύς
ἰὸν ἀποπροΐει, βάλε δὲ στήθος παρὰ μαζόν,
ἐν δέ οἱ ἥπατι πῆξε θοὸν βέλος.

But on the instant royal Odysseus shot an arrow and hit [Eurymachus] in the breast beside the nipple,⁸⁷ fixing the swift bolt in his liver.

and in an example explicitly showing how a hero places his strike (9.299-302):

τὸν μὲν ἐγὼ βούλευσα κατὰ μεγαλήτορα θυμὸν
ἄσσον ἰών, ξίφος ὄξυ ἔρυσσάμενος παρὰ μηροῦ,
οὐτάμεναι πρὸς στήθος, ὅθι φρένες ἥπαρ ἔχουσι,
χείρ' ἐπιμασσάμενος·

And then I [Odysseus] formed the plan within my daring heart of closing on [Polyphemus], drawing my sword from my thigh, and stabbing him in the breast where the midriff holds the liver, feeling the place with my hand.

πνεύμονες: lungs

The lungs as *πνεύμονες* are *hapax* in the epics at *Iliad* 4.527-28:

Τὸν δὲ Θόας Αἰτωλὸς ἀπεσσύμενον βάλε δουρὶ
στέρνων ὑπὲρ μαζοῖο, πάγη δ' ἐν πνεύμονι χαλκός·

As Peiros ran back, Thoas the Aitolian caught him with his spear in the chest above the nipple, and the bronze fixed in his lung.

85 *Il.* 11.579, 13.412, and 17.349: ἥπαρ ὑπὸ πραπίδων, εἶθαρ δ' ὑπὸ γούνατ' ἔλυσεν '[X was struck upon] the liver beneath the diaphragm and instantly collapsed his strength.'

86 *Il.* 20.469-70: ὁ δὲ φασγάνῳ οὐτα καθ' ἥπαρ· ἐκ δέ οἱ ἥπαρ ὄλισθεν 'Achilles stabbed [Tros] in the liver with his sword: his liver slid out.'

87 For the spatial relation between an adult liver and the nipple, see Usselman 1966: 765: 'the inferior margin of the left lobe of the liver...normally lies at or just below the nipple line [when the body is reclined].' The liver might descend a nominal amount in the standing position, but only a few millimetres (Harauz and Bronskill 1979: 734).

There is, however, some reason to believe that elsewhere in the epics the term φρένες is used for the lungs. Onians specifically points to an example where the φρένες are pulled out of the body when extracting a spear (*Il.* 16.503), which he argues could not be the case if the φρένες here meant the diaphragm. He also believes that when Odysseus was planning to stab Polyphemus ‘where φρένες the hold the liver’ (*Od.* 9.301, quoted above), the poet meant the lungs; however, Onians admits that this description would satisfy a reading of either the diaphragm or the lungs. His further evidence is based on the Homeric term μετόφρενον:⁸⁸ “‘the part behind the φρένες,’” a strange name to use at all for a large area if the φρένες meant merely the membrane dividing the thorax from the abdomen.⁸⁹ This interpretation is probably correct, since it explains both the common plural form of the word and the single appearance of πλεύμων (*lung*) in the poems.⁹⁰

σπλήν: spleen; and νεφροί: kidneys

The spleen and kidneys are never explicitly mentioned, but there is some evidence in the Homeric poems that they were recognized. The terms σπλάγχνα and σπλήν are probably based on the same root.⁹¹ If this is so, it is possible that the spleen was included and recognized as being among the organs that were roasted and eaten after a sacrifice (σπλάγχνα). The adjective ἐπινεφρίδιος (‘upon the kidney’) also appears once at *Iliad* 21.204 in a particularly gory passage describing Achilles’ killing of Asteropaios (*Il.* 21.108-204):

⁸⁸ E.g. *Il.* 2.265, 16.806, 22.283.

⁸⁹ Onians 1951: 27-28. He also cites Aeschylus as supporting evidence, who describes the φρήν enclosing the heart (καρδία) at *Ch.* 832, as well as the heart ‘kicking the φρήν in fear’ at *Pr.* 881, and it ‘whirling in eddies against the φρένες’ at *Ag.* 996. Lloyd 1983: 152 agrees with this interpretation. Garland 1981: 48 equates the φρένες with the lungs without discussion. The chief evidence for this assumption comes from two passages: the φρένες are described as both holding the liver (*Od.* 9.301) and as being able to be pulled out of the chest cavity along with a spear point (*Il.* 16.481-504). For a discussion of the full possible semantic range of φρένες, including its potential meaning as either the pericardium or the diaphragm, see Ireland and Steel 1975.

⁹⁰ The singular φρήν appears only once in the epics at *Il.* 10.44, although book 10 is now generally believed to be a later addition.

⁹¹ Individually reconstructed as *σπληχ- and *σπλαχ-. Wharton (*s.v.* σπλάγχνον) and Hofmann (*s.v.* σπλήν) both quietly accept this connection; Chantraine *s.v.* σπλήν (2) also agrees. Frisk (*s.v.* σπλήν), however, is more cautious: ‘Da eine Rekonstruktion im einzelnen nicht möglich ist, müssen wir uns auch für σπλήν und das davon nicht zu trennende σπλάγχνον auf blosse Vermutungen beschränken.’ The earliest reliable source that we have for the term σπλήν is Herodotus (2.47).

γαστέρα γάρ μιν τύψε παρ' ὀμφαλόν, ἐκ δ' ἄρα πᾶσαι
 χύντο χαμαὶ χολάδες· τὸν δὲ σκότος ὅσσε κάλυψεν
 ἀσθμαίνοντ'...
 ...τὸν δὲ κατ' αὐτόθι λείπεν, ἐπεὶ φίλον ἦτορ ἀπηύρα,
 κείμενον ἐν ψαμάθοισι, δίαινε δέ μιν μέλαν ὕδωρ.
 τὸν μὲν ἄρ' ἐγγέλυές τε καὶ ἰχθύες ἀμφεπένοντο
δημόν ἐρεπτόμενοι ἐπινεφρίδιον κείροντες·

[Achilles] struck him in the belly near the navel: and all his guts gushed on the ground, and darkness covered over his eyes as he gasped in death...[N]ow that he had taken the life from him he left the man there, lying where he was on the sand, with the dark water lapping him. And eels and fish were his busy attendants, tearing and nibbling at the fat around his kidneys.

This δημὸς ἐπινεφρίδιος, or 'kidney-surrounding fat,' is known in the modern medical nomenclature as the paranephric body. The fat deposit is common to most large mammals, a fact which must have been recognized through butchery at an early time. Aristotle calls it περίνεφρος στεατώδης, or 'tallow-like fat around the kidney,' and adds that it is especially plentiful in sheep (*HA* 520a). Its sole appearance here within the Homeric epics is a particularly good example of the flexibility that the poet had within the oral formulaic system to innovate through the inclusion of apparently non-formulaic vocabulary.

κύστις: bladder; ἔντερα and χολάδες: intestines

The intestines, or more generally the lower organs, are usually not differentiated in the poems. With the exception of the sole formula mentioning the bladder (κύστις),⁹² when the poems describes these lower parts the terms ἔντερα and χολάδες are invariably used. These terms appear to be semantic equivalents of each other.⁹³ The bladder is descriptively located in relation to the right buttock (γλουτὸν κατὰ δεξιόν); in the scene a hero's arrow passes through this

92 *Il.* 5.67, 13.652. This distinction of the κύστις is probably due to its clear purpose and spacial definition. The bladder is one of the few spatially isolatable organs within the abdominal cavity, being located below the digestive system. The fluid held within the organ, urine, would also have been clearly identifiable (unlike the mixture of bile and digesting food within the intestines). We can also include the stomach here as well. The γαστήρ appears to be used in the *Odyssey* to refer to animal stomachs used as containers (*Od.* 18.44, 118, 20.25). These would be filled with blood and fat, and then cooked in a fire. At 18.84 the γαστήρ is explicitly from a goat.

flesh, into the bladder, and below the (hip?) bone (ὑπ' ὀστέον).⁹⁴ The words ἔντερα and χόλαδες, but again with one exception, are used exclusively for the human body. χόλαδες appear only twice in the *Iliad* in a recurring scene describing the disembowelment of a hero by a spear-wound beside the navel (παρ' ὀμφαλόν).⁹⁵ The term ἔντερα is more common, showing up six times in three metrical positions.⁹⁶ Five of them describe a wound to a hero's abdomen.⁹⁷ In each instance the location of the blow is made explicit to the audience, being placed somewhere in the soft area between the ribs and the hips. At *Iliad* 20.418 we once again see the wound beside the navel (παρ' ὀμφαλόν); at 13.507 and 17.314 it is the middle of the paunch (μέσση γαστήρ); and at 14.517 the wound is to the lumbar region (λαπάρα). These two examples suggest an interest in the lower organs within the poems, a consistency with describing their location, and the possible semantic overlap between the χόλαδες and the ἔντερα.⁹⁸

2.6. Conclusions: Homeric mapping of the body

The Homeric poems describe the relations of these parts in a sophisticated way that suggests an understanding of human anatomy (probably through exposure to injuries).⁹⁹ While sometimes vague (due to 'fuzzy' boundaries of some parts), descriptions usually do not leave internal parts

93 The *hapax* term ἔνδινα (*Il.* 23.806), although perhaps meaning 'guts,' is likely more general: 'the things beneath the armour,' or 'viscera.' Its appearance in this passage, referring to the human body, is perhaps a distinction between human insides and animal σπλάγχνα. There appears to be a similar meaning for the term ἔγκατα. This word appears five times within the epics in three metrical positions. The first four instances are in lion similes describing the beast as consuming the innards of an ox (*Il.* 11.176, 17.64, 18.583; *Od.* 9.293). The last reference refers to the innards of the oxen of Helios being roasted by Odysseus' crew (*Od.* 12.363). The higher organs, not the intestines, would have been roasted on a spit (Durand 1989: 100).

94 Saunders 1999: 352-53 traces the trajectory of the arrow through the symphysis pubis (the joint that connects the left and right pubic bones) and bladder, and out below the pubic arch. He argues that the description does not require any specific knowledge of the construction of the hip or pubic bones, since such a wound would be externally visible. However, it is important to add that the relative location of the bladder is accurate, and must have been known.

95 *Il.* 4.526, 21.181.

96 *Il.* 13.507, 17.314, *Od.* 21.408; *Il.* 14.517, 20.418; *Il.* 20.420.

97 *Il.* 13.507, 14.517, 17.314, 17.418, 20. The sixth appearance of the term, *Od.* 21.408, is both the only time it is used in the *Odyssey* and in the singular (ἔντερον). The passage describes the twisted gut of a pig used to make a phorminx string.

98 This is indicative of a persistent disregard for or ignorance about the lower organs in ancient Greek thought, especially in non-technical works. See chapter 6 for a focused discussion, which describes anatomical language in Comedy.

floating around in some vaguely defined internal space, but locate them by referring to points on the body's surface. What the poems relate, then, is that parts have fixed places within the human body – any human body – and that superficial features can be used to tell us where they are.

This is evidence of an awareness of a generalized model of the body: despite superficial differences, the organization of internal organs is consistent. As a narrative device in the poems, this method of description is an aid to the audience to imagine vividly the detailed action on the battlefield.¹⁰⁰ It is impossible to say for certain whether the audience had a similar understanding. Perhaps they did, but the accounts of what lies beneath our surface might even have had greater impact if they did not; the poems could have exposed thrilling pictures of things that should remain hidden inside of their bodies.

The descriptions do suggest an awareness within the oral poetic tradition of the relative position of parts within the human body, not just within animals. This points to at least some exposure to human internal anatomy. One source for this knowledge was probably the battlefield. It is part of the successful soldier's stock of knowledge to know which places on the human body are the most effective to kill his opponent. This requires a primary understanding of where on the body's surface to strike (*Il.* 8.324-26):

τὸν δ' αὖ κορυθαίολος Ἴκτωρ
αὐερύοντα παρ' ὤμων, ὅθι κληῖς ἀποέργει
αὐχένα τε στήθος τε, μάλιστα δὲ καίριόν ἐστι¹⁰¹

Hector of the glinting helm struck [Teukros] with the jagged stone, hitting where the collar-bone separates the neck and chest, an especially dangerous spot.

Hector will in turn fall to Achilles' equally successful blow (*Il.* 22.324-25):

99 It seems unlikely that all Homeric oral poets would have had the same opportunities to observe the human body in such a situation. It is more probable that most detailed anatomical descriptions were part of the formulaic tradition that were learned as part of a poet's education. As I have suggested earlier, terms that appear only once across the poems perhaps illustrate that a particular poet innovated upon these formulae and was drawing upon his own familiarity with the parts that he describes.

100 Other information of human internal anatomy could of course be gained from external observation, such as the palpitation of the heart and the movement of the chest through respiration.

101 For a similar evaluation of a strike to a horse's brain pan (κρανίου) see *Il.* 8.84.

φαίνεται δ' ἢ κληῖδες ἀπ' ὤμων ἀχέν' ἔχουσι
λαυκανίην, ἵνα τε ψυχῆς ὠκιστος ὄλεθρος·

[an opening] showed above where the collar-bones hold the neck and shoulders, at the gullet, where a man's life is most quickly destroyed.

Sometimes the prognosis of the injury is mentioned, if it is not immediately fatal (*Il.* 13.567-69):

Μηριόνης δ' ἀπιόντα μετασπόμενος βάλε δουρὶ
αἰδοίων τε μεσηγὺ καὶ ὀμφαλοῦ, ἔνθα μάλιστα
γίγνεται ἄρης ἀλεγεινὸς οἰζυροῖσι βροτοῖσιν.¹⁰²

But Meriones caught [Adamas] as he went back and struck him with a spear between the genitals and the navel, the place where death in war comes most painfully to suffering mortals.

The added details – ‘an especially dangerous spot’; ‘where a man's life is most quickly destroyed’; and ‘the place where death...comes most painfully’ – identifies the poet as someone with an intimate knowledge of combat and the body's surface, at least to the audience.

The Homeric poems show a high level of visualization about what lies beneath the surface. In most cases they provide the audience with what can be called an exploded model or X-ray picture of the human body, with bones, flesh, tendons and muscles visually hidden but verbally mapped beneath the skin.¹⁰³ Consider again Odysseus' plan for the Cyclops (*Od.* 9.300-3):

ξίφος ὄξυ ἐρυσσάμενος παρὰ μηροῦ,
οὐτάμεναι πρὸς στήθος, ὅθι φρένες ἦπαρ ἔχουσι,
χείρ' ἐπιμασσάμενος·

drawing my sharp sword from my thigh, and stabbing him in the breast where the midriff [lungs?] holds the liver, feeling the place with my hand.

102 As a modern point of comparison, the mortality rate of abdominal injuries in the American Civil War was nearly 100% (Rozin 1987: 658). This statistic must be considered slightly anachronistic, though, since many of these would have been gunshot wounds that create far more trauma than stabbings.

103 Although the poems provide us with our early evidence of this sort of conceptualization in Greek thought – that which allows one to imagine the interior material of a body – there is evidence of this in earlier Babylonian thought. For example we have detailed Babylonian representations of the liver used for divination (see Geller 2010: 38-44; on the exchange of medical knowledge between Babylonian and archaic Greece see Thomas 2004).

Odysseus' motivation illustrates that he believes that there is something – in this case the liver – that is beneath the skin. When it is damaged, the result is death. He also believes that the organ can be found by exterior signs. We are not told what these are; however, we can imagine Odysseus feeling for the bottom terminus of the sternum.¹⁰⁴ A wound just below this would both avoid interference from the rib cage and possibly puncture the liver.¹⁰⁵

What is important here is that the Homeric heroes are depicted as seeing an enemy's body in a way that divides the body into sections in order to make a successful kill. The upper torso (στέρνον/σπηθος) is separated from the genital region (αἰδοῖα)¹⁰⁶ through the mediation of the belly or paunch (γαστήρ).¹⁰⁷ The upper torso is descriptively limited by the collarbone (κλήϊς, *Il.* 8.326) and the lowest clear limits are at the bottom of the sternum, the waist, or the groin.¹⁰⁸ Sometimes 'the chest' is the most exacting location we get for a wound.¹⁰⁹ Elsewhere, the nipple (μαζός) becomes the reference-point for describing the impact.¹¹⁰ The belly (γαστήρ) is similarly divided. When an injury to this area is mentioned, its location is in its middle (μέση

104 I.e. the xiphoid process. In later medical terminology this would be called the *χονδρίον*. See section 3.3.1 below for discussion of this body part.

105 McGowan 1935 for example discusses several modern instances of stab wounds to this area that have punctured the liver.

106 The term *μήδεα*, which appears only in the *Odyssey*, seems to mean more specifically the external male genital parts, since they can be severed from the body (*Od.* 18.87, 22.476).

107 The term *γαστήρ* in the *Iliad* can always be interpreted as referring to the exterior body. In one instance at 6.58 it might refer to the womb (*γαστέρι μήτηρ*), but the exterior body might still be meant (see section 6.3.2 below for *ἦτρον* in Aristophanes as the externally visible distension of the womb). *γαστήρ* in the *Odyssey* seems to be used for the stomach as well as for the belly, e.g. 17.228, 18.364 (feeding the *γαστήρ*); 4.369 (hunger in the *γαστήρ*); 18.2 (greed of the *γαστήρ*); 20.25 (a roasted ox *γαστήρ*). The term *νήδυσ* appears to be closely related in meaning with the *γαστήρ*. It is contrasted with the *στέρνον* (*Il.* 13.290), and when the is struck the *νήδυσ* (entrails) can fall out (*Il.* 17.524).

108 The lowest point described for the *σπηθος* is at *Od.* 9.301 where Odysseus feels for the place where the *φρένες* hold the liver, while the terminus of the *στέρνον* is more loosely contrasted with the waist (*ζώνη*: *Il.* 2.479) and groin (*νήδυσ*: *Il.* 13.290). Although the poverty of evidence makes it difficult to prove, it is possible that *στέρνον* had a larger referential range than *σπηθος*. The difficulty of locating a terminus point does not occur at the upper end, since the collar-bone provides a far more prominent feature for division than there is for the bottom extent of the body-part. Here at the bottom we see a fuzzy focus meaning that the range of the higher and lower divisions is not fixed.

109 E.g. *Il.* 11.108, 144. This description is refined by reference to the 'centre of the chest' (*σπηθος μέσον*: *Il.* 15.523, 16.597).

γαστήρ),¹¹¹ at its bottom (νεΐαιρη γαστήρ),¹¹² or described as being beside the navel (παρ' ὀμφαλόν).¹¹³ The genital region is mentioned only once in the *Iliad* in a description of a blow between it and the navel.¹¹⁴ Further areas of impact are the flank (λαπάρη),¹¹⁵ the hip-joint (ἰσχίον),¹¹⁶ and the back (νῶτον, μετάφρενον).¹¹⁷ Descriptions are often augmented by locating the strike to either the right (δεξιός)¹¹⁸ or left (ἀριστερός)¹¹⁹ side of the body.

This summary of the divisions of the torso suggests a way of conceptualizing the body that is comparable to that of modern medicine given in *Gray's Anatomy* (Fig. 2.1). Homer's divisions (Fig. 2.2) are not so refined as this, although there are close similarities. In particular, the way of breaking up the surface of the body is the same for each. There is a dorsal line running along the sternum that divides the body into right and left halves; the torso is distinguished from the belly (gastric region) and the abdomen (hypogastric region); and specific superficial features, the nipples, the navel, the collar-bones, and the hip-bones are used as points of reference.

110 The blow the chest is either above the nipple (at the end of a line, παρὰ μασθόν: *Il.* 4.480, 8.121, etc.) or beside it (first and second feet of a line, ὑπὲρ μασθόιο: *Il.* 11.108). The only blow to the στέρνον where the nipple is the reference-point is at *Il.* 4.528. The term μασθόν (*nipple*) is used only four times for females at *Il.* 22.80, 24.58 and *Od.* 11.448, 19.483. Other than a possible fragment from the 6 / 5th century BCE philosopher Epimenides where the term refers to the nipple of Zeus (fr. 21 DK), the next clear reference is from Herodotus. He uses the term exclusively for the women's breasts (2.85, 4.202, 9.112). The term is Ionic, and appears in Attic writings only in a quotation of Homer in Aristotle (δεξιτερόν κατὰ μασθόν, *Po.* 1458a7).

111 *Il.* 13.506, 17.313.

112 *Il.* 5.539, 16.465.

113 *Il.* 21.180.

114 *Il.* 13.568: αἰδοίων τε μεσηγὺ καὶ ὀμφαλοῦ.

115 A hero is alternatively hit against his flank (κατὰ λαπάρη: *Il.* 6.64, 14.447) or alongside it (παραὶ λαπάρη: *Il.* 3.359, 7.253). Once, a spear travels straight through (*Il.* 16.318).

116 *Il.* 5.301, 11.339.

117 E.g. νῶτον: *Il.* 17.463; μετάφρενον: *Il.* 2.265, 12.428.

118 E.g. injury to the right shoulder (*Il.* 5.46, 11.507: κατὰ δεξιὸν ὦμον), the right buttock (*Il.* 13.651: γλουτὸν κάτα δεξιόν), and the right nipple (*Il.* 5.393: δεξιτερόν κατὰ μασθόν).

119 E.g. a spear-throw above the left shoulder (*Il.* 5.16: ὑπὲρ ὦμον ἀριστερόν) and a strike to the left nipple (*Il.* 11.321: κατὰ μασθόν ἀριστερόν).

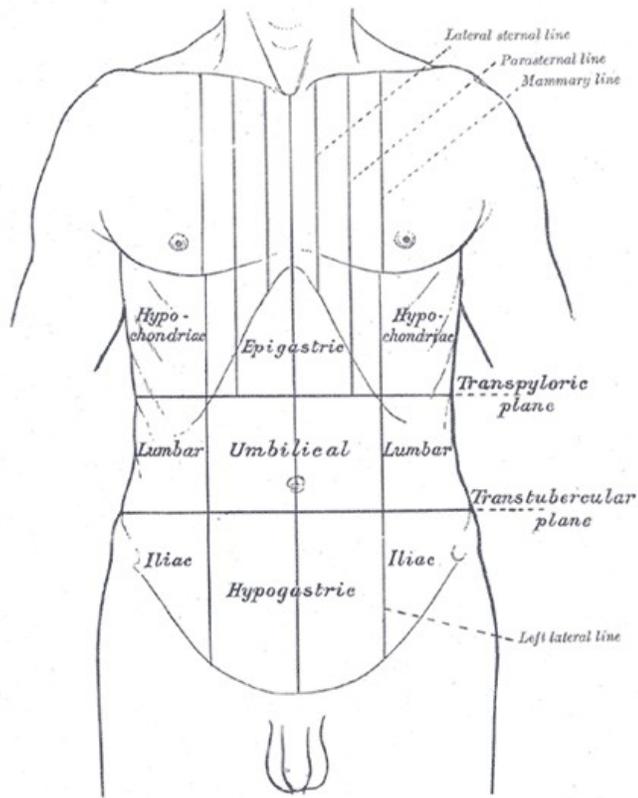


Fig. 2.1: Modern medical division of the body
(Gray's Anatomy 1918, fig. 1220)

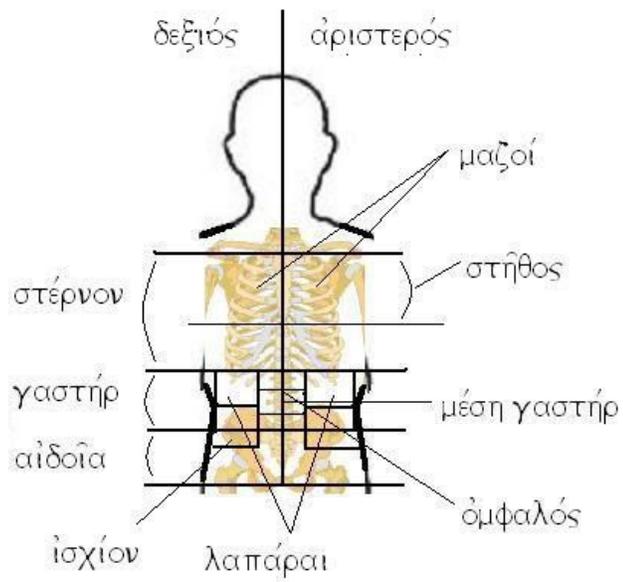


Fig. 2.2: Homeric division of the body

The vocabulary for dividing the exterior body in the Homeric poems is very similar to that in the Hippocratic Corpus, with the exception of some further refinement of details. This similarity is not incidental. Both the oral formulaic tradition and later medical writers had the intended goal of communicating to an audience in an accurate way what part of the body is meant. Although anatomical language in later medical writings is intended to provide a model of the body for healing, the Homeric poems shows how it is destroyed. The body has parts below this level that, since they are so fragile, must remain protected and healthy for life to be preserved. The most efficient way to end a hero's life on the battlefield is of course to disrupt this balance. These poems provide a window to human fragility by illustrating exactly how a hero brings about (and perhaps mentally anticipates and plans for) the death of his opponent.

The Homeric epics set a benchmark for anatomical language that is rarely matched in later Greek writings, and leave the impression of the body as a highly segmented thing. With a few exceptions, such as terms that are associated with strength and movement (γυῖα, μέλεα, ἴνες, τένοντες), specific parts of the body are usually congruent with our own modern understanding of them. Bones and organs are described in mature ways that suggest a good knowledge of the contents and their locations within the body. Furthermore, the poems show a detailed way of explaining the locations of these parts by using features on the surface of the body as reference points. The lack of literary evidence contemporary with these poems makes it difficult to conclude anything certain about general anatomical knowledge in the Dark Age and early Archaic periods; however, the audience listening to these poems were confronted with many detailed verbal images of the body, and at the very least they were invited to rise to the challenge of picturing these descriptions. The battle injuries must have offered an exceptional model of the body to the audience; things meant to remain hidden were exposed to them for their entertainment and instruction.

Several Homeric terms problematize what the body is. There are words that are difficult for us to comprehend and to translate, such as δέμας, χρώς, γυῖα, and μέλεα, but their strangeness to us does not mean that the Homeric tradition did not represent the human body in a way that was both meaningful and true to them. Moreover, the epic language also suggests a clear distinction between living human bodies and those of dead (and especially edible) animal bodies. Some terms, for example σπλάγχνα, are only used for animals; others, such as σόρξ and κρέας (flesh), are only used for animals or for dead humans (this will change in the Hippocratic writing). When these terms are applied to humans, the effect seems to be a debasement of a hero's body to the level of a material thing. The use of these terms is evidence that how we talk about the human body is a cultural construction. Language cannot be used to assemble an image of a 'natural' body, that is one that persists unchanged through time. Rather, it reflects the way that a particular group has chosen to look at the body and to describe it to suit its needs.

The Homeric depiction of the body, as with other elements of the epics, remained something that later authors regularly engaged with. But for all its detail, the Homeric model of the body is not complete. For example, although the major organs are mentioned and located accurately within the body, their appearance is not described. Thus there is no evidence in the poems to suggest that they were examined in detail as they were by later Hippocratic writers (e.g. the lobe of the liver or the valves of the heart). Furthermore, the poems show little interest either in how these parts are connected to one another or in the various other structures within the body (e.g. channels, membranes, and tissues). The conclusion from this is that the Homeric poems show no evidence of investigation into how the body works, only how life is ended

(through damage to internal parts). We must wait until the medical writings contained in the Hippocratic Corpus to see any specific advancement in this area.

Chapter 3

The Body in the Hippocratic Corpus

Φύσις δὲ τοῦ σώματος, ἀρχὴ τοῦ ἐν ἰητρικῇ λόγου·

The nature of the body is the beginning of the study of medicine.

Hippocratic *Places in Humans* 1

The detailed Greek anatomical vocabulary represented in the *Iliad* and *Odyssey* was significantly expanded in the Hippocratic Corpus, a collection of medical writings mostly dating to the 5th and 4th centuries BCE. (The treatises generally considered to have been written during this time frame are hereafter referred to as ‘HC’.)¹ The reason for this increase from earlier periods (and in other contemporary writings) was classical Greek medicine’s concentrated investigation of the body in the contexts of health and sickness. This privileged body parts that were either unimportant or not yet recognized while the Homeric poems were being composed. In these medical writings, the body and its parts are brought to the forefront to an unparalleled degree.

Although the treatises in the corpus were collected under the name of the renowned physician Hippocrates of Cos (*ca.* 460 - *ca.* 370 BCE), they were written by various and generally anonymous authors.² They were later gathered – likely during the Hellenistic period – into a collection similar to today’s.³ The treatises cover a broad range of topics connected with medicine, including technical works on clinical care, theoretical writings about disease and the

1 The identification of the date and of the origin of individual works within the HC is very problematic. As Jouanna 1999: 57 remarks: ‘Diverse in origin, the Hippocratic treatises are also diverse with respect to date of composition. Most of them, to be sure, are contemporaneous with Hippocrates [c. 460-370 BCE]; but some date from the time of Aristotle, or even later.’ I follow Jouanna’s dates for all works (Jouanna 1999: 373-416). See further Nutton 2004: 60, who gives 420-350 BCE as a comfortable range for a large number of Hippocratic treatises (Lloyd 2003: 41 offers a similar range of 450-350 BCE). See ‘List of Abbreviations’ above for relevant treatises and their proposed dates. My approach in this project does not require fixed or relative dates for individual works, but rather the identification of those that either were likely written before Aristotle or contain pre-Aristotelian material (see Lloyd 1966: 10 for this methodology).

body, and those intended for a general audience.⁴ But despite these various and sometimes contradicting approaches to health, medicine, and the body,⁵ there were dimensions of classical medicine that allowed someone to speak in broad terms of a τέχνη ἰατρική ('medical art').⁶ Hippocratic writers self-identified with belonging to this special field, which is a necessary condition if we are to speak of a technical language.⁷

The HC is particularly important to the study of technical vocabulary because it contains some of the earliest examples of Greek prose and, more specifically, technical writing about a specific craft (τέχνη).⁸ One important benefit that classical physicians gained from this new form of writing was the ability to record their theories, observations, and conclusions in ways that poetry would not have easily allowed. For example, medical writers could produce lists and

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- 2 The identification of authorship of any writing within the HC is outside the scope of this chapter. For a good discussion of the problem of assigning individual works within the corpus to any author, or the so-called 'Hippocratic question,' see Lloyd 1975a. Although I use masculine pronouns when referring to these anonymous Hippocratic authors, evidence for female physicians in classical Greece leaves the possibility that a Hippocratic treatise could have been written by a woman. For discussions of female physicians in the Classical period, see Pomeroy 1977: 51 and 1978, and Flemming 2007.
 - 3 When these texts were assembled is a problematic question, although it is likely that they originated as a library collection (some perhaps from the medical school of Cos, the home of the historical Hippocrates, according to ancient biographers), which eventually came into the hands of Alexandrian compilers (Jones 1923a: xxix-xx; Nutton 2004: 61; Jouanna 1999: 62-63).
 - 4 On the diversity of the Hippocratic writings, see Jouanna 1999: 56-71 and Nutton 2004: 60-62. See 'List of Abbreviations' above for a classification of individual works, which follows Jouanna 1999.
 - 5 For example, scholarship has presumed an intellectual conflict between Coan and Cnidian medical schools. The Coan school, to which the historical Hippocrates is believed to be attached, might have been chiefly concerned with prognosis of an illness. The Cnidian school, on the other hand, might have been more interested in diagnosis. Langholf 1990: 13-36, while providing an excellent summary of the extant elements of Cnidian and Coan medical approaches in the HC, reminds us that it is both difficult and at times impossible to identify a specific school of thought in any single Hippocratic writing. Lonie 1978 goes so far as to argue the very notion of a Cnidian school of medicine is due more to historiographical inertia than any historical fact.
 - 6 For a specific discussion of the medical art within the HC, see *de Arte*, a work dedicated to justifying the existence of the τέχνη ἰατρική. See Phillips 1973:39-40, Nutton 2004: 63, and Mann 2012: 1-7 for discussions of this work and its relation to the 'art' of medicine. For similar definitions of the medical τέχνη, see *VM* 1 (Schiefsky 2005a *ad loc.* for discussion) and *Jusj.* (Jouanna 1999: 128-31 and Nutton 2004: 66-68). A partial definition of τέχνη is given by Plato (*Grg.* 465a). He argues that it is founded on rational principles; it seeks to understand the nature (φύσις) of the object of investigation, and thereby it is able to provide a reason (αἰτία) for every action involved in the practice of a craft. For him the medical profession fulfils the requirements of a τέχνη. Plato considers ὀψοποιία (cookery) to be a foil to the medical art, which has knowledge (ἐπιστήμη) but lacks rationality (λόγος).
 - 7 This self-identification is further evident in authors' shared use of the technical dialect of the time, Ionic (although not a pure form), despite the fact that many treatises were likely written outside of Ionia. On the Ionic dialect in the HC, see Bers 2010: 456-57, Nutton 2004: 44-45, and Jones 1923a: lxii-lxiii.
 - 8 For discussions, see Lonie 1983, Miller 1990, Goldhill 2002: 104-10, and Dean-Jones 2003.

organize ideas without having to be concerned with poetic structure or vocabulary.⁹ Any other medical writer who wished to respond or add to a treatise could do so more easily for the same reasons.¹⁰ As Dean-Jones has commented, the production of medical texts allowed doctors ‘to keep lists of symptoms and syndromes that could ever be added to, refined, and subdivided.’¹¹ A byproduct of these texts on disease and treatment were verbal descriptions of a body that could also be augmented and subdivided to a very large extent.

Because of an interest in the medical body, the HC shows the first strong Greek scientific impulses toward discovering ὅ τί ἐστὶν ἄνθρωπος, ‘what sort of a thing is a human’ (*VM* 20). One of the medical writers’ approaches to answering the question was to investigate the many interconnected (and often obscure) parts that made the body work. Their texts in turn offered complex verbal models of the body, a collection of words, that functionally transmitted anatomical knowledge, yet in doing so they reduced the body to something strictly material. As Gundert has illustrated, there was little room in the Hippocratic treatises either for the soul (ψυχή) or for other non-material ‘psychic’ parts that we have seen in the Homeric poems.¹² These were not the living animated bodies of the physician, patient, or reader. Rather, the body represented in these early medical texts was an artificial model of a material thing, and thereby confused boundaries of classification, including those between living and dead and between human and animal.

9 See Lonie 1983 for the claim that prose writing provided Hippocratic authors with the opportunity for greater innovation and experimentation. See Lloyd 1987: 70-78 for further discussion of the intellectual avenues opened by Greek literacy. Finkelberg 2007, however, correctly remarks that the distinction between poetry and prose as written compositions was less clear in the ancient world than it is now. Indeed, as I discuss in chapter 5, technical prose vocabulary was a rich source for Classical poets to mine.

10 See Craik 2006a for a full discussion of the different types of intertextuality between Hippocratic writings, including conceptual exchanges, and the production of digests and aphorisms gathered from longer treatises.

11 Dean-Jones 2003: 99.

12 Gundert 2000.

This chapter illustrates how Hippocratic authors were reconstructing the human body through the use of new vocabulary, which would become a model that contemporary non-medical writers could engage with, emulate, and parody. I specifically focus on answering how Hippocratic authors attained their new anatomical information, how they labelled new parts, and whether these terms could be considered technical. In brief, my argument is as follows:

- 1) Hippocratic writings show a verbal model of the body that is more nuanced than that in the Homeric poems, due to new medical theories about how the interior body worked and how to treat it.
- 2) These writers used new sources for their anatomical knowledge of humans. Because of taboos against the dissection of human bodies, they resorted to chance observations of human injuries and of corpses – likely a source for Homeric descriptions, although from a different, medical, perspective – but they also used comparative anatomy of animals to help construct a fuller picture of their medical body.
- 3) This new model of the body required Hippocratic authors to use a specialized vocabulary to relate the parts they were seeing. Term creation is highest in the areas of (1) divisions of the superficial body; (2) internal structures that they believed contained fluids; and (3) parts that conveyed fluids between these structures.
- 4) Evidence from medical writings suggest that physicians were aware that they were using a special anatomical vocabulary. I focus especially on appearances of the qualifier *καλεῖν* (*so-called*) that regularly accompanied these terms, which shows that they made attempts to earmark uncommon words for the aid of the reader.

This medical approach to describing the body through new vocabulary presented non-technical authors with fresh material to attract their audiences. As I explore in later chapters, the similar language used by medical writers to describe humans and animals allowed for opportunities to problematize what a human is.

Hippocratic language in particular has received an increasing amount of attention over the last few decades. Several studies have shown that treatises in the collection reveal a frequent, although often inconsistent, use of language that differs from that found in other

prose.¹³ These findings suggest that medical writers had special interests that required the use of uncommon, and at times proprietary, language to describe various aspects of their profession, including types of disease, pain, and medical treatment.¹⁴ My study confirms that the same holds true for some anatomical terminology in the HC.

Research on Hippocratic contributions to anatomical term creation generally has been overshadowed by an interest in lexical ambiguity of certain common terms.¹⁵ Far more scholarly attention to term creation has been paid to the anatomical language of Hellenistic medicine.¹⁶ This is, to a degree, understandable. The continuity of a larger number of technical terms for the body from the 3rd century BCE to today's Western medicine has encouraged this focus.¹⁷ As well, the sheer bulk of technical Greek anatomical terms coined after the Classical period has overshadowed (and often displaced) the fewer number of body-words used by the earlier Hippocratics. These broad approaches in scholarship to the evaluation of medical terminology

13 Studies have focused on a variety of facets of the profession. For example, Brock 1961 on the vocabulary of pain in the Hippocratic Corpus; Lopez-Ferez 1999 focussing especially on ordinary verbs appropriated by Hippocratic writers to describe the progression of illnesses, bodily processes, etc.; Lopez-Ferez 2006 on sexual metaphors; Goffart 2000 on obstetric vocabulary; Patsioti and Rose 1995 on the terms ἀποπληξία (paralysis), ἐπίληψις (epilepsy), and κεφαλαλγία (headache).

14 The greatest growth of medical technical language was in the area of disease classification. The author of *Regimen in Acute Diseases*, for example, laments that nonprofessionals often appear to be physicians, since learning disease names is so easily done while learning their actual treatment is far more difficult (2) (οἱ γὰρ μὴ ἰητροὶ ἰητροὶ δοκεῦσιν εἶναι μάλιστα διὰ ταύτας τὰς νόσους ῥηίδιον γὰρ τὰ ὀνόματα ἐκμανθάνειν). Evidence from Hippocratic writings suggests that this assessment is probably true. There are over 200 names for diseases in the Hippocratic Corpus. Most of these are either named after a notable symptom (*hemorrhoids* – ‘flux of blood’) or the location of the illness (*peripneumonia* - ‘[medical condition] around the lungs,’ *ophthalmia* – ‘[medical condition of] the eyes’). For discussion, see Potter 1988: 41, and further Byl 2011 ch. 4.

15 Chantraine 1972 from an analysis of the terms κοιλία, γαστήρ, and στόμαχος concludes that the Hippocratic Corpus had no standard term for the stomach, yet authors were internally consistent in their word use. See also Roura 1972: 320-22 for a similar appraisal of κοιλία, γαστήρ, and νηδύς (but cf. Benveniste 1965 for the uniform use of these terms later in the *NT*). For discussions of the amorphous vocabulary in the Hippocratic Corpus for ‘bodily channels’ (e.g. φλέψ and νεῦρα) see Craik 2009a: 108-10 and Lloyd 1983: 152-53. For a discussion of καρδίη and the general claim that there is no uniform terminology in the HC see Langholf 1990: 51. See Schironi 2010: 345 for several additional examples of this tendency.

16 Skoda 1988, for example, although discussing some Archaic and Classical terms for the body, tends to focus on the more plentiful vocabulary found in such authors as Erotian, Pollux, and Galen. His primary interest in this work is to illustrate the process of medical (anatomical and pathological) term-creation through metaphor. See further Nutton 2004: 132 for Herophilus’ ‘striking names’ for some anatomical parts that he discovered, and which have been retained in modern medical terminology.

17 On the heavy influence of post-Classical medical terminology on modern Western anatomical language, see Scarborough 1992: 3-29 and Sakai 2007.

provide a better understanding of diachronic changes to medical language over hundreds of years. However, in doing so, they also dilute the important contributions made during the 5th and 4th centuries.

The contributions that Hippocratic authors made to previous anatomical knowledge has been disputed. Some scholars have discounted the level of anatomical knowledge in the HC. For example, Pioreschi describes Hippocratic anatomical knowledge as ‘limited,’ and derived ‘from observations made on the battlefield, from examination of wounds, and, sometimes, from imagination.’¹⁸ But such a comment undervalues the progress that Hippocratic authors made. I instead agree with Sigerist’s conclusions that Hippocratic anatomical knowledge, although rudimentary by today’s standards, was ‘infinitely superior’ to Homeric knowledge, and that the ‘ancients knew more anatomy than we commonly assume.’¹⁹

Evidence of this can be found in new terms for body parts in the HC. Hippocratic writers’ increased attention to anatomy encouraged the use of new vocabulary to relate their findings. Roura, one of the few scholars to specifically study Hippocratic anatomical terms, has concluded that medical authors added to both Homeric vocabulary and to contemporary prose language. His survey of several words concludes that Hippocratic anatomical words can be categorized into three broad categories:²⁰

- 1) common terms directly borrowed from Homeric Greek that share the same semantic scope;
- 2) common terms borrowed from Homer, but with altered meanings; and
- 3) newly-coined terms.

18 Pioreschi 1996: 257. Nutton 2004: 77 admits a general understanding of the structure of the internal body, but still regards it as limited. Similar evaluations of Hippocratic anatomy appear often in modern medical journals, e.g. Christopoulou-Aletra, Gigis, and Paraskevas 2000 and Eknoyan 1988.

19 Sigerist 1961: 34, 277.

20 Roura 1972.

My study, which examines a larger selection of terms, confirms this and expands upon the third class. A significant portion of classical anatomical vocabulary is seen already in the Homeric poems, and most of these can be considered part of the core Greek anatomical lexicon. Some non-Homeric terms appear frequently within both the HC and non-medical writings. Other terms appear in the HC, but rarely if ever outside of it. The existence of this last class suggests that some anatomical terms – or at least their specialized meanings – were created by the medical community.

3.1. Earlier vocabulary in the Hippocratic Corpus

Most Homeric anatomical terms also appear in the HC, which shows medical writers' debt to preexisting vocabulary.²¹ Of the 119 anatomical words used in the epics, 103 appear at least once in these medical writings.²² There is general consistency between the Homeric and Hippocratic meanings for most of these terms.²³ However, the meaning of several words that appear in the epics is changed in the HC. Some of the basic anatomical words are used in different contexts. In the HC, the term κεφαλή (*head*), for example, had the extended meaning of the top end of a long bone (*Art.* 61, *Fract.* 45, *Mochl.* 8); αὐχὴν (*neck*) is similarly used for the area of a long bone directly below the 'head' (*Art.* 55, *Mochl.* 1), but it is also used for the

21 Erotian in his study of Hippocratic language remarks that classical Greek medical language was very similar to Homeric (*Onom.* 33 and Craik 2001a: 85). On the close similarity between Homeric and Hippocratic language, see Leumann 1950: 308-15. Irigoien 1980 has also shown the debt that medical authors owed to Homeric vocabulary.

22 I have identified 16 Homeric anatomical terms that do not appear in the HC: ἄγοστός (*flat of the hand*) e.g. *Il.* 11.425, 13.520; ἄκνηστις (*spine*) *Od.* 10.161 (*hapax*); δέμας (*bodily frame / form*) e.g. *Il.* 1.114, *Od.* 2.267; ἔγκατα (*inner parts / internal organs*) e.g. *Il.* 11.176, *Od.* 9.293; ἐπισκύνιον (*eyebrow ridge*) *Il.* 17.136 (*hapax*); ἦτορ (*heart*) e.g. *Il.* 1.187, *Od.* 1.47; κῆρ, κέαρ (*heart*) *Il.* 4.272, *Od.* 7.309; κάρη (*head*) e.g. *Il.* 2.259, *Od.* 5.285; κόρη (*temple*) e.g. *Il.* 4.502, 13.576; κώληψ (*hollow of the knee*) *Od.* 23.726 (*hapax*); λαυκανίη (*throat*) e.g. *Il.* 22.325, 24.642; λόφος (*nape of the neck*) *Il.* 10.573 (*hapax*); μήδεα (*genitals*) e.g. *Il.* 3.208, *Od.* 18.87; παρειά (*cheek*) e.g. *Il.* 11.393, *Od.* 18.172; πραπίδες (*midriff / diaphragm*) e.g. *Il.* 18.482; *Od.* 7.92; ῥέθος (*face / limb*) *Il.* 22.67, 361; χολάδες (*bowels / guts*) *Il.* 4.526, 21.180.

23 Thus, ὀφθαλμός meant 'eye' in both the epics and HC; κνήμη (*shin*) does not change in its basic meaning, nor does γλῶσσα (*tongue*), ποῦς (*foot*), or γόνυ (*knee*). Terms for most of the major internal structures and parts already identified in the epics continue to be used unchanged, such as ὀστέον (*bone*), and the organs above the diaphragm (καρδίη, ἦπαρ, πλεύμονες). These will remain part of the core anatomical Greek vocabulary in antiquity.

neck of the uterus (*Mul.* 230). The term στόμα (*mouth*) was used to refer to other orifices, including the womb (ὑστέρα, *Aph.* 5.46; μήτρα, *Aēr.* 21), vessels (φλεβίον, *Vict.* 56; τεύχος, *Loc. Hom.* 47), and the bladder (κύστις, *Aēr.* 9).

Although these secondary meanings do not suggest much lexical innovation, they do illustrate both that doctors were interested in labelling and subdividing parts clearly and that they had no specific preexisting term for them. This must not have presented much of a barrier for a reader's comprehension, provided that he or she was familiar with the parts to which the author was referring. Presumably any classical Greek would have been familiar with the primary meanings of these common anatomical terms for the head, the neck, and the mouth. In each case the author provides another anatomical point of reference to show that he is not using the term in its ordinary sense, for examples *Mul.* 230: τῶν μητρέων...ὁ ἀύχην (*the neck of uteruses*); and *Vict.* 56: τὰ στόματα τῶν φλεβίων (*the mouths of the small vessels*). This illustrates the economy of Hippocratic authors when labelling parts of the body, although the use of these terms outside of their normal senses is evidence of a more nuanced construction of the human body.

Another important change is that psychic functions of the internal organs that are described regularly in the epics are virtually lost in the HC. The unclear epic terms πράπιδες and ἦτορ do not appear in the HC. Φρένες, though, is used regularly, but with a restricted meaning.²⁴ Although it is used in the epics and in other classical writings in both psychological and anatomical senses,²⁵ Hippocratic writers were either disparaging about its psychological functions or did not use it in this way.²⁶ They instead used the term φρένες in the strict

24 Langholf 1990: 44.

25 For examples of φρένες used in its psychological sense see *Il.* 1.362, 3.442, 5.493, 13.394; for examples of its anatomical use see *Il.* 11.411, 16.481, *Od.* 9.301. For classical authors' use of the term in a psychological sense, see *Ar. Pax* 1067, *Xen. Mem.* 4.55, and *And. De reditu suo* 7.

26 See *Aēr.* 20 and below for further discussion.

anatomical sense of ‘diaphragm,’ including it along with other prominent material structures within the body.²⁷

The intervening poetry from the 7th and 6th centuries BCE between the Homeric epics and the earliest Hippocratic writings shows no significant additions to Homeric anatomical vocabulary. Only ten new terms appear in surviving literature during this time. Half of these refer either to parts of the genital region²⁸ or to the buttocks,²⁹ and are added only by the lyric poet Archilochus (7th cent. BCE) and the iambic poet Hipponax (6th cent. BCE). Most of these terms probably existed when the Homeric poems were composed, but for the sake of propriety were excluded from the epics.³⁰ The remaining five terms refer to other external parts and do not suggest a more refined lexicon for the human body than is seen in the Homeric epics.³¹

3.2. Methods and sources for anatomical investigation: corpses, the clinic, and animals

Hippocratic writers’ primary concern with understanding sickness helped to limit their scope when creating their medical models of the body. Although there is no consistent model in the collection, Hippocratic writers usually assigned the cause of disease to a patient’s surplus or

27 This is a change from the Homeric meaning of the term, which might have been ‘lungs.’ See section 2.5.2 above for discussion. *Aph.* 6.18 includes the φρένες along with other vital internal structures like the bladder, brain, heart, entrails, stomach, and liver; *Coac.* 499 describes it in a similar manner: Ἀποθνήσκουσι δὲ μάλιστα ἐκ τῶν τραυμάτων, ἢν τις ἐγκέφαλον τραυθῆ ἢ ῥαχίτην μύελον ἢ ἡπαρ ἢ φρένας ἢ καρδίην ἢ κύστιν ἢ φλέβα τῶν παχειῶν. ‘Wounds are especially lethal when one suffers them to the brain, the spinal cord, the liver, the diaphragm (φρένες), the heart, the bladder, or any of the large blood vessels.’ (translation following Chadwick 1950: 264) For further examples see *Int.* 48.3; *Art.* 41.26; *Carn.* 5.11; and *Loc. Hom.* 3.28.

28 ὄρχις (*testicle*), Hippon. 92; πέος (*penis*), Archil. 327 and 328; and τράμις (*perineum*), Hippon. 114a.

29 πρωκτός (*buttocks*), Archil. 187, Hippon. 104; and πυγή (*buttocks*), Archil. 187 (and possibly πυγεῶν at Hippon. 92, although the meaning of the term is dubious [LSJ, s.v.]).

30 See Bakhtin 1965: 354 for his comments that epic poems rarely emphasize bodily parts in the contexts of ingestion and defecation (e.g. the mouth, stomach, and buttocks). We can include sexual organs here as well.

31 δάκτυλος (*finger*), Alc. 346 and Hippon. 104 (but represented earlier in the Homeric expression ῥοδοδάκτυλος Ἥως, ‘rosy-fingered Dawn,’ e.g. *Il.* 1.477, *Od.* 2.1); μασχάλη (*armpit*), *h.Merc.* 242; οὔθαρα (*breast*), *h.Cer.* 450 used in a metaphor for the Rharus plain (cf. Homeric μαζός, e.g. *Il.* 22.80, *Od.* 11.448); τράχηλος (*neck*), Hippon. 103 and 118 (cf. Homeric ἀρχήν, e.g. *Il.* 7.262, *Od.* 8.136); and ὠλένη (*elbow*), *h.Merc.* 388 (cf. Homeric ἀγκών, e.g. *Il.* 10.80).

deficiency of one or more fluid types (e.g. blood, phlegm, yellow bile, and black bile).³² Their focus on fluids as the cause of disease, known as humoral theory, was a practical way to understand the hidden causes of a sickness, since doctors believed that they could see these fluids being expelled from a patient.

Investigation into the various internal parts of the human body as a way to understand how and where fluids travelled helped to define Hippocratic medicine. Gundert has convincingly argued that classical medical authors shared three general beliefs about the material body:³³

- 1) Parts have particular structures
- 2) Physiological and pathological processes are often located in specific parts.
- 3) The roles parts play are dependent on and determined by their specific structure, texture, and quality.

Her categorization accurately reflects the Hippocratic understanding of physiological functions of these parts and of how parts are important to health. Gundert is neither interested in vocabulary nor in how Hippocratic authors use it to label these structures.³⁴ In addition, she restricts her study to the importance of anatomical parts in humoral theory, which excludes the importance of anatomical parts in osteological and speculative works. I shall discuss these parts below.

32 See for example Grmek 2002: 248: 'For nearly all Hippocratic authors, disease was the expression of a disorder – not in the primary constituents, but in the fluid components of the human body.' For the most complete description of the humoral theory in the HC, see *Nat. Hom.* 5. See Balzer and Eleftheriadis 1991 and Jouanna 1999: 314-17 for useful surveys of Hippocratic humoral theories. Schoener 1964 remains one of the best and fullest analyses of ancient humoral theories. This humoral approach to medicine was extremely persistent in Western medical thought up until the early modern period (particularly through Galen's appropriation of the theory). See recently DeMaitre 2013: 16-19.

33 Gundert 1992: 463, quoted verbatim. See further Leder 1992 and Jouanna 1999: 248-49 for discussions of Hippocratic theoretical and dogmatic models for the construction of the body, which are more concerned with basic elements of the body than they are with anatomical parts. Since these investigations are not related to anatomical vocabulary *per se*, I do not discuss them here.

34 She generally does not refer to Greek terms in her study, although she does use transliterations on occasions in footnotes.

3.2.1. The human body: observations of corpses and patients

As far as we know, classical Greek physicians never practised human dissection to fill in their anatomical knowledge. No Hippocratic author mentions the use of human cadavers in their investigations. It is generally believed that this practice was disallowed on religious, moral, and aesthetic grounds.³⁵ The earliest source explicitly mentioning human dissection is the 2nd century CE Roman medical writer Celsus, who names both Herophilus (*ca.* 330/320-260/50 BCE) and Erasistratus (4th -3rd century BCE) as the first practitioners (*Proem* 23). Although there is no clear range for when human dissection was permitted, it evidently no longer was by the 2nd century CE when Galen was writing (129 - *ca.* 216 CE).³⁶ It is likely that the practice was only allowed in antiquity in the peculiar scientific environment of Ptolemaic Alexandria.³⁷

Since Hippocratic writers were either unable or unwilling to dissect humans, they had to use various alternative methods to investigate the body:³⁸

[Because Hippocratic doctors] had to reconstruct the internal structures of the human body on the basis either of what they saw or felt by means of superficial examination or of what they observed in animal dissections, it is not surprising that their knowledge of [the internal body], which remained for the most part closed off to them, should have been partial, erroneous, and indeed quite odd.

Although Jouanna is correct in his assessment, anatomical research in the HC provided a foundation both for reasons to study the human body in detail and for ways of studying and organizing it. That their descriptions are ‘quite odd’ to a modern reader is a result of the various

35 Von Staden 1989: 141. See also Longrigg 1988 (esp. 458-59); Phillips 1973: 41; Kudlien 1969, and Edelstein 1967: 268-301.

36 For example, in *Anat. Admin.* 2.23 K he describes the dissection of apes as good sources for human anatomy, which suggests that humans could not be directly dissected.

37 Von Staden 1989: 141-42, 146. He here calls specific attention to the ‘ambitious Macedonian patrons of science (i.e. the Ptolemies)’ and to the ‘frontiersmanship’ of the new city of Alexandria that was less concerned with older values.

38 Jouanna 1999: 310.

sources that doctors used to construct their medical body, and should not be considered an indictment of their contributions.³⁹

It is likely that a physician would have had the opportunity to observe and examine desiccated remains of exposed bodies in addition to superficial examinations of patients. This would explain the fairly accurate descriptions of human skeletal anatomy in some Hippocratic treatises.⁴⁰ Although there is no direct proof of a Hippocratic physician recording observations of a corpse, we do have indirect evidence that such opportunities were available to him.⁴¹ We also have evidence from non-Hippocratic authors. Plato, for instance, tells an anecdote about an otherwise unknown Leontius, who while walking outside the gates of Athens came upon the exposed bodies of executed felons. He immediately shielded his eyes, but when curiosity overcame him he proceeded to look closely at the corpses (*R.* 439e).⁴² Galen, writing in the 2nd century CE in an environment that also did not allow human autopsy, reports that he had several

39 Cf. Singer 1956: xxiv who illustrates the prejudices from our own modern Western anatomical models when interpreting ancient texts. After dissecting a Rhesus monkey following Galen's *Anat. Admin.*, he comments: 'nearly every sentence in the book began to take rational form, and to assume anatomical intelligibility.' For a common example of differences in classification, nerves and tendons are not differentiated in the HC, and are both classified using the general term *νεῦρα* or 'cords' (Skinner 1961: 186, Lloyd 1983: 152, Jouanna 2002: 57). There is nothing incorrect about calling both nerves and tendons 'cords,' since they both are cord-like. It is the later identification of functions that encouraged a distinction between the parts. Malomo, Idowu, and Osuagwu 2006: 100 note that several languages still use the same term for nerves and tendons.

40 For the Hippocratics' accurate knowledge of the skeletal system see Phillips 1973: 42 and Jouanna 1999: 312. Scarborough 1992: 124 describes osteology as the third oldest medical practice, preceded by midwifery and herbalism: 'bones represent one of the oldest studies of a medical nature because burial customs and earliest agriculture generally included a precise knowledge of how bones fit together and how bones survived the longest of a human being's mortal existence.' Passages that describe the sutures of the skull such as we see in *Loc. Hom.* 6 and *VC* 1, despite some errors, suggest the opportunity to examine a human skull (or skulls) was available to the authors. For a short discussion of the types of mistakes made, see Craik 1998b: 121.

41 The author of *Flat.* (12.17) does imply that when the body dries all that remain are the bones (*ὀστέα*), tendons (*νεῦρα*) and skin (*ρῖνός*, or in some MSS 'fasciae' [*ἴνες*]). Although this may suggest exposure to human remains, it may also refer to comparative observations made from animal carcasses. Campbell 1888: 15 tantalizingly remarks, but without providing further detail, that Hippocrates (*viz.* a Hippocratic author) has seen a skeleton displayed within a temple of Asklepios, presumably for the purpose of studying bone-structure. My own search for such a passage within the corpus has been unfruitful.

42 Similarly, for his research into the human skeletal structure the 16th century anatomist Andreas Vesalius first relied upon the observation of a body of an exposed criminal picked clean by scavenger birds outside the city walls (Kornell 2000: 99). Such morbid interest in human anatomy is persistent. An excellent modern parallel is Günther von Hagens' popular travelling exhibit 'Body Worlds,' in which plasticized corpses are displayed in varying anatomized states. See vom Lehn 2006 for a useful discussion of the exhibit and its questionable artistic and intellectual values.

opportunities to view the skeletal remains of bodies after their graves had been eroded by a river's current.⁴³ Hippocratic physicians almost certainly had the same or similar opportunities to view corpses in various states of decomposition, if they so wished.

Most clinical opportunities to observe the internal human body were probably limited to serious injuries that exposed a patient's insides. The author of *Epidemics* 5.26, a physician's clinical case description, records witnessing a particularly revealing wound. He explains that his patient had been run over by a cart across the ribs, which left several of them broken. When pus began to form below the broken bones, the doctor made an incision below the spleen to drain the area. He then observed that there was a tear in the intestinal membrane, or peritoneum (δέρτρον), and that an area between the kidney and bone had become putrefied. The author's description suggests that the man's injury was severe enough to allow him to inspect these internal parts through the wound. Such chance opportunities for studying the human body were probably too limiting for physicians, who felt that an understanding of the hidden body was important for their profession.

3.2.2. Animal bodies: comparative anatomy

There is far more, albeit often indirect, evidence that Hippocratic authors observed animals to fill in their gaps of knowledge about the construction of the human body. The most important parts

43 *Anat. Admin.* 9 2.221 K. Later at 2.224-25 Galen tells how doctors when he was younger would research aspects of internal anatomy by observing people suffering from anthrax. This disease, he tells us, would cause the skin and sometimes the flesh to fall off of a patient, and physicians would poke and prod the exposed areas. It is possible that Hippocratic physicians had similar opportunities (for descriptions of anthrax in the HC, see *Epid.* 2.1.1, 3.3.7, *Aff.* 35). As a comparative example, the 6th century BCE Indian anatomist Susruta purposefully exposed cadavers for autopsy. Working in a religious environment that forbade direct contact with corpses, Susruta selected whole bodies free from signs of pathology, placed them in wooden cages, and then in the river. After several days the remains would be removed. By this time the skin and flesh would be sufficiently decomposed to allow for the layers of the body to be removed easily with a brush, thereby circumventing religious taboos (Persaud 1984: 25-27).

for the comparative anatomist were those that require cutting to be viewed. Otherwise, surface observation of a human subject would have been sufficient and preferable.⁴⁴ This method is of course still commonly used today in the medical and biological sciences. Under cursory examination, animals – especially mammals that were hunted or raised for food – appear to have many of the same parts as we do. By observing animals, someone could see that many share the same number of major organs: one heart, a set of lungs with two lobes, a pair of kidneys, a single liver, and so on. Animals also have many of the same structures – bones, muscles, tendons, and tubes – that appear to be like our own, at least superficially.

In many cases, we can only assume an author's debt to comparative anatomy. In an analysis of *Glands*, a work describing the human lymphatic system, Craik argues that the author almost certainly used animals as sources of information.⁴⁵ His understanding of internal anatomy implies some level of dissection; however, he never mentions how he collected his information. At other times, it is an author's mistakes about human anatomy that suggests his tacit reliance upon animal dissection. The author of *Bones*, a post-classical digest of earlier medical ideas, incorrectly states that the human liver has five lobes (1). The human liver has only four lobes;⁴⁶ a pig's liver, however, does have five.⁴⁷ Von Staden has therefore proposed

44 See Arist. *HA* 494b for his comments that the exterior parts (μόρια τὰ πρὸς ἔξω) of the body have mostly all received names and are widely known through people's familiarity with them, yet those internal parts (τὰ ἐντός) are conversely not very well known. He therefore argues that someone must look to animals (ζῶα) to understand the corresponding parts of human, since they are very similar to ours (ἔχει παραπλησίαν τὴν φύσιν). For Aristotle as the father of comparative anatomy, see Solmsen 1963: 478, Catani 2007: 602, and Crivellato and Domenico 2007: 478. Galen, however, believed that Diocles, perhaps writing in the same time as Aristotle, authored the first work on animal anatomy, and that he used information about a mule's womb to speculate about that of a female human (*Anat. Admin.* 2.281-82 K). For further discussion, see Nutton 2004: 120-21. For a full discussion of Diocles' dates, see van der Eijk 2000: xxxi-xxxiv, who concludes that we can only say that he lived sometime after Hippocrates and before Herophilus and Erasistratus, and gives 400-300 BCE as a broad range for his life. See Lloyd 1975b on the problematic evidence for Alcmaeon's (6th -5th cent.) earlier use of comparative anatomy, which he concludes was less formalized than Aristotle's approach.

45 Craik 2009: 36. Similarly, Langholf 1990: 147 believes that *Epid.* 2.4.1-2, which describes the course of veins and nerves within the body, are notes taken after animal dissections.

46 The left, right, caudite and quadrate.

47 The left lateral, left central, right lateral, right central, and caudite.

that this author, along with others who made similar comments, was relying too closely upon observations of animal organs when commenting upon those of humans.⁴⁸

One comparison between the human body and that of other animals is made in *Sacred Disease*, a treatise on the natural origin of epilepsy.⁴⁹ Some of the debt to comparative anatomy for his theory is only implied. In one place, he makes this observation:

ὁ ἐγκέφαλος ἐστὶ τοῦ ἀνθρώπου διπλός ὡσπερ καὶ τοῖσιν ἄλλοισι ζώοις. τὸ δὲ μέσον αὐτοῦ διείργει μῆνιγξ λεπτή.

The brain of a human is in two parts, just like in other living things. A thin membrane divides it in the middle.

His description suggests that he had some knowledge about the appearance of both human and animal brains. A likely possibility is that he knew basically what the human brain looked like, probably from serious head wounds,⁵⁰ but then filled in his knowledge by observing the brains of at least one animal more closely. The author again expresses his reliance upon animal dissection more explicitly later when he wants to prove that a buildup of phlegm in the brain is the ultimate cause of epilepsy (14):

48 Von Staden 1989: 163. See also *Anat.* 1, probably a later Hellenistic addition to the HC, and Craik 1998: 149 for discussion. She notes that there are either four or five lobes according to Rufus, and that this confusion over numbers of lobes might also be due to variations in what an observer considered to be a separate lobe. For a similar conclusion and further discussion of specific examples of the intersection between humans and animals in the HC, see Ayache 1997. Ayache is most concerned with Hippocratic notions of the quality of ‘living’ as a class-type shared by humans and other animals, rather than with the use of animals by Hippocratics in comparative anatomy.

49 Jouanna 1999: 412 dates this work to the second half of the fifth century, which places it among the earliest of the Hippocratic writings. The author of this work attempts to make a strong claim for the natural, as opposed to divine, origin of epilepsy. In his opinion, it is just as sacred as any other sickness (5). He therefore argues that an understanding of these diseases can be reached by a knowledge of the human body: epilepsy in particular is caused by an overabundance of phlegm in the tubes (φλέβες) in the neck that lead to the head; this buildup prevents respiration to the brain (ἐγκέφαλος), the location of thought (6-10). For analyses of this work’s importance for the science of medicine, see van der Eijk 1990, Jouanna 1999: 182 and Nutton 2004: 64-66.

50 *Wounds to the Head*, for example, provides several descriptions of serious injuries to the skull that would have allowed at least a partial view of the brain. In section 17, a description of skull fractures, the author refers to the μῆνιγξ (the cerebral membrane), which illustrates that such wounds would have been revealing enough for a physician to gain some idea of this structure (see further sections 2 and 15 for the treatment of other especially revealing head injuries).

γνοίη δ' ἄν τις τόδε μάλιστα τοῖσι προβάτοισι τοῖσι καταλήπτοισι γινομένοις ὑπὸ τῆς νούσου ταύτης καὶ μάλιστα τῆσιν αἰξίν· ἦν διακόψης τὴν κεφαλὴν, εὐρήσεις τὸν ἐγκέφαλον ὑγρὸν ἔοντα καὶ ὕδρωπος περίπλεων καὶ κακὸν ὄζοντα, καὶ ἐν τούτῳ δηλονότι γνώση ὅτι οὐχ ὁ θεὸς τὸ σῶμα λυμαίνεται, ἀλλ' ἡ νοῦσος.

The best proof for this comes from ruminants that are gripped by this disease, especially sheep. If you cut open the head, you will find that the brain is moist, very aqueous, and smells bad. This is clear proof that it is not a god that is injuring the body, but rather the disease.

As Lloyd remarks, this is observation but not yet experimentation: the author of *Sacred Disease* did not examine the whole of the sheep's body for abnormalities, nor from what we know did he examine the head of a healthy sheep under the same conditions.⁵¹ The author believed that the origin of epilepsy was in the head, expected to discover something abnormal, and this is exactly what he found.⁵² Nevertheless, the author clearly reveals here both his willingness to use other comparative sources to understand the human body better as well as his belief that such models are useful.

There are a handful of other instances in the HC when an author uses broad analogies about living things to help to explain human bodies. The author of *Breaths*, a speculative work on the role of air in disease, remarks on animals' need for air (5).⁵³ The author of *Humors* comments more specifically on anatomical similarities when he describes the function of the stomach (11):

ὥσπερ τοῖσι δένδρεσιν ἡ γῆ, οὕτω τοῖσι ζώοισιν ἡ γαστήρ· καὶ τρέφει, καὶ θερμαίνει, καὶ ψύχει, ψύχει μὲν κενουμένη, θερμαίνει δὲ πληρουμένη·

Like the earth is to trees, so is the stomach to living things: it nourishes, cools, and heats [*sc.* the body]; it cools as it empties, and heats as it fills.

51 The author's comment that the sheep's brain smells bad allows for the possibility that he had smelled other brains that did not have the same odour; however, it is possible that he is only equating bad smells with sickness as elsewhere in the corpus (e.g. *Int.* 31, of ears; *Loc. Hom.* 47, of female genitalia; *Mul.* 185, of mouth; *Aph.* 4.81, of urine; *Prog.* 13, of vomit).

52 Lloyd 1970: 54-55; see Jouanna 2012: 63-64 for a similar appraisal of this passage.

53 μεγάλη κοινωνία ἅπασι τοῖσι ζώοισι τοῦ ἥερος ἐστὶν ('The greatest commonality between all living things is air'). For a similar comment, see *Vict.* 38.

Using animals as evidence, the author of *Internal Afflictions* intended to prove that a form of dropsy which develops in the lungs is caused by tubercles, or pathological round swellings (23):

ὥς δὲ γίνεται καὶ ἀπὸ φυμάτων ὕδερως, τόδε μοι μαρτύριον καὶ ἐν βοῖ καὶ ἐν κυνὶ καὶ ἐν ὑί· μάλιστα γὰρ τῶν τετραπόδων ἐν τούτοισι γίνεται φύματα ἐν τῷ πλεύμονι ἄπερ ἔχει ὕδωρ, διαταμῶν δ' ἂν γνοίης τάχιστα, ρεύσεται γὰρ ὕδωρ·

In my opinion, [this illness] in an ox, dog, or pig is evidence that dropsy [*sc.* in both humans and other animals] is caused by tubercles of fluid, since among quadrupeds tubercles containing fluid occur most often in these animals. You can know this easily by cutting the animal open, for fluid will flow [from the incision].

In each of these cases, the author is not systematically examining animals in order to know more about the human body. Rather, he seems to be using casual observations of animals gathered from daily experience as supporting evidence for his specific argument.

Several Homeric words also have expanded meanings in the HC that confuse the boundaries between living humans and dead animals. Terms that are almost always used in the epics for edible or removed parts of dead animals and humans, such as σάρξ and κρέας (*flesh*) and δέρμα (*skin/hide*), are used more broadly in the HC to describe living bodies as well. In non-medical classical writings, these food-terms were still used for dead animals, but also sometimes for humans (although usually in descriptions of humans being eaten, of injuries, or of disease, not of a general or healthy body).⁵⁴ The terms often have the same meanings in the HC,

54 E.g. δέρμα: Hdt. 2.87 (of a corpse), 4.64 (skin of enemies used by the Scythians to make clothing), 5.25 (flayed skin of Sisamnes), 3.110 (animal hide); E. *Cyc.* 526 (animal hide); Ar. *Pax* 745 (scourged human skin), *Ran.* 527 (lion skin); Xen. *Mem.* 2.1.17 (scourged human skin); Pl. *Phd.* 98d (human skin, in a critique of the natural philosopher Anaxagoras' language, see further chapter 7 below), *Smp.* 190e (human skin, in Aristophanes' parody of the doctor Eryximachus, see further chapter 7 below); R. 370e, *Lg.* 849c (leather); *Prt.* 321a (animal hide); σάρξ: Hdt. 1.128 (Harpagus unwittingly eating his own son); S. *Tr.* (Heracles' flesh eaten by the cloak), *Ph.* 1156 (Philoctetes' morbid flesh); E. *Tr.* 439 (cattle meat), *Med.* 1199 (human flesh burnt from bone), *Hipp.* 1342 (the mangled flesh of Hippolytus); Xen. *Eq.* 1.5 (horse flesh); Pl. *Phd.* 96c (human, again in a commentary on Anaxagoras' theories); *Smp.* 207d, 211e (human, in Aristophanes' parody of Eryximachus); *Grg.* 518c, *Lg.* 797e (human flesh, in the context of disease); κρέας: Hdt. 2.47 (animal meat), 3.99 (diseased human flesh); Th. 4.16.1 (animal meat); E. *Cyc.* 125 (the human meal of the Cyclops); Ar. *Ran.* 508 (bird meat), *Eq.* 456 (of a healthy human, but perhaps a parody on the Sausage-seller's trade); Pl. *Euthd.* 301c, R. 338c (animal meat).

but they were used more regularly in descriptions of the healthy or ‘normal’ living body.⁵⁵ These changes of meaning, from strictly animal or edible dead parts to living human parts, suggest a way of viewing the human body in the Classical period, and in the HC in particular, that is different from the Homeric epics. The lexical dichotomies between dead and living/animal and human in medical writings are less pronounced, which leads to language for parts of ‘a body’ that transcends human/animal boundaries.

Another good example of this divergence from Homeric vocabulary is the term σπλάγχνα (*innards*, probably the organs above the diaphragm).⁵⁶ The term is never used for humans in the Homeric poems, even when describing exposed human remains.⁵⁷ In the Classical period, the term σπλάγχνα continued to be used outside of the HC to describe internal parts of animals, especially in the context of sacrifice.⁵⁸ Hippocratic authors, however, only used the

55 E.g. δέρμα: *de Arte*; *Epid.* 2.1.7; *Morb. Sacr.* 3; *Gland.* 9; *Carn.* 9; σάρξ: *Fract.* 27; *Art.* 36; *Morb.* 1.20; *Ulc.* 10; *Epid.* 4.43; *Aēr.* 21; *Art.* 10; *Loc. Hom.* 2, 4; *Carn.* 1; κρέας (usually used in the HC for edible flesh): *Morb.* 2.34 (specifically nasal polyps), *Carn.* 16, 17 (living human).

56 It is difficult to identify exactly what parts of the body constitute the Hippocratic σπλάγχνα. In instances when some definition is possible through an author’s reference to other parts, it appears as if the σπλάγχνα are above the hypochondrial line (i.e. above the bottom of the rib cage). *Morb.* 2.69 for example records the downward movement of pain from the σπλάγχνα to the lower abdomen (νειάριη γαστήρ). In another discussion of the movement of an illness, *Afflictions* 10 contrasts the σπλάγχνα with the bowels or belly (κοιλίη), and locates them near the diaphragm (φρένες). *VM* 19 describes fluid aggravating the σπλάγχνα and θώραξ (*upper-chest*), but it is unclear whether the σπλάγχνα are contained within the chest or contrasted with it (καὶ δῆξιες σπλάγχνων καὶ θώρακος, καὶ ἀπορίη). They are elsewhere differentiated from the πλευρά (*sides/ribs*) and ἄρθρα (*limbs*), e.g. *Coac.* 453: Δυσεντερίη ἀκαίρως ἐπιστᾶσα ἀπόστασιν ἐν πλευροῖσιν, ἢ σπλάγχνοισιν, ἢ ἐν ἄρθροισι ποιέει· (‘When dysentery makes an untimely movement, it does so into the lungs, the *splangchna*, or the limbs.’).

57 E.g. *Il.* 2.246-47; *Od.* 3.461, 20.252 (only of animals).

58 See for examples *SEG* 21:541 (375-350 BCE, Attica); *HGK* 4 (c. 350 BCE, Cos). There is very limited evidence about what the σπλάγχνα contain from accounts of sacrifice or butchery. Berthiaume 1982: 60-61 cites Aristotle (*PA* 667b) as one of the few Classical authors to provide a detailed list of the organs contained within the term σπλάγχνα: the heart, lungs, liver, spleen, and kidneys. See also Robertson 1999, esp. 178-79 and van Straten 2006: 23-24 for further discussion of σπλάγχνα in the context of butchery and sacrifice. Their comments about the contents of the σπλάγχνα are vague. Van Straten, for example, writes: ‘After the animal had been killed, the thoracic (and abdominal?) cavity was carefully opened up with a lengthwise incision, and some of the inner organs (*splangchna*) were extracted.’

term σπλάγχνα to describe internal parts of humans, which is uncommon in other classical Greek writings.⁵⁹

Although there is evidence that Hippocratic writers did recognize anatomical differences between species of living things (ζῶα),⁶⁰ at least some of them explicitly state that humans belong to this broad class. Sometimes this similarity was on a very basic level. As the author of *Nature of Humans* remarks (3):⁶¹

ἀνάγκη τοίνυν, τῆς φύσιος τοιαύτης ὑπαρχούσης καὶ τῶν ἄλλων ἀπάντων καὶ τῆς τοῦ ἀνθρώπου, μὴ ἔν εἶναι τὸν ἄνθρωπον.

Since the nature of both all the other [*sc.* things⁶²] and humans [is created from multiple substances in equilibrium], it is therefore necessary that a human is not a single thing.

We only have a few explicit references to the species of animals to which humans can be compared, but it appears that physicians restricted their analogies to larger mammals, such as cattle or dogs.⁶³ In most applications of comparative anatomy, it seems that the writer simply assumes that certain animals have basically the same type, number, and arrangement of internal parts. For example, the author of *Epidemics* 6.4.6 observes that the intestines of humans are like those of dogs, only larger (τὰ κῶλα ἔχει οἷα κυνὸς, μείζω δέ').

Despite the usefulness of comparative anatomy, Hippocratic writers in general were overconfident in assuming so close a connection between human bodies and those of other

59 Most instances when σπλάγχνα refers to human parts are in poetry, e.g. A. *Sept.* 1030 (specifically *womb*); E. *Alc.* 1008; Or. 1200; S. *Aj.* 994. The word is rare in 5th and 4th century prose before Aristotle, and is used only by Plato for humans at *Ti.* 72c (in a medical context) and *R.* 565d (on the eating of human flesh).

60 E.g. *Nat. Puer.* 15 on the litters produced by dogs and pigs (although he uses this as evidence that humans can also have multiple births from a single act of intercourse); *Art.* 8 on the uncloven hooves (μῶνυχα) of animals (ζῶα), and later (13) on the human collar bone (κληίς) and shoulder blade (ὠμοπλάτη) as different from other animals; *Mochl.* 5 on the common structure (κοινὸν σχῆμα) of cattle and human bones.

61 See also *Vict.* 3, 22, and *Carn.* 1 (on similarity of animal life); *Int.* 7 (analogies between human dispositions and those of horses and dogs); *Flat.* 4 (on living things as a general class, τὰ θνητὰ ζῶα); *Epid.* 4.14 (an analogy between morbid human urine and horse's); *Mochl.* 1 (on humans as ζῶα in a discussion of bones).

62 Later in the section, the author clarifies that he means the nature of both living and non-living things: τῶν ζῶων ἐστὶν ἡ φύσις, καὶ τῶν ἄλλων πάντων.

63 But see *Vict.* 16 for an example of an analogy between the growth of human foetuses and plants.

animals. This would continue even after the Hellenistic period, when physicians like Herophilus and Erasistratus showed the important medical reasons for an intensive study of the body's construction. Seven hundred years after the earliest Hippocratics, Galen still assumed that accurate knowledge of very detailed parts of our bodies could be extrapolated through studying animals, although he was more cautious than his predecessors were. Singer in his edition of Galen's *On Anatomical Procedures*, a work ostensibly on the subject of human anatomy, sums up the document by concluding that, '[t]his text is...a description of the soft parts of the ape imposed on the skeleton of man.'⁶⁴ Although Galen had a more mature approach to investigating the internal body, the convenience of using animals as proxies was too attractive to avoid.⁶⁵

We might expect that these analogies between us and beasts could complicate boundaries of classification. It is therefore telling that in all Hippocratic discussions of animal anatomy that I could find, writers show no trace of discomfort about the use of such subjects to provide insight into the human body. The reason for this seems to be that medical writers conceptually abstracted distinct anatomical parts from their sources. The animals used – apparently limited to livestock and dogs – meant that the authors' subjects were different enough from humans to avoid direct comparisons to our bodies as they were being anatomized. This is quite different from Galen's later use of monkeys and apes (subjects that were unavailable to Hippocratic

64 Singer 1956: xix. In his introduction to *On Anatomical Procedures*, Galen suggests using apes if someone cannot find a human skeleton, either by visiting Alexandria – a place where they actually still studied the bones themselves – or by happenstance. These skeletons, however, cannot be from just any apes: they must be those that are most similar to humans (τῶν μὲν δὴ πιθήκων τοὺς ἀνθρώποειδεστάτους ἐκλεγόμενος 2.23 K). On Galen's attempt to revitalize anatomical studies in the face of the rationalist-empiricist method, with its 'metaphysically aloof attitude toward the body,' see Cosans 1997. For a technical discussion of Galen's public experimentation upon pigs (one of his favourite animals to dissect, besides apes), see Gross 1998. Galen, however, continued to make false analogies between the internal structures of humans and other mammals. See for example Rocca 2008: 254 for a discussion of Galen's description of the retriform plexus, a series of fine arteries at the base of some mammals brains (e.g. oxen, goats, sheep, and pigs). Galen confidently describes them as present in the human brain, although neither humans nor primates have them. See also Nutton 2004: 231: '[Galen's] human womb has cotyledons like that of a ruminant; his thyroid cartilage is that of a pig; and his belief that the left kidney was lower in the body than the right is true of apes, but not humans.'

65 This reliance upon animals as proxies for humans of course persists to today, when a significant amount of testing (e.g. of cosmetics, drugs, and medical procedures) is still performed on animals.

writers), animals that he considered close enough in appearance to humans to cause strong reactions from those who viewed his dissections.⁶⁶ Hippocratic authors also used animal dissections in very limited ways. They were not interested in exploring broader questions about what constitutes life or what the soul is. Rather, writers focused their attention on specific material structures, such as the brain, the lungs, and the liver. When taken out of their original contexts, the animals to which they once belonged, these parts essentially became independent entities without marked associations with any specific living thing: a brain was a brain and a lung was a lung, no matter where they were found. In later chapters, however, we shall see that not all Greek writers were comfortable with this homology between humans and animals.

3.3. Expansion of anatomical vocabulary: creating the textual medical body

The avenues for anatomical investigation – clinical, post mortem, and animal observations – provided several opportunities for classical Greek physicians to expand their understanding of the body. It is important to keep in mind, though, that this new-found anatomical knowledge was rarely derived from a patient’s own body. Instead, through the use of human corpses and animals, physicians were creating a different model of the body that did not align well with the complete and enclosed living *human* body. Specialized vocabulary to explain these parts must have further removed the verbalized body in medical texts from the ones of daily experience.

Hippocratic innovations to anatomical vocabulary generally fall into three groups:

- 1) Divisions of the superficial body;
- 2) specific parts of bones; and
- 3) internal parts or structures that doctors believed either held or conveyed bodily fluids.

66 E.g. *Anat. Admin.* 2.690 K. In this passage Galen explains that the reason why he used pigs for his public demonstrations was because the sight of apes in such a state is disgusting (εἰδεχθῆς). See further Gleason 2009: 110-113 for discussion of Galen’s occasional discomfort with using animals subjects for his anatomical displays.

These three areas of term-creation mirror Hippocratic interests in advancing knowledge about what the human body was and how it functioned. Since only a small fraction of classical Greek writings have survived, neither a word's first nor its only appearance in medical writings necessarily proves that it was coined by a physician. However, as Byl has argued in his study of Hippocratic language for disease, the large number of terms that only appear in the HC before Aristotle give good reason to suspect that medical writers were using uncommon language. Byl concludes that this is evidence that something approaching a technical vocabulary was developing within the profession.⁶⁷ As I discuss below, several anatomical terms in the HC are also restricted to these medical writings during the Classical period, which points to a technical language for the body that is similar to that for diseases.

These lexical contributions have been somewhat obscured by the diversity of language used by different Hippocratic authors. The lack of standardized vocabulary in particular would have posed a serious hindrance to someone trying to learn about the body through reading texts alone; however, much medical information in the Classical period must have been transmitted orally.⁶⁸ Since there appears to have been little incentive to teach the art of medicine beyond a certain limited sphere of people it would usually not have been necessary to ensure someone's writing was intelligible to a broad readership. The result was a heterogeneous vocabulary. As

⁶⁷ Byl 2011: 69.

⁶⁸ For example, see Totelin 2008: 21-66 on the oral transmission of pharmacological knowledge. In a modern Western medical setting in which text-based education is highly emphasized, it is far easier to mark technical language as restricted to one class of professionals or another. As Singer 1959: 1 comments: 'Naked-eye human anatomy [*viz.* in the English world] employs some five thousand technical terms. The wretched student is still urged to acquire about half that number...How many or how few of these words of *The Art* the medical man carries with him into practice no one can say. My own guess is that they amount to under a thousand, but even that is a considerable vocabulary.'

Lloyd has observed, Greek medical texts (including those from the Classical period) suffered from an ‘organizational or institutional weakness’ within the medical profession as a whole.⁶⁹

Unusual terms for parts of the body that required the use of special language would have been difficult for a non-professional to understand. The chief reason for this is the frequent use of metaphorical language.⁷⁰ Many anatomical words have different, more common, meanings in the vernacular. For example κοτύλη, which has a common meaning of ‘cup,’⁷¹ in an anatomical sense means ‘joint-socket’;⁷² ἔδρη, the common word for ‘seat’⁷³ at times can have the euphemistic meaning ‘anus’ in the HC.⁷⁴ A second type of labelling, although less common than metaphors, is the use of compound words. Some terms are formed through the relative position of the part that was being described, such as ἀντικνημίων (*shin*, lit. the opposite side of the κνημή [*shank*])⁷⁵ and ὑπογλωσσίς (*the underside of the tongue*, lit. ‘under the tongue’).⁷⁶ Others are formed more abstractly, for examples ἐπίφυσις (*epiphysis*, the end of a long bone; lit. ‘outgrowth’)⁷⁷ and ἐπίπλοον (*omentum*, intestinal membrane; lit. ‘sailing over,’ because it sits

69 Lloyd 1983: 165. See further Langholf 1990: 41-51 for specific examples of the range of meanings for χολή, φρένες, and καρδίη. We should assume, however, that there was some uniformity of vocabulary use within specific medical circles themselves. See Jouanna 2012: 116-17, Langholf 1990: 234-35, and Edelstein 1964: 39-41 for discussions of the formation of professional groups of physicians within the larger community, similar to those of blacksmiths and cobblers. Our strongest evidence for this comes from the Hippocratic *Oath*, which contains the vow that the art (τέχνη) of medicine is to be taught to one’s own sons, to his teacher’s sons, and to other students who have taken the oath, but to no one else (7-12).

70 For this observation in the context of Galen’s terminology, see Singer 1956: xviii: ‘The Greeks, unlike ourselves, had no classical language from which to draw scientific terms. These they made either by combinations of words, or by giving ordinary words a special meaning, or by using short descriptive clauses...The obstacles to understanding for those ancient readers who did not dissect and had no anatomical figures were insuperable. Until modern times, and until the revival of the practice of dissection and the introduction of representational art, the anatomical works of Galen were almost incomprehensible.’

71 *Od.* 15.312; *Hdt.* 6.57; *Fist.* 7.

72 *Art.* 79, *Mochl.* 40.

73 *Il.* 12.311; *Hdt.* 9.41.

74 E.g. *Aër.* 3, *Aph.* 5.22.

75 *Fract.* 18, 23; *Ulc.* 25.

76 *Morb.* 2.11 (used later at 31 for swelling in this area).

77 E.g. *Fract.* 4, *Art.* 45. See below for discussion.

on top of the intestines like a sail).⁷⁸ These last two examples would presumably be especially difficult for someone not familiar with either internal anatomy or the specific terminology to comprehend, since the terms do not contain any anatomical reference points to help the reader.

Compared with later medical writers, Hippocratic authors were either less aware of or less concerned about the problems of vocabulary standardization or conflicting terminology for the human body.⁷⁹ The HC has few of these usual marks that signpost such awareness.⁸⁰ Undoubtedly, there is often a range of possible meaning for a term and different authors used different terms for the same parts of the body. But we can assume that each author usually was using language that he believed his readers would understand, or at the very least that he would try to assist the reader when the identification of a part of the body was problematic.

3.3.1. The exterior body: divisions of the torso

Classical doctors relied heavily upon surface observations of patients, since their clinical practices tended to concentrate on external, non-invasive, diagnosis and treatment that relied upon outward signs to reveal internal disorders. Objective data was collected by observing the

78 E.g. *Aph.* 5.46; *Gland.* 5; *Loc. Hom.* 24. Craik 1998a *ad loc.* cites the appearance of the word at *Hdt.* 2.47 in the context of an Egyptian sacrifice as evidence for the importance of the omentum in haruspicy, although she maintains that medical writers also considered the part to be important for health. The Homeric term δέρτρον (*Od.* 11.579) is also used with the same meaning (*omentum*) at *Epid.* 5.26.

79 The opposite becomes increasingly true after the Hellenistic period and the wider circulation of writing within the Mediterranean. In this environment, a greater need for clarity is required from the texts. Rufus' *Onom.* (1st century CE) is one of the earliest attempts to systematically order not only the parts of the human body, but also the names for them (but see Lloyd 1983: 165 for the difficulties that Rufus faced). A century later Galen was often still faced with the task of dealing with various terms for the same structure (*Anat. Admin.* 9 [2.275 K (on the outgrowth of the scapula), 550 (on the perineal membrane)]; *Oss. Tir.* [2.775 K (on the ankle)]; *Dis. Uter.* [2.890 K (on part of the womb)]. See further Lloyd 1983: 150 n.106.

80 The pairing of synonyms or discussions about etymology in order to provide clarity for anatomical terms are absent in the Hippocratic Corpus. For a possible rare exception, see the description of the μύες κροταφίται καὶ μασσητήρες (the 'temporal' and 'chewing' muscles) at *Art.* 30. Galen in his commentary on the treatise says that it is unclear whether these terms refer to two different muscle groups or are synonyms for one (18.429 K). See below for further discussion of this passage. On the tendency of pairing synonyms in early English medical texts see Norri 1998: 191-98.

patient for signs of abnormal behaviour or surface features, by palpation, and by auscultation.⁸¹ The patient's subjective description of the level, type, and location of any pain or discomfort is likewise recorded during the clinical examination.⁸² The physician at the end of this process constructed mental and verbal maps of the afflicted body that he could superimpose upon a body in its healthy state.

This is confirmed by the frequent use of the term χωρίον (*region*), a term more commonly used for geographical descriptions.⁸³ For examples, *Fractures* 26 mentions the region of a wound (χωρίον ἔλκεος); and *Nature of Humans* 9 comments on the regions for phlebotomy.⁸⁴ The author of *Diseases of Women* calls particular attention to the importance of learning the 'regions' of different types of diseases (17):⁸⁵

Χρὴ δὲ σκεψάμενον τῶν νοσημάτων τὰς δυνάμιας καὶ ὑψηγέμενον τὰς προφάσιας ὡς χρὴ ἐξ ὧν αἱ νοῦσοι γίνονται, ἐπὶ τὰ ἄλλα ἰέναι ὧδε καὶ τὰ ἀμφὶ τὰ χωρία ἵησθαι.

Someone who examines the properties of diseases and who describes their causes must also examine and describe the regions where the diseases originate, all of the other regions where they travel, and the treatments around these regions.

81 See Langholf 1990: 54-56 for further discussion of determination of illness through these types of observation.

82 The clinical notes of the *Epidemics* provide several examples of this, e.g. 2.2.9 pain in a patient's kidneys (κατὰ νεφροῦς ἀλγήματα); 3.2.12 heart pain (καρδίην ὑπήλγεε); 6.2.22 a patient's hard spleen (σπλῆν σκληρὸς); 7.55 swelling below the liver (καθ' ἧπαρ ἔπαρμα); 4.42 a hard bladder (κύστις σκληρή). DeHart 1999: 361-64 suggests that the Hippocratic practice of searching the outside of the body for signs of disease originates from Near Eastern practises of divination. This is a possibility, although Nutton 2004: 42 correctly observes that no Hippocratic author acknowledges any debt to non-Greek sources for his information, so such conclusions must remain tentative. It is more likely that Near Eastern and Greek approaches developed independently of one another. The limited opportunities to examine the internal body would have compelled Greek physicians to derive most of their conclusions from surface examination; there is no need to suspect that they borrowed this knowledge from another culture.

83 E.g. Th. 2.19.2 (Acharmia); Hdt. 2.29 (Arabia); Ar. *Nu.* 209 (Attica).

84 I.e. the opening of veins to drain excess blood from the body.

85 There are well over 100 descriptions of different regions (χωρία) of the body in the HC. For further examples, see *Nat. Hom.* (the region of the bladder); *VM* 20 (the region of the nose); *Prog.* 12 (the region below the diaphragm); *Prorrh.* 2.11 (the region of the armpits).

Like a geographical map, the physician used distinct physical features as landmarks, and augmented the number of these parts by adding more or less arbitrary divisions of regions. The author of *Epidemics 3* illustrates this process in a daily clinical report (3.1.3):

ἔξ ἀριστεροῦ ὀλίγον, ἄκρητον ἐρρῆ· διαχωρήματα ὅμοια· οὖρα ὅμοια· ἐφίδρωσε περὶ κεφαλὴν καὶ κληΐδας· σπλὴν ἐπήρθη· μηροῦ ὀδύνη κατ' ἴξιν· ὑποχονδρίου δεξιοῦ ξύντασις ὑπολάπαρος·

A small flow of unmixed blood from the left side; feces and urine unchanged; he sweats around the head and the collar-bones; spleen raised; pain on the same side of the thigh [i.e. the left thigh]; loose tension beneath the right hypochondrium.

The author is interested in recording the current details of the illness in order to track its progression and to compare it with other cases. He therefore divides his patient's external body both horizontally and laterally, which allows him to frame the body into regions.⁸⁶

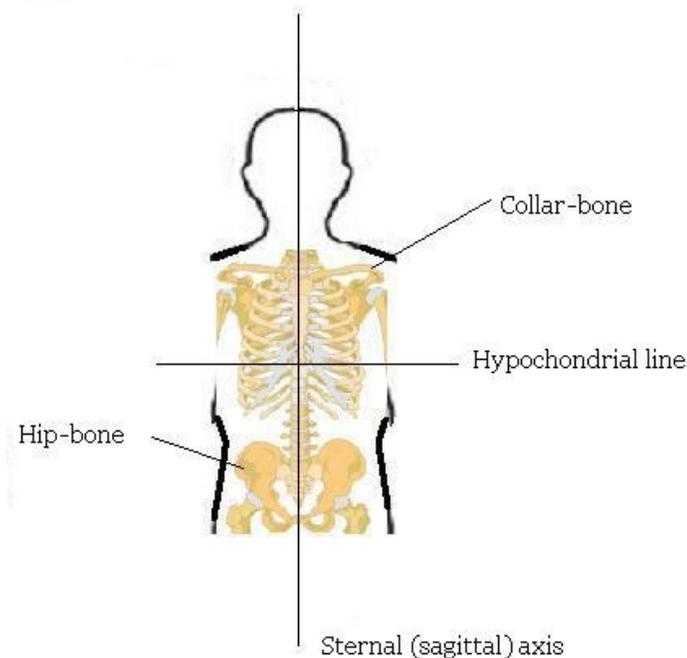


Fig. 3.1: Clinical plane division of the human body

It was particularly important for the doctor recording these details to note what side of the body a pain or anomaly (i.e. a deviation from a patient's normal state) occurred, because he

⁸⁶ The author of *Epid.* 6.5 similarly records the general occurrence of pain on the sides, stretching of the hypochondria, swelling of the spleen, and hemorrhaging from the nostril all on the same side (κατ' ἴξιν).

knew that this division could help him to identify the offending parts beneath the surface. In the medical context, it was practically efficient to divide the superficial body into right and left halves along a central vertical, or ‘sagittal,’ axis.⁸⁷ Also evident in the above excerpt from *Epidemics* 3 is that the author makes use of externally perceptible, prominent, internal features: the collar bone (κλήϊς), the lower sternum or xiphoid process (χόνδρος),⁸⁸ and the thigh (μηρός).⁸⁹ All three of these features, especially the χόνδρος, are among the most common landmarks used in the HC for distinguishing and describing the external topography of the body.⁹⁰

The term ὑποχόνδριον (lit. ‘below the xiphoid process’) is a good example of what is probably a uniquely medical word for dividing the torso. It is used 119 times within the HC, and appears in later Hippocratic works another 22 times. Although it is a common word in medical writings, there is no example of ὑποχόνδριον being used by a non-medical author before the 3rd century CE, and even then it is in a quasi-scientific astrological context.⁹¹ Every previous instance of the word’s appearance outside of the HC is in the context of either medicine or biology.⁹²

87 Based on observations from injuries, the author of *Epid.* 7.1 realized that the right and left hemispheres of the brain affected the opposite sides of the body. For a similar observation see *VC* 14.

88 Not the more general meaning of all cartilage found in the body (e.g. *Carn.* 16.4: χόνδριον μαλακὸν ὅκως περ σπόγγος, οὔτε κρέας οὔτε ὀστέον. ‘cartilage: soft, similar to a sponge, neither flesh nor bone’). The area below the chondrium is divided into left and right regions (the hypochondria) by the sternum (or sagittal) line (see *Fig.* 3.1).

89 Other landmarks in this area commonly used are the ἵξυς (hip), ὀσφύς (sacrum, lower back region where it is located) and ἰσχίος (hip-joint).

90 Also, like ‘spleen’ in the example from *Epid.* 3.3 cited above, terms for internal parts are occasionally used to mean the surrounding superficial area. See further Grmek 1977: 12-13.

91 Porphyry in his *Introduction to Ptolemy’s Tetrabiblos*, an astrological work, uses the term ὑποχόνδριον in a list of anatomical parts that are affected by different signs of the zodiac (Boer and Weinstock 5.4.216). A possible exception to the term’s appearance in non-technical writings before the 3rd century CE is its appearance in the *Septuagint* at *Kings* 1, 31.3, where Saul is described as being wounded in the ὑποχόνδριον during a battle.

92 E.g. Diocles fr. 109, 110, etc.; Arist. *HA* 493a, 496b, [Arist.] *Prob.* 953b, etc.; Dsc. *de Materia Medica* 1.109, 3.23, etc.

The reason for the limitation of the term to medical or biological works is because of its specificity. The common Greek parlance had a number of words to refer to the lower torso or divisions of it, for example *νηδύς* (*abdomen*), *κοιλία* (*body cavity/belly*), and *γαστήρ* (*paunch/belly*), which must have sufficed for general communication.⁹³ Medical authors, however, recognized that discomfort in and externally visual changes to a specific area of the trunk of the body often accompanied some illnesses. There was also a general understanding that problems with the parts in this area below the surface were to blame.⁹⁴ Physicians, upon seeing patterns develop in this region – one not so low as the abdomen and not so high as the upper chest – seem to have coined a specific term to record it.⁹⁵ This exemplifies the very usefulness of the term in medical writings: physicians were aware that there were important internal parts that could be located on the surface of a patient’s body using superficial reference points. This results in the need for generalizing medical terms like ‘the area below the chondrial line,’ and ‘the parts around the navel.’ In the same way as the external labels, these internal parts received generalizing terms, such as *σπλάγχνα* (organs above the diaphragm) and *ἔντερα* (organs below the diaphragm).

3.3.2. The internal body: the bones

Hippocratic writers show limited innovation in the terminology for specific bones. In many cases, an author will just refer to the bone by its relation to a part of the external body. For

93 E.g. *νηδύς*: Hes. *Th.* 487; A. *Eum.* 138; Hdt. 2.47; Arist. *HA* 633a; *κοιλία*: Hdt. 2.88; Ar. *Eq.* 356; Pl. *Ti.* 80d4; *γαστήρ*: Thgn. 1.920; E. *Cyc.* 326; Xen. *Cyr.* 7.1.37. For Hippocratic examples patients’ of stomach complaints and of abnormal appearances of the belly region, see (discomfort in the *γαστήρ*): *Aff.* 21, *Loc. Hom.* 20, *Epid.* 7.97; (abnormal appearance of the *γαστήρ*): *Int.* 42, *Morb.* 2.69, *Epid.* 2.2.20.

94 Pain in the right hypochondrium is the most commonly described of the two, since it is the location of the liver, and lower, the appendix (which is never explicitly described in the HC). See for examples *Epid.* 4.7 and *Int.* 10. The author of *Prognostics* 1.7 informs us that swelling in the region of the left hypochondrium is less harmful than the right, and probably so: aside from the left kidney, the left hypochondrium most importantly holds the spleen. Complaints of pain or observable swelling in this area more often point to the swelling of the spleen as a symptom of some other illness (e.g., hepatitis, anaemia, and syphilis) than it does an disorder of the organ itself (e.g. splenetic cysts).

95 Consider, for example, the clinical note at *Epid.* 2.3.6: τὰ πνεύματα ἐν ὑποχονδρίοισιν ἔπαρσις μαλακὴ καὶ ἔντασις οὐδετέρη. (‘Air in the *hypochondria*: a soft swelling without any tension.’)

example, like our ‘breast bone’ the sternum is called τὸ ἀπὸ τοῦ στήθεος ὀστέον (*Art.* 15); and the bones of the shin (in English medical language, the tibia and fibula) are similarly called the ‘shin bones,’ τὰ τῆς κνήμης ὀστέα (*Art.* 53). However, there are four examples (two from *Places in Humans*⁹⁶) of terms that do not appear elsewhere with this meaning in classical writings:

- 1) ζύγωμα (*bar*, for the cheek bone/zygomatic arch)⁹⁷
- 2) πλάτη (*oar*, for the shoulder blade);⁹⁸
- 3) περόνη (*pin*, for the small bone of the arm, also known as the radius);⁹⁹
- 4) σπάθη (*blade*, for the broad ribs).¹⁰⁰

Craik has convincingly argued that *Places in Humans* is perhaps one of the earliest Hippocratic writings, composed sometime in the first half of the 5th century.¹⁰¹ If this dating is correct, then it suggests an early interest in both exploring internal anatomy and term creation.

Hippocratic authors also use some uncommon terminology for points or parts of articulation, such as ἐπιμύλις (*millstone*, but at *Mochl.* 1 *kneecap*)¹⁰² and κοτυληδών (*cup*, but e.g. at *Int.* 230 *socket of the hip* [ἰσχίον]). In these instances the authors seem to assume that the reader is already familiar with these terms, or at the very least will understand which parts of the body he is discussing. We also find Hippocratic words for the parts of bones and their functions

96 Craik 1998a: 113 argues that the work contains Doric terms, which might account for the work’s unusual language.

97 *Art.* 30.

98 *Loc. Hom.* 6.

99 *Loc. Hom.* 6.

100 *Gland.* 14.

101 Craik 1998a: 28-29.

102 Cf. the synonym μύλη (lit. ‘millstone’) at *Loc. Hom.* 6 (but meaning ‘molar’ at *Hum.* 9). The 2nd century CE geographer Pausanias later remarks on the technical nature of this term in a description of a large skeleton that was reported to have a knee-pan the size of a boy’s Pentathlon discus (1.35.5). He calls these parts of the skeleton ‘the bones upon the knee’ (τὰ ἐπὶ τοῖς γόνασιν ὀστᾶ), but adds that they are ‘called *mulai* by physicians’ (καλούμενας δὲ ὑπὸ τῶν ἰατρῶν μύλας). This provides strong evidence for the existence of a medical technical vocabulary by Pausanias’ time. The term is also used with this meaning outside of the HC at Arist. *HA* 494a5 and perhaps at Com. Adesp. fr. 450 (τὰ δ’ εἰς τὸ πρόσθεν ἀδυνατεῖ μύλης ὑπο.). The term ἐπιγουνίς (lit. ‘upon the knee,’ used earlier in the *Odyssey* to refer to the thigh muscle (17.224), also means ‘knee-pan’ at *Art.* 70 and *Oss.* 17. The word’s different meaning in the *Odyssey* can be explained as either a) an independent invention; or b) a later shift of referent based on confusion over the original Homeric sense (for a description of this process, see Brown 1979).

that strictly speaking are descriptive, not metaphorical. The term ἐπίφυσις appears 19 times in *Joints, Fractures, and Instruments of Reduction* and is not used again with this meaning outside of medical writings in antiquity.¹⁰³ The literal meaning of the word is ‘outgrowth.’¹⁰⁴ In the context of bones, though, the term refers to the rounded end of a long bone where it connects to another at the process (ἀπόφυσις),¹⁰⁵ the place where the ligaments attach to the bone (*Fig. 3.2*). A similarly rare word for a part of the bone is διπλόη (lit. ‘fold’),¹⁰⁶ which denotes the spongy layer of bone in the skull (*Fig. 3.3*).¹⁰⁷ It is used several times with this meaning, but only in the HC.¹⁰⁸ Each of these terms for parts of bones denote attention that likely extended beyond general observations of bones to technical investigation.

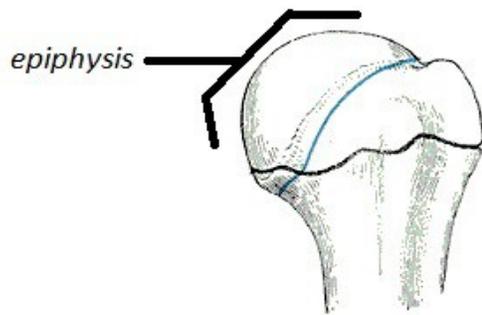


Fig. 3.2: Epiphysis of the humerus, or bone of the upper arm (Gray's Anatomy 1918, fig. 211, modified)

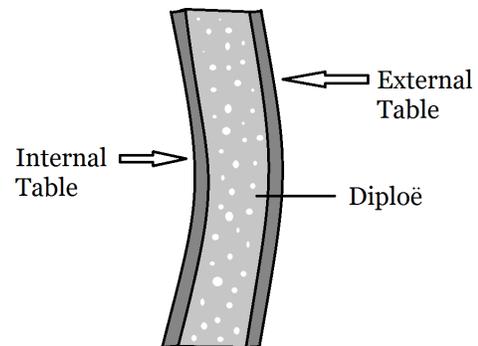


Fig. 3.3: Cross-section of the skull bone (the diploë)

103 *Art.* 27, 45, 87; *Fract.* 4, 12 (x3), 13 (x2), 46; *Mochl.* 1 (x5), 17, 40.

104 LSJ, *s.v.* It is therefore used to describe irregular outgrowths of skin, e.g. *Epid.* 3.3.7: ἐπιφύσεις βλεφάρων (an outgrowth on the eyelids); and the growth of plants, e.g. *Thphr. HP* 1.1.2.

105 For examples of ἀπόφυσις, see *Mochl.* 1, *Art.* 45. Cf. διάφυσις at *Fract.* 12, the spinous process of the tibia (LSJ, *s.v.*).

106 E.g. *Pl.* *Sph.* 267e where διπλόη means the weak part in iron.

107 It is located between two hard layers of bone, known in modern medical language as the external table (superficial layer) and the internal table (internal layer).

108 *VC* 1, 17; *Morb.* 2.7; *Epid.* 5.16. Cf. *Rufus Onom.* 135: Διπλόη δὲ τὸ μεταξύ τῶν ὀστέων τοῦ κρανίου, ὅθεν δὴ ἡ ῥίς ἄρχεται. (‘The *diploë* is between the bones of the skull, where the nose begins’).

3.3.3. The internal body: ‘containers’ and ‘conduits’

In Hippocratic understandings of disease (νοῦσος), which were based on theories of fluids travelling within the body, it was more important for physicians to be concerned with fluids and with the structures that contained and transmitted them than with bones:¹⁰⁹

Hippocratic medicine explains the workings of the body in terms of ‘structures’ and ‘fluids,’ the interactions of which are regarded as an anatomico-physiological unity: nature (*physis*).

The author of *Traditional Medicine* (22) strongly encouraged an understanding of the structures (σχήματα) of the body, the material parts,¹¹⁰ and the role that they play in diseases (ὅσα παθήματα γίνεται ἀπο σχημάτων).¹¹¹ This focus was a major limiting factor to Hippocratic anatomical enquiry, since their primary interests were not in mapping the entire body, but only in those parts that they considered to be important for the treatment of injuries or disease.

Doctors were aware that many body structures important to health were hidden, which made them the most difficult to examine.¹¹² For example, the author of *The Art*, a work defending the existence of the art of medicine, describes two classes of diseases: that which is visible from the surface and that which is hidden. He contends that the first type of disease is obvious (τὰ φανερά) to the medical examiner, but adds that the other class of diseases, which he calls unclear (ἄδηλα), must also be studied (10):

δεῖ γε μὴν αὐτὴν [sc. ἰητρικὴ τέχνην] μηδὲ πρὸς τὰ ἥσσον φανερὰ ἀπορέειν·

The [medical art] itself must not overlook those [conditions] that are less visible.

109 Potter 1988: 38. See also Craik 2009a: 107: ‘In the Hippocratic Corpus, the body is viewed as important bits (organs, viscera such as lungs, liver, kidneys) and orifices (including eyes, ears, genitals) linked by hollow tubes, ducts or channels.’

110 Schiefsky 2005a *ad loc.* notes that the meaning of the term at this point in the text is vague, but adds that later discussion in the chapter makes it clear that the author refers to ‘internal organs as well as anything in the body that has a distinctive structure or configuration.’

111 He sees some structures as being good for holding liquids – such as the skull, the inner organs, and the womb – but adds that some are able to attract fluids better than others because of their construction, such as the spongy composition of the female breast, lungs, and spleen. See further Gundert 1992: 458-60 for a discussion of how the author *VM* fits these structures within his broader system of human physiology.

112 See García Gual 2000: xvi-xx for a similar assessment of internal anatomy in the Hippocratic Corpus, which he refers to as ‘el oscuro interior del cuerpo humano.’

The author then continues to describe different structures within the human body, and emphasizes that every part has *νηδύες*, or ‘cavities,’ which can contain either good or bad humors.¹¹³ A good doctor, he argues, should know about these internal parts of the body, so that he can treat hidden diseases.¹¹⁴

Hippocratic writings show minimal innovation in the identification and labelling of specific organs, mainly because most major organs had long been recognized. Descriptions of the heart (*καρδίη*), lungs (*πλεύμονες*), liver (*ἥπαρ*), and kidneys (*νεφροί*) in the Homeric epics are evidence of the early recognition of these organs as well as of the durability of the terms for them. The same vocabulary continues to be used in the HC with no perceptible changes in meaning, although the positions of the organs within the body are sometimes unclear.¹¹⁵ The only term in the HC for an organ that does not appear in the epics is *σπλήν* (*spleen*, a fist-sized organ located on the left hand side of the stomach), which is used in both medical and non-medical writings in the Classical period.¹¹⁶

113 See Gundert 1992: 460 for further discussion of the importance of cavities in Hippocratic physiology.

114 Among the parts he lists in this section in are the *σάρξ* (*flesh*), *δέρμα* (*skin*), *βραχίονες* (*upper-arms*), *κνήμαι* (*shins*), *θώραξ* (*torso*), *ἥπαρ* (*liver*), *κεφαλή* (*head*), *ἐγκέφαλος* (*brain*), *νώτον* (*back*), and *πλεύμονες* (*lungs*). He is especially interested in the flesh (*σάρξ*) as a location where fluids collect. He adds that *φλέβες* (*blood vessels*) and *νεῦρα* (*tendons*), both of which can be separated from the flesh, are also responsible for conveying these fluids.

115 Cf. Lonie 1981: 285-86 for a discussion of *Morb.* 4.36, which comments on the correct terminology for *καρδίη*, ‘heart’ (see p. 113 below for passage). Lonie remarks that both Galen and Erotian describe *καρδίη* as a synonym for orifice of the stomach (i.e. the lower terminus of the esophagus) and the heart, and that Galen mentions that ‘the ancients’ would refer to the orifice of the stomach as the *καρδία* (Galen, *Plac. Hp. et Pl.* 2.8.4-13 K; Erotian, s.v. *καρδιώσσειν*; on the ‘ancient’ use of the term, see Galen, *San. Tuenda* 6.14.1 K and *Loc. Aff.* 5.6 K). Lonie provides further examples within the Hippocratic Corpus where the term *καρδία* appears to be used where one would expect ‘liver’ (e.g. *Epid.* 1.13.4, 5.80; *Prorrh.* 1.72). Lonie concludes, though, that when the Hippocratic texts read ‘heart’ the authors must have meant ‘heart.’ It was not their vocabulary that was wrong, but rather their understanding of the position of internal organs. See also Langholf 1990: 44: ‘[I]n numerous Hippocratic passages one can hardly determine whether *kardiē* means the heart or the *ventriculus* (= *gastēr*) or the *ostium cardiacum*. Apart from this ambiguity, however, *kardiē* in Hippocrates has a very restricted meaning: it always means an organ, never a function; it is never used metaphorically.’

116 E.g. *VM* 22, *Art.* 14, *Loc. Hom.* 3. In non-medical writings, the spleen is most often referred to as an edible animal part, e.g. *Hdt.* 2.47, *Ar. fr.* 233 K.-A., *Alexis fr.* 275 K.-A., although it is also used as a psychological organ in humans, e.g. *Ar. Th.* 2.

Like the Homeric poems, Hippocratic writers show a tendency towards generalizing the parts of the bowels. Although the Homeric term bladder (κύστις) is often mentioned,¹¹⁷ the other digestive organs (*intestines*) are usually denoted using unspecific vocabulary.¹¹⁸ For example, we see the general Homeric term ἔντερα (e.g. *Aph.* 6.24, *Aff.* 23, and frequently in non-medical writings), but also ἐντοσθίδια (*Epid.* 2.6.13; *Mul.* 230 [of a dog], *Alim.* 7, *Superf.* 7), which in the Classical period appears only once elsewhere in Aristotle (*PA* 684b). The Homeric term στόμαχος (*throat*),¹¹⁹ from which we derive our English ‘stomach,’ had two general senses in the HC: throat,¹²⁰ and more broadly, the entrance to some internal parts, such as the bladder (κύστις),¹²¹ stomach (γαστήρ),¹²² and the womb (μήτηρ).¹²³

Two of the greatest lexical contributions of Hippocratic authors in the area of internal anatomy was for the coinage of terms for structures that they believed either contained or carried fluids. These terms represent a changing model of the body in which discrete body parts, such as those mentioned in the Homeric poems (e.g. heart, lungs, liver), were linked together. There are at least five new uses of terms for membranes or containers of the body in the corpus:¹²⁴

- 1) ἐπίπλοον (*omentum*, fold of the peritoneum)¹²⁵
- 2) μεσεντέριον (*peritoneum*, abdominal membrane)¹²⁶

117 E.g. *Aph.* 5.22; *Aër.* 9; *Int.* 18.

118 But for an exception, see *Carn.* 13 and 19 for νῆστις (*jejunum*, the middle section of the lower intestinal tract located between the duodenum and the ileum). The term literally means ‘fasting,’ and was applied to the part because (presumably in animals) it appeared to be empty of digested food (LSJ, *s.v.*). For the term applied to animal anatomy, see Ar. fr. 518 K.-A. and Eub. fr. 63 K.-A.

119 *Il.* 2.291, 17.46, 19.265. For further discussion of the use of στόμαχος, see Chantraine 1972 and Lloyd 1983: 162. The word is derived from στόμα (*mouth*) denoting a mouth-like opening (cf. Lat. *orificium* [opening] from *os* [mouth] and Scarborough 1992: 191 for discussion of both terms).

120 E.g. *Epid.* 2.4.2., *Gland.* 17.

121 *Aër.* 9.

122 *Morb. Sacr.* 7.

123 *Mul.* 219, 217.

124 See also αἰγγεῖον *Epid.* 6.3.1 (cavity of the body, lit. ‘vessel’).

125 E.g. *Aph.* 5.46, *Coac.* 7.55, *Loc. Hom.* 3, *Prorrh.* 2.10.

126 Lit. ‘in the middle of the belly,’ *Epid.* 2.1.2. See also *Epid.* 6.4.5 for μεσόκωλον (*mesocolon*, a fold of the peritoneum) and *Vict.* 30 for ἐπιγάστριος (covering of the abdominal cavity).

3) μῆνιγξ (*membrane*)¹²⁷

4) τεύχεα (*container/vessel*, a generic term for parts that hold fluid)¹²⁸

5) χιτῶν (*membrane*)¹²⁹

The HC is also the first occurrence of the term ἄδην or ‘gland.’ It is a notable term, since its appearance indicates a medical approach to classifying and labelling bodily structures that is different from that of modern Western medicine. *Glands*, a treatise dedicated to their composition, locations, and role in causing disease,¹³⁰ describes them as parts of the body that are sponge-like, loose, and fatty (φύσις μὲν ἀύτερησι σπογγώδης, ἄρραιαὶ μὲν καὶ πίονες). The author further states that they are important for health because they are receptacles for excess fluids (1-2). The location of the major glands, the cervical (neck), axillary (arm pit/chest), and inguinal (groin), appear to have been widely familiar to Hippocratic authors.¹³¹ However, the term could also be used more broadly for other bodily structures that held fluid, such as breasts (μαζοί) or testicles (βουβῶνες).¹³² The word does not reappear in Greek literature until Galen.¹³³

127 E.g. *VC* 17 (*dura mater*, i.e. the membrane of the skull); at *Loc. Hom.* 2 the term is used for both the *dura mater* and the *pia mater* [see Craik 1998a *ad loc.*]; *Loc. Hom.* 2 (conjunctival membranes of the eye); *Mul.* 223 (endometrium, i.e. the membrane of the uterus). See also Lloyd 1993: 181-82 for a discussion of Empedocles’ study of the eye (fr. 84 DK = Arist. *De sens.* 437B, apparently a direct quotation of Empedocles’ poem). Here Empedocles describes μῆνιγγες, tissues (ὀθόνη, lit. *linen cloth*), and passages/hollows behind the eyes (χοόνη, lit. *funnel*). Galen mentions that Diocles (4th cent. BCE) called all membranes of the body μῆνιγγες (*Anat. Admin.* 2.176 K). See further van der Eijk 2000: 34 for Galen’s interest in Diocles’ vocabulary in this fragment.

128 Lit. ‘tool,’ or ‘armour.’ It is used in the Homeric epics for armour (e.g. *Il.* 14.381, 18.451), so *Gland.* 17 (the upper torso, τὰ ἄνω τεύχεα); *Loc. Hom.* 24 (‘cavities of the omentum [ἐπίπλοον]’; Craik 1998a *ad loc.* proposes that the term has the same meaning at *Il.* 21.335).

129 Lit. ‘garment.’ E.g. *Aph.* 7.45, *Coac.* 275 (peritoneum); *VM* 19 (membrane of the eye); *Carn.* 7 (the wall of the vessels).

130 See Craik 2009b: 1-10.

131 *Joints* 11, for example, uses ἄδην for the axillary glands in the armpit; *Epid.* 4.42 uses it for the cervical glands in the neck. See further Craik 2009b: 36.

132 μαζοί (*breasts*), *Gland.* 15; βουβῶνες (*testicles*), *Gland.* 4. See further Lloyd 1983: 153. Craik 2009b: 3 correctly refers to such definitions as ‘half-truths rather than outright error.’

133 E.g. *UP* 3.696 K, *Ars Medica* 1.319 K.

Hippocratic authors also described several types of tubes within the body – sometimes categorized under the generic term ποιοί (*ducts*)¹³⁴ – that they believed transported fluids, air, and food to the various internal containers. There are several examples:¹³⁵

- 6) ἄορτραί (*bronchial tubes, trachea*)¹³⁶
- 7) ἄρτηρίη (*trachea, pl. bronchial tubes; but also artery*)¹³⁷
- 8) βρόγχος (*trachea*); βρογχία (*bronchial tubes*)¹³⁸
- 9) οἰσοφάγος (*esophagus*)¹³⁹
- 10) οὐρήθρη (*urethra*)¹⁴⁰

Generally, physicians were interested in these parts because they understood them to be the locations either of sickness or of symptoms indicating sickness.¹⁴¹ However, writers also believed that knowing these parts were important for a broader understanding of how materials were transported through the body.¹⁴²

Hippocratic authors were especially interested in mapping the veins (φλέβες) for a similar reason: not because veins were necessarily the sites of sickness,¹⁴³ but because they helped to explain how it travelled within the body.¹⁴⁴ Although their general understanding of

134 E.g. *Flat.* 8; *Vict.* 35.

135 Cf. Homeric φάρυγξ, which is commonly used in the HC for the throat, e.g. *Coac.* 524, *Prorrh.* 1.11, *Morb.* 3.10, *Gland.* 14. It is also used by several non-technical writers, e.g. *Th.* 2.49; *E. Cycl.* 215, 356, 410, 592; *Ar.* fr. 625 K.-A. Another Homeric term λαίμος is also used with the same meaning at *Epid.* 2.6.6.

136 E.g. *Loc. Hom.* 14; *Coac.* 394; cf. ἄορτρον: *Morb.* 2.54 (*lobe of the lung*).

137 Trachea: *Epid.* 7.25, *Morb.* 2.53, *Aff.* 1; bronchial tubes: *Morb.* 1.22 (and so *Pl. Ti.* 70d2 and 78c5); cf. *Carn.* 5, *Aph.* 45, and *Alim.* 7, artery. At *Oss.* 10, a later compilation on the subject of bones (Jouanna 1999: 398), the word means ureter, i.e. the duct from the kidneys to the bladder. *Gland.* 6 refers to the ureters as ὄχετοί (lit. ‘pipes’).

138 E.g. βρόγχος: *Epid.* 5.63; *Morb.* 2.28; *Loc. Hom.* 10; *Alim.* 30. βρογχία: *Acut.* 5, *Carn.* 16.

139 Only in *Loc. Hom.* 1, 3, 20. The author here makes an explicit distinction between the esophagus (οἰσοφάγος) and trachea (βρόγχος). Craik 1998a *ad loc.*, however, cites problems in the transmission of the word in the manuscripts as evidence that the word might be a later interpolation.

140 E.g. *Aph.* 4.82; *Int.* 14; *Mul.* 9.

141 E.g. *Int.* 14 (pain in the οὐρήθρη); *Aph.* 6.37 and *Morb.* 2.28 (pain in the βρόγχος); *Int.* 1 (pain in the ἄρτηρίη); *Morb.* 2.54 (ruptures of the ἄορτρα).

142 E.g. *Loc. Hom.* 20: ρεῦμα πολὺ ὁπότεν διὰ τοῦ οἰσοφάγου ἐς τὴν κοιλίην ρεύση, ἴνησις γίνεται κάτω, ἔστι δ’ ὅτε καὶ ἄνω· τούτῳ ἦν μὲν ὁδύνη ἐνῆ ἐν τῇ γαστρὶ, ὑπεξάγειν πρῶτον φαρμάκῳ ἢ χυλῶ, ἔπειτα φαρμάκῳ ἰσχητηρίῳ χρῆσθαι, τοῖσι δὲ σιτίοισι διαχωρητικοῖσιν ἕως ἂν ἡ ὁδύνη ἔχη· ‘When much flux travels through the esophagus to the belly, there is a lower disturbance when it also happens above. If the pain travels into the stomach, first administer drugs or a draught, then use stronger drugs and foods with laxative properties until the pain stops.’

143 But cf. descriptions of κιρσοί (varicose veins), e.g. *Aph.* 6.34; *Coac.* 502; *Art.* 41.

144 The fullest account of the vascular system in the Hippocratic Corpus remains Harris 1973: 29-96. See also Craik 2009a for a concise discussion.

the circulatory system was imperfect and often incorrect, they still identified and labelled specific types of veins within the body. These labels were sufficient for the needs of physicians, and since they accurately represent the vessels, little fault can be found with them. Three terms were used because of the size or appearance of certain vessels:

- 11) κοῖλαι φλέβες (*hollow veins*)¹⁴⁵
- 12) μεγάλοι φλέβες (*large veins*, a synonym for κοῖλαι φλέβες)¹⁴⁶
- 13) φλεβία (*small veins*)¹⁴⁷

Four adjectives to identify the locations or (presumed) origins of specific vessels also appear for the first time in the HC (*sc.* φλέψ for each):

- 14) ἥπατιτις (*hepatic vein*)¹⁴⁸
- 15) σπληνίτης (*splenic vein*)¹⁴⁹
- 16) σφαγίτιδες (veins of the throat, probably both the carotid arteries and jugular)¹⁵⁰
- 17) ὠμιαῖα (*shoulder vessels*, the axillary vein and artery)¹⁵¹

The terms ἥπατιτις and σπληνίτης suggest a particular specialization of medical vocabulary.

In classical Greek, including that of the Hippocratic Corpus, the termination -ιτις is generally

145 Although sometimes referring to the vena cava (e.g. *Morb. Sacr.* 3; *Loc. Hom.* 3), the term most often denoted any large vessel, e.g. *VC* 2 (the superficial temporal vein, i.e. the veins on the temple [κροτάφος]), and *Carn.* 5 (referring to both the pulmonary artery and vein). For the appearance of the term outside of the HC, see *Pl. Ti.* 78b3 and 80d4; *E. Ion* 1011. Since Euripides has also used the term, Craik 1998a: 111 calls it ‘semi-technical.’ Other than these instances, κοῖλαι φλέβες is not used elsewhere before Aristotle, e.g. *HA* 497a14.

146 *Epid.* 2.5.6, 6.7.2; *Morb.* 1.18; *Coac.* 425. The term does not appear elsewhere before Aristotle, e.g. *GA* 745b31. On the term as a synonym for κοῖλαι φλέβες, see Harris 1973: 36.

147 E.g. *Int.* 5; *Carn.* 7 (probably the capillaries of the lungs, not the alveoli, cf. *Morb.* 1.10: κοιλίη... ἐν τῷ πλεύμονι); *Int.* 16 (the peritubular capillaries, i.e. those alongside the kidneys [νεφροί]); *Fract.* 11 (vessels in the heel [πτέρνη]); *Loc. Hom.* 2 (the retinal veins, i.e. of the eyes [ὀφθαλμοί]). Outside of the HC, the word only appears at *Pl. Ti.* 65c7 and 84e6 before Aristotle (e.g. *de An.* 422a3).

148 *Epid.* 2.4.1; *Morb.* 1.26 and 28.

149 *Aph.* 20; *Morb.* 1.26 and 28.

150 *Loc. Hom.* 11 (σφαγίτιδες); *Acut.* 6 (τὰς σφαγίτιδας φλέβας); *Flat.* 14 (τῶν σφαγιτίδων φλεβῶν); *Coac.* 256 (φλεβῶν σφαγιτίδων). The term is derived from σφαγή (*slaughter*), because these are the vessels of the sacrificial animal that would have been severed. (See Burkert 1985: 65-67 for a normative description of a Greek blood sacrifice, in which an animal is killed by slicing its throat. See further van Straten 2006: 19-21.) Aristotle at *HA* 512b quotes the use of the term in *Loc. Hom.*, and comments that the work was written by Hippocrates’ son-in-law Polybus. (For a short discussion of Aristotle’s citation of Polybus, see Langholf 2004: 252; for Polybus’ relationship with Hippocrates and his theories, see Nutton 2004: 84-85; Jouanna 1999: 48; and von Staden 1976.) Galen at *Plac. Hp. et Pl.* 2.6.5 K appears to differentiate between the σφαγίτιδες φλέβαι and the καρωτίδαι ἀρτηρίαι (‘carotid arteries’). It is unclear whether Hippocratic authors were aware of any distinction.

151 *Loc. Hom.* 3.

used to construct the adjectival form of a noun. The term σπληνίτης therefore means ‘of or due to the spleen’ (LSJ, *s.v.*), and is often used in a pathological sense for a sickness of the organ.¹⁵² As adjectives, the terms ἥπατις and σπληνίτης (of/due to the liver and spleen) strictly speaking do not belong to our list of anatomical parts or structures. There are, however, instances in the HC where these terms appear to be approaching the status of adjectival nouns when Hippocratic authors use these terms as shorthand to describe specific structures within the body.

Since both the ἥπατις and σπληνίτης as adjectives can refer to both diseases and parts of the body, there is the possibility for some ambiguity in the text. For example, the terms are used in both senses in *Diseases 1*, a larger Hippocratic work that advises how to be a competent physician and how to recognize and treat specific diseases. These instances show that it was important for the reader to understand the context of a term in order to grasp its meaning. At section 3 the author mentions both the ἥπατις and the σπληνίτης in a lengthy list of diseases. Later in section 28 he (incorrectly) traces the ‘so-called splenic vein’ (ἡ φλέψ ἡ σπληνίτης καλομένη) to the left arm. Next, he traces the hepatic vein (ἡ ἥπατις) to the right arm without any mention of φλέψ, apparently because he assumes that the reader will know from the context that he is referring to a vein.¹⁵³

The term ἥπατις as a type of vessel appears more often than σπληνίτης in the HC, which perhaps suggests that physicians were either more concerned with or more aware of this vessel.¹⁵⁴ The author of *Epidemics 2.4*, who was particularly interested in tracing the hepatic

152 E.g. *Int. 27 et passim*, *Morb.* 1.3. In today’s medical parlance, the suffix -(i)tis denotes the pathological inflammation of a specific body part (Scarborough 1992: 96). For example, according to the *OED splenitis* is the ‘Inflammation of the spleen, or a particular form of this.’

153 For another instance of the adjective where the vessel (φλέψ) is assumed, see *Morb.* 1.28: τὴν σπληνίτιν καλομένην; *Aff.* 20. Aristotle at *HA* 512a notes that physicians bled the splenic and hepatic vessels in the arms whenever there was pain in the belly.

154 It is very likely that some of this interest in the human liver and its parts is related to the practice of hepatoscopy in sacrificial animals. See Collins 2008 for a full discussion of the practice in classical Greece.

vessel, uses only the adjectival form (ἥπατιτις) without any explicit reference to it being a vein (φλέψ). The author of *Epidemics* 6 in a short note describes his observations of blood that has stopped in the veins (6.7.2): Ἐβουβωνούτο τὰ πλεῖστα, διότι ἥπατιτις· ([patients with this condition] suffered from *buboes* [swollen lymph nodes] the greatest, because of the hepatic [vessel]). The author's elliptical style in this section suggests that it was originally a private note; he provides only enough words for him to understand what is meant.¹⁵⁵ It is therefore notable that he does not use the term φλέψ, or *vessel*, when using the adjective ἥπατιτις.¹⁵⁶ The context gives him sufficient information to ensure that he does not mistake the meaning of the word.

3.4. Awareness of technical vocabulary: the use of the verb καλεῖν

The lack of fixed, clear, definitions for anatomical terms as well as new coinages increased the chances of ambiguity in the text. However, there is internal evidence within the HC to suggest that medical writers were aware of these potential problems of their vocabulary and that they sometimes attempted to inform the reader when they were using a word outside of its normal sense. Among the evidence for this are general comments about medical vocabulary and verbal cues (most importantly, forms of καλεῖν ‘to name’/‘to call’) that highlight a word's special meaning.

Precepts, likely a later Hellenistic or possibly a Roman work that describes an ideal physician,¹⁵⁷ contains a good example of a physician's awareness of his craft's proprietary vocabulary. Although the passage is corrupt, it appears that the author advises ‘late learners’ of

155 For example, he alludes to a previous case involving a patient from Posidonia: ἦν δὲ καὶ ἀπὸ ἀρτηρίας κακωθείσης κακὸν σημεῖον, οἷως Ποσειδωνίη. ‘There was a bad sign from the deteriorated trachea, as was the case in Posidonia.’

156 See Ruf. *Onom.* 199 for the place of this term in the development of vascular terminology.

157 For the dating of *Precepts* see Jouanna 1999: 405-6. Although it is probably not classical, the author's sentiments reflect those we see in earlier Hippocratic writings.

medicine against – or rather criticizes them for – using ‘metaphors’ (μεταφοράί, i.e. extended meanings for words) in clinical situations that are likely to confuse their audience (13):¹⁵⁸

Εὐκτέῃ δὲ καὶ διάθεσις ἔκτος ἑοῦσα ὀψιμαθίης·...ὀρισμοῖς τε καὶ ἐπαγγελίῃσιν ὄρκοις τε παμμεγέθεσι, θεῶν εἴνεκεν, ἰητροῦ προστατέοντος νόσου, ἀναγνώσιος ξυνεχίης, κατηχήσιός τε ἰδιωτέων φιλαλυστέων λόγους ἐκ μεταφορῆς διαζηλευομένου, καὶ πρὶν ἢ νοῦσῳ καταπορέωσιν ἠθροισμένοι.

A condition too is desirable free from the late-learner’s faults...definitions, professions, oaths, great as far as the gods are concerned, come from the physician [i.e. the late learner] in charge of the disease, bewildered laymen being lost in admiration of metaphorical language spoken in continuous reading and instruction, crowding together even before they are troubled by a disease.

Hippocratic writers generally avoided jargon for parts of the body when a common word would suffice. When an author wanted to describe the eye, he used the common vernacular ὀφθαλμός;¹⁵⁹ when he wanted to mention the genitals of both sexes, he regularly used the common euphemism αἰδοῖα.¹⁶⁰ There was not need to invent words when preexisting ones would suffice.

Sometimes Hippocratic writers suggest that these basic anatomical terms could be unclear. The author of *Sacred Disease* (17) provides insight into this self-conscious use of anatomical vocabulary in his argument for the brain (ἐγκέφαλος) as the centre of thought. This work, whose composition date can only be dated as precisely as sometime during the second half of the 5th century, is our earliest articulation of the organ’s mental function, although the idea seems to have been proposed earlier by the natural philosopher Alcmaeon of Croton (6th - 5th century BCE).¹⁶¹ This theory went against the general public view (already evident in the

158 Tr. Jones 1923a: 329 with modifications. For a similar assessment of medical ‘gibberish’ being used, see *VM* 15. The author here is doubting a patient’s understanding of medical properties such as ‘hotness,’ and argues that the physician must talk ‘foolishly’ in his explanation (Ἐπεὶ ἐκεῖνό γε ἄπορον προστάξει τῷ κάμνοντι, θερμόν τι προσενέγκασθαι· εὐθύς γὰρ ἐρωτήσει, τί ἐστίν; ὥστε ληρέειν ἀνάγκη).

159 E.g. *Aph.* 7.74; *Loc. Hom.* 13.

160 E.g. *Epid.* 3.3.7; *Mul.* 34.

161 See Jouanna 1996: 82 for this dating of *Morb. Sacr.* Aetius remarks that Alcmaeon believed that the brain was the centre of thought (4.17.1 = fr. 8 DK). See also Theophrastus *de Sens.* 25f = fr. 5 DK for his comments on Alcmaeon’s connection between the brain and smell. See Lloyd 1975b for further discussion.

Homeric epics) that the φρένες (*diaphragm*, or more broadly *chest*) were the centre of mental activity.¹⁶²

The author of *Airs, Waters, Places* finds it absurd that by accident and general custom the φρένες (*diaphragm*, as he understands the word) have instead been associated with the location of the intellect. He uses two anatomical observations to reject this view: 1) the diaphragm is too thin to be the source of thought; and 2) it has no cavity to receive anything (presumably, the centre of thought must be able to collect material). In what follows, he explains that the anatomical term φρένες was mistakenly formed from the verb φρονεῖν ('to think').¹⁶³ As proof for the risk of drawing conclusions about the function of a part from its name, he describes language for the heart:

ἐπεὶ αἰσθάνονται γε οὐδενὸς πρότερον τῶν ἐν τῷ σώματι ἑόντων, ἀλλὰ μάτην τοῦτο τὸ οὐνομα ἔχουσι καὶ τὴν αἰτίην, ὥσπερ τὰ πρὸς τῇ καρδίῃ ἄπερ ὠτα καλέεται, οὐδὲν ἐς τὴν ἀκοὴν ξυμβαλλόμενα.

Since [the diaphragm] is unable to perceive any more than any other parts of the body, there is no reason for it to have this name [i.e. 'the place of thinking'] and function [i.e. 'thought'], just like there are things attached to the heart called 'ears,' although they play no function in hearing.

By 'ears,' the author is referring to the right and left arterial appendage of the heart, which resemble ears.¹⁶⁴ Although this is the first occurrence of ὠτα (*ears*) with this meaning, both the context and its use in later medical writings suggests that the author was not inventing the term and that he was sensitive to the potential problems of someone reading too much into

162 For a full discussion of φρένες as a seat of intellectual activity in the Homeric poems (e.g. *Il.* 4.163, 6.481, 16.842; *Od.* 1.42, 8.541) see Sullivan 1988, esp. 37-70; see also Snell 1977. Dodds 1951: 179 correctly comments that the classical Greeks inherited several inconsistent models for the intellect that are represented in the Homeric poems (we may include φρένες among these). For representative examples from the Classical period of φρένες as a centre for psychological activity, see *A. Ag.* 983; *S. Aj.* 585; *E. Tr.* 417; *Ar. Th.* 291; *Hdt.* 2.151.10; *Pl. Tht.* 154d9; *D. In Arist.* 33.

163 We, however, understand that the verb is derived from the noun (Frisk and Chantraine, s.v. φρήν).

164 In modern Western medicine, they are also called the 'auricles' (lit. 'little ears'), derived from the Latin translation of the Greek.

metaphorical language.¹⁶⁵ The author hints at the special meaning of the term ὦτα when he pairs it with καλέεταί ('they [i.e. *arterial appendages*] are called').

The verb καλεῖν is often used in both Hippocratic and other prose writings to mark a technical word.¹⁶⁶ In this context, it can be applied to a recently coined term or to a common word applied outside of its normal meaning. In either case, the author is concerned whether the audience will know the term or be familiar with its meaning. For example, Isocrates refers to 'so-called philosophy' when mentioning the newfangled pursuit among the Athenian elite (*Antidosis* 270): τὴν καλουμένην ὑπὸ τινῶν φιλοσοφίαν, 'the so-called "love of knowledge" [i.e. *philosophy*].' Aristotle describes the ἐν τῷ ἀέρι τὰ καλούμενα ξύσματα, or 'the so-called "shavings" in the air' (*The Soul* 404a), by which he means the visible particles suspended within a sunbeam. Appearances of καλεῖν in Aristotle are most relevant to appearances in medical writings, since both usually rely upon an understood analogy between the normal meaning of a term and its new application.¹⁶⁷ Although he does not explicitly mention καλεῖν, Longinus tells us that both Aristotle and Theophrastus used similar vocabulary to mark unusual terms.¹⁶⁸ These qualifiers are restricted to apologies for metaphor: ὡςπερεὶ ('as for instance'),¹⁶⁹ οἷονεὶ ('as

165 E.g. Hp. *Cord.* 8; Rufus *Onom.* 162; Gal. *Anat. Admin.* 2.609 K.

166 Dover 1997: 115. Lloyd 1983: 154-55 cautions against drawing conclusions that the collocation of a term with some form of the verb καλεῖν confirms it as a technical term. For contrary evidence he cites the early precedent from the Homeric epics, *Il.* 5.306 in reference to the hip-socket (κοτύλην δέ τέ μιν καλέουσι, 'they call it the *cup*'); as well as the expression in non-technical writing, for example θώραξ (lit. breastplate) at Pl. *Ti.* 69e6 to mean 'torso.' (I argue for the technicality of this word later in chapter 5.) Although Lloyd's warning is valid, the appearance of some inflections of καλεῖν is a good indication that a term is being used in a technical sense. In each of these examples the author is conscious of potential ambiguity. This ambiguity greatly increases in the burgeoning scientific writings in the Classical period, and we therefore see it most often in newly-coined words.

167 For further examples, he describes the 'so-called "spur" of the ankle,' (τὰ καλούμενα πλῆκτρα ἐν τοῖς ἔχουσι σφυρόν) referring to the heel or calcaneus bone in our foot, based on analogy with a cock-spur (*HA* 516b2); elsewhere, he discusses the 'so-called "bride"' (αἱ καλούμεναι νύμφαι) in reference to the pupal stages of an insect, presumably because it is at the cusp of becoming what it is intended to be (*GA* 755b33).

168 Longin. 32.2-4. He explains that they did this in order 'to cure the daring [*sc.* metaphorical] expressions' (ἰᾶται τὰ τολμηρά).

169 E.g. Arist. *HA* 530a21, *PA* 687a21; Thphr. *HP* 5.4.9, *CP* 2.16.5.

if”);¹⁷⁰ εἰ χρὴ τοῦτον εἰπεῖν τὸν τρόπον (‘if it is necessary to speak this way’).¹⁷¹ It appears that καλεῖν functions on a similar level for the audience, in the sense that it signposts the strange (and often metaphorical) use of the word.

The HC contains many examples of this use of the verb καλεῖν, where it is an especially common qualifier for names of sicknesses.¹⁷² Hippocratic authors write about conditions such as the τὰ παχέα καλούμενα νοσήματα (‘so-called “thick” diseases’; *Int.* 47); the νοῦσος ἢ καλουμένη λήθαργος (the ‘so-called “secretly biting” disease’;¹⁷³ *Morb.* 2.65); and ἡ ἱερὴ καλομένη (‘the ‘so-called “sacred” one [*sc.* disease]’ *Morb. Sacr.* 18¹⁷⁴). Each of these labels are formed from an adjective – ‘thick,’ ‘secretly-biting,’ and ‘sacred’ – that when paired with the term ‘disease’ denotes a special identified type of sickness. By qualifying the terms by adding ‘so-called,’ the author is both denoting the term’s special meaning and perhaps subtly apologizing for its strangeness.¹⁷⁵

170 E.g. Arist. *HA* 495b25, 529a11; Thphr. *de Pietate* fr. 2.8, *CP* 3.20.1.

171 The exact phrase is not in any surviving texts, but the similar expression ὡς εἰπεῖν (‘so to speak’) appears often, e.g. Arist. *HA* 602a15, *de An.* 408a1; Thphr. *HP* 7.1.5, *CP* 6.6.4.

172 There are over 50 occurrences of καλεῖν used in the HC to define a disease. For other examples, see *Prog.* 23 σταφυλή (‘grape bunch,’ to describe a swollen uvula); *Epid.* 3.3.7, 6.8.3 σήψ (‘putrefying sore,’ from σήπειν, ‘to make rotten’); *VC* 7 ἔδρη (‘seat,’ a type of injury to the skull); *Prorrh.* 2.32 νυκτάλωπες (someone suffering from night-blindness, *Prorrh.* 2.42); μελικηρίς (cyst resembling a honeycomb); *Prorrh.* 2.43 ἡ νοῦσος ἢ φοινικίη (‘the purple disease’); *Nat. Hom.* 12 πύον (discharge from a sore); *Nat. Hom.* 15 ξύνοχος (‘joined together,’ i.e. [of fevers] continuous/unbroken); *Flat.* 10 βράγχος (sore throat); *Morb.* 2.48 φθόη (empyema); *Aff.* 19 ἡ νοῦσος φλέγμα λευκόν (‘white phlegm sickness’); *Loc. Hom.* 46 τὰ γυναικεία νοσεύματα (‘women’s sicknesses,’ which all arise from their wombs); *Int.* 43 εἰλεοί (internal blockages; cf. 45 καλέεται..εἰλεός ἰκτερώδης, ‘jaundice’).

173 See also κυνάγχη, or ‘dog-choking,’ which the author of *Morb.* 3.10 describes as ‘so-called,’ since one suffering from it feels as if his windpipe is tangled (like he was wearing a dog choker): Κυνάγχη ὑπὸ δὲ τῆς κυνάγχης καλομένης πνίγεται ὠνθρωπος, καὶ ἐν τῇ φάρυγγι μᾶλλον οἱ δοκέει ἐνέχεσθαι. The LSJ offers the translation ‘dog-quinsy.’ Quinsy is an inflammation of the throat, often caused by an abscess on or near the tonsils.

174 For examples of the same phrase in the HC see also *Aër.* 4; *Prorrh.* 2.9; *Mul.* 151,

175 For other uses of καλεῖν in addition to disease or anatomical terms, see *Flat.* 3: φύσαι (internal ‘gasses,’ which the author contrasts with ἀήρ [‘air’] outside of the body); *VM* 19: χολῆ ξανθῆ (‘yellow bile’); *Nat. Hom.* 7: μέλαινα (‘black [*sc.* bile]’); *Int.* 20: λευκὸν τὸ φλέγμα (‘white phlegm’); *Nat. Hom.* 47: καταμηνία (‘menstruation’); *Art.* 12: γαλιάγκων (a person with short arms, lit. ‘weasel-armed’). See also *Pl. R.* 405c8-d4 for a polemical attack on new diseases and physicians names for them: ‘And doesn’t it seem shameful to you to need medical help, not for wounds or because of some seasonal illness, but because, through idleness...one is full of gas and phlegm like a stagnant swamp, so that sophisticated Asclepiad doctors are forced to come up with names like “flatulence” [φύσαι] and “catarrh” [κατάρροι] to describe one’s diseases?’

Inflections of καλεῖν are used to note 33 anatomical terms in the HC (Table 3.1). Four exceptional cases do not mark technical terms. In these instances the verb is used to emphasize the labelling of a common anatomical part for a special reason, such as to correct improper terminology or to call attention to the process of term-creation.¹⁷⁶ But in most instances when καλεῖν is used, the author seems to be concerned about the clarity of a term.¹⁷⁷ He therefore includes καλεῖν as a cue for his readers either that an uncommon word is used or that they should avoid interpreting the word in its normal sense.

Table 3.1: Uses of καλεῖν in the HC

Term	Common meaning/original term	Meaning in work	Location
ἄγκών	-	elbow ¹⁷⁸	<i>Fract.</i> 3
ἀντικνήμιος	the front part of the κνήμη (calf)	shin bone (tibia)	<i>Fract.</i> 18
ἀστραγάλος	joint ¹⁷⁹	ball of the ankle joint	<i>Epid.</i> 5.48
θώραξ	breastplate	thorax	<i>de Arte</i> 10
ἰσχίον	-	hip-joint ¹⁸⁰	<i>Loc. Hom.</i> 6
καρδίη	-	heart ¹⁸¹	<i>Morb.</i> 4.36
κοιλίη	κοῖλος (hollow)	stomach, as opposed to the more common meaning 'paunch' or the superficial 'belly.' ¹⁸²	<i>Vict.</i> 9
κιονίς	κίων (pillar)	uvula	<i>Acut.</i> 6
κόρη	girl ¹⁸³	pupil	<i>Carn.</i> 17
κοτύλαι	cups	hip-sockets	<i>Loc. Hom.</i> 6

176 *Fract.* 3: ἄγκών; *Vict.* 9: κοιλίη, σάρκες; *Morb.* 4.36: καρδίη.

177 As Craik 1998a: 19 writes on the use of the word in *Places in Humans*: 'Technical terms are used, sometimes with a belated explanation as "so called" [καλεῖσθαι], as if for a specialist but less knowledgeable reader.'

178 In this passage he is emphasizing that the 'so-called elbow,' which we lean on, is part of the humerus bone (which he calls the βραχίων, the general term for the upper arm), and not the ulna bone (πῆχυς) as some of his fellow practitioners think: ἔστι δ' ἐκείνω τῷ ὀστέῳ τῷ τὸ ἄγκών καλεόμενος, ᾧ ποτὶ στηριζόμεθα.

179 The term is used to refer to several types of joints: *vertebra*, e.g. *Il.* 14.466; *knuckle bone* (this part of an animal was commonly used as dice), e.g. *Il.* 23.88, *Pherec. fr.* 43, *Pl. Thet.* 154c. For the term's meaning of 'ball of ankle joint' outside of the HC, see *Hdt.* 3.129 and *X. Eq.* 11.4 (both of horses).

180 He is likely differentiating the meaning of internal hip-joint from the external haunches (e.g. of a human *Il.* 8.340, and of horses, *Hdt.* 6.75, *X. Eq.* 7.7).

181 The author here is commenting on the proper use of the term. See below for discussion.

182 Here and elsewhere in this passage the author is not concerned with terminology but with the formation of body parts, to which he writes the Greeks gave the names κοιλίη (*stomach*), φλέβες κοιλια (*hollow veins*), and σάρκες (*flesh*).

Term	Common meaning/original term	Meaning in work	Location
μῦς	mouse/rodent	muscle (specifically of the thigh)	<i>de Arte</i> 10
μῦες κροταφῖται	κρόταφος (temple)	temple muscles	<i>Art.</i> 30
μῦες μασσητήρες	μαστάζειν (to chew)	jaw muscles	<i>Art.</i> 30
ὀδούς	tooth	spinal dens ¹⁸⁴	<i>Epid.</i> 2.2.24
ὀστέον ἱερόν	ἱερός (sacred) ¹⁸⁵	sacrum	<i>Art.</i> 47
τὸ ὀστέον ἢ κνήμη	κνήμη (lower leg, below the knee to the ankle)	tibia ¹⁸⁶	<i>Loc. Hom.</i> 6
ὄσχοι	ὄχεύς (fastener)	female peritoneal ligaments (?) ¹⁸⁷	<i>Mul.</i> 204
παρίσθια	lit. ‘from the ἴσθμιον’ (‘fauces,’ the passage between the mouth and the pharynx)	tonsils	<i>Gland.</i> 7
περόνη	pin	small bone of the arm, radius	<i>Loc. Hom.</i> 6
πλίχας	πλίσσεσθαι (to cross the legs)	perineum	<i>Art.</i> 54, <i>Fract.</i> 20
σάρκες	-	flesh	<i>Vict.</i> 9
σπόγγοι	sponges	neck glands	<i>Epid.</i> 4.7
σφάγια	σφαγή (‘slaughter,’ hence ‘throat’)	neck vessels	<i>Morb.</i> 4.38
σφαγίτιδες	see σφαγή above	see above	<i>Nat. Hom.</i> 11
σωφρονιστήρες	σωφρονεῖν (‘to be of sound mind,’ i.e. wise)	wisdom teeth	<i>Carn.</i> 13

183 The reason for the use of κόρη to mean ‘pupil’ is explained by Plato (*Alc.* 1.133a): (ΣΩ) Ἐννερόκας οὖν ὅτι τοῦ ἐμβλέποντος εἰς τὸν ὀφθαλμὸν τὸ πρόσωπον ἐμφαίνεται ἐν τῇ τοῦ καταντικρῦ ὄψει ὡς περ ἐν κατόπτρῳ, ὃ δὴ καὶ κόρην καλοῦμεν, εἶδωλον ὃν τι τοῦ ἐμβλέποντος; [Soc.] ‘I’m sure you’ve noticed that when a man looks into an eye his face appears in it, like a mirror. We call this the “pupil,” for it’s a sort of miniature of the man who’s looking.’ Our term ‘pupil’ shares the same Latin etymology (L. *pupilla* ~ ‘little girl’; *OED s.v.*).

184 An extrusion of bone on the vertebra where the spine meets the skull (*Fig.* 3.4 below).

185 It is a mystery why the term ‘sacred’ has been attached to this bone. Sugar 1987 suggests that the concept originated in Egypt, where it was associated with resurrection. Gordon 2004: 120-23 explains that the sacrum was identified with strength (since the five vertebrae here are fused). The term for backbone (*djed*) was used both in descriptions of righting pillars (in one case perhaps symbolically representing the backbone of Osiris) and setting mummies upright as part of the embalming ritual. The possibility remains, however, that the Greek and Roman terms, ἱερόν ὀστέον and *os sacrum*, originated from the importance of the bone in animal sacrifice (*ibid.* 124-25). Scarborough 1992: 128-29 suggests that the term may have been coined because the curvature of the sacrum is similar to that of a sacrificial knife. This is the first appearance of the term in Greek. For later examples see Plut. 2.981d and Galen *UP* 5.8 K.

186 The author here is distinguishing between the lower leg (κνήμη) and its bone, the tibia.

187 τὰ νεῦρα [τῆς ὑστέρης] τὰ καλούμενα ὄσχοι (‘the sinews [of the uterus], the so-called *fasteners*’), cf. LSJ *s.v.* ὄχος.

Term	Common meaning/original term	Meaning in work	Location
ταρσός	frame of wicker-work	tarsal bones (of foot)	<i>Fract.</i> 9
φλέψ ἥπατῆτις	ἥπαρ (liver)	hepatic vein	<i>Morb.</i> 1.28
φλέβες κοίλια	κοίλια (hollow)	hollow vessels	<i>Vict.</i> 9, <i>Loc. Hom.</i> 3, <i>Morb. Sacr.</i> 3
φλέψ σπληνίτις	σπλήν (spleen)	splenic vein	<i>Morb.</i> 1.26, 28
φλέβες ὠμιαῖαι	ὠμος (shoulder)	axillary artery and vein ¹⁸⁸	<i>Loc. Hom.</i> 3
χιτῶν	garment	membrane (specifically of the eye)	<i>Carn.</i> 17 ¹⁸⁹
ψόαι	-	loin muscles (the psoas)	<i>Art.</i> 45
ὠτα	ears	auricles of the heart ¹⁹⁰	<i>Morb. Sacr.</i> 17

A good example of an author's concern over clarity of a term's meaning is found at *Joints* 30, where the physician describes οἱ μύες οἱ κροταφῖται καὶ μασσητῆρες καλεόμενοι ('the so-called "temple" and "chewing" muscles').¹⁹¹ Both terms are used only here in the Classical period and not again in extant works until the 1st century CE.¹⁹² The author seems to be aware that his vocabulary was uncommon, since he is careful to explain the reasons for his word-choice:

διὰ τοῦτο δὲ καλέονται, καὶ διὰ τοῦτο κινέονται, ὅτι ἐντεῦθεν ἐξήρτηνται· ἐν γὰρ τῇ ἐδωδῇ, καὶ ἐν τῇ διαλέκτῳ, καὶ ἐν τῇ ἄλλῃ χρήσει τοῦ στόματος, ἡ μὲν ἄνω γνάθος ἀτρεμέει·

They are named and move this way, because of the location of their attachment [i.e. the lower jaw]; for in eating, in speech, and in other uses of the mouth, the upper jaw does not move.

188 δύο φλέβες ἀπὸ τῆς κορυφῆς φέρονται ἐς τοὺς ὠμούς, καὶ δὴ καὶ ὠμιαῖαι καλέονται. 'two vessels run from the top of the head to the shoulders, and hence are called the shoulder vessels.' (following Craik 1998b: 41).

189 The term is used elsewhere in the HC unapologetically in its anatomical sense. See for examples *Coac.* 275, *VM* 19, *Morb.* 1.17, and *Aph.* 7.45.

190 Ear-shaped appendages to both atria of the heart. See p. 106 above.

191 *de Arte* 10 couches the term μῦς ('muscle') in a similar fashion: τῶν μελέων...σάρκα περιφερέα, ἣν μὴν καλέουσι ('the flesh surrounding the limbs, which they [i.e. medical specialists] call "muscle"').

192 κροταφῖται: Rufus *Onom.* 142; Gal. *UP* 3.738 K; μασσητῆρες: Gal. *Anat. Admin.* 2.439 K. In his commentary to the work, Galen remarks that he is unclear whether these terms represent two muscle groups or one muscle group with two alternative names (18.429 K).

He wants his reader to know three things in this passage: 1) there are two muscle groups associated with the jaw, which have special names: the κροταφίται and the μασσητήρες; 2) the terms are derived from what they do (μαστάζειν, ‘to chew’) and where they are located (κροταφοί, ‘temples’), which makes the terminology correct; and 3) the language used for these parts can be useful for understanding them.

Most Hippocratic authors do not explain why a specific technical term is being used, but rather only imply its special meaning by pairing it with καλεῖν. For example, the author of *Epidemics* (2.2.24) when describing an injury to the spine locates pain at the ‘so-called “tooth”’ (τοῦ ὀδόντος καλεομένου, see *Fig. 3.4* and *3.5*).¹⁹³ The primary meaning of the word is simply ‘tooth’ (of the mouth), although the author of this clinical note is using it in a very specific sense to mean the extrusion of bone on the spine where the neck meets the body.¹⁹⁴ What is most notable about the use of this word here is that it appears without any additional qualification other than its context and the adjectival καλεομένος. When the author mentions ‘tooth’ in context with the spinal column, with the addition of ‘so-called,’ he is pointing out that he is using the term outside of its normal sense.¹⁹⁵

193 Ἦν δὲ τῶν κυναγχικῶν τὰ παθήματα τάδε· τοῦ τραχήλου οἱ σπόνδυλοι ἔσω ἔρρεπον, τοῖσι μὲν ἐπὶ πλέον, τοῖσι δ’ ἐπ’ ἔλασσον· καὶ ἔξωθεν ἦν δηλὸς ἔγκοilon ἔχων ὁ τράχηλος· καὶ ἦλγεε ταύτη ψαυόμενος· ἦν δὲ καὶ κατωτέρω τινὶ τοῦ ὀδόντος καλεομένου, ὃ οὐχ ὁμοίως ὄξύ ἐστιν·

194 In modern medical terminology this bony outcropping is still called the Greek-derived ‘odontoid process’ or by the Latin translation ‘dens.’

195 In fact, only a few words later the author repeats the phrase (τῷ ὀδόντι καλεομένῳ) when describing the bone’s relation to the pharynx (φάρυγξ), thereby acknowledging his special use of this term. For a similar assessment of θώραξ καλεόμενος in *de Arte* 10 see Lloyd 1983: 155.

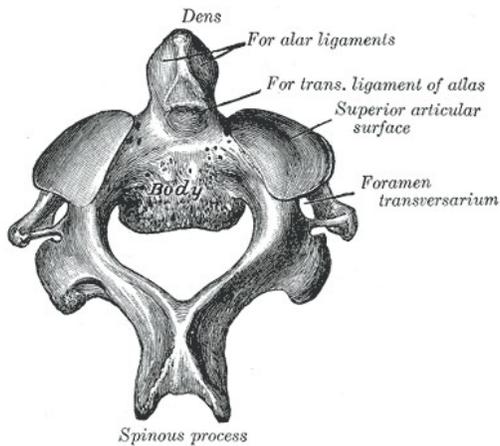


Fig. 3.4: The 'dens' or 'odontoid process.'
(Gray's Anatomy 1918, fig. 87)



Fig. 3.5: The odontoid process *in situ*
(Gray's Anatomy 1918, fig. 111, modified)

These examples suggest that the intended reader would recognize this special use of the term and then apply it to the same anatomical part as the author intends. This further implies that the reader knows about the spinal 'dens.' Someone unfamiliar with this part of the body would probably have been rather confused about the meaning of the term in this context. It would appear that the author of *Epidemics 3* expected that his readership would be familiar with his vocabulary, and therefore were medical specialists.

One final example of a term qualified by *καλεῖν* is worth closer investigation, since it shows an unusual concern with proper terminology (*Morb.* 4.36):

ἐπὴν φάγη καὶ πῖη ὁ ἄνθρωπος ὅ τι ἐστὶ πικρὸν ἢ ἄλλως χολῶδες καὶ κούφον,
καὶ πλείων ἢ χολὴ γίνηται ἐπὶ τῷ ἥπατι, αὐτίκα ἀλγέει τὸ ἥπαρ, ὅπερ οἱ παῖδες
καρδίην καλέουσι.

When a man eats or drinks something bitter, or in general anything which is bilious and light, the bile increases, and the liver – the “heart” as children call it – immediately suffer pain.

We see here an explanation for gastroesophageal reflux (i.e. in lay-speech ‘heartburn’). The author’s claim that children (παῖδες) call the liver (ἥπαρ) the heart (καρδίη) is particularly important. He is almost certainly referring to the ailment known as καρδιαγία (‘heart-pain,’ i.e. ‘heartburn’).¹⁹⁶ The comment appears to be a negative appraisal of careless use of terminology: only children are so ignorant as to confuse ἥπαρ with the καρδίη. Yet the term καρδιαγία is common enough in the HC that we can safely assess it is not strictly children who used this term.¹⁹⁷

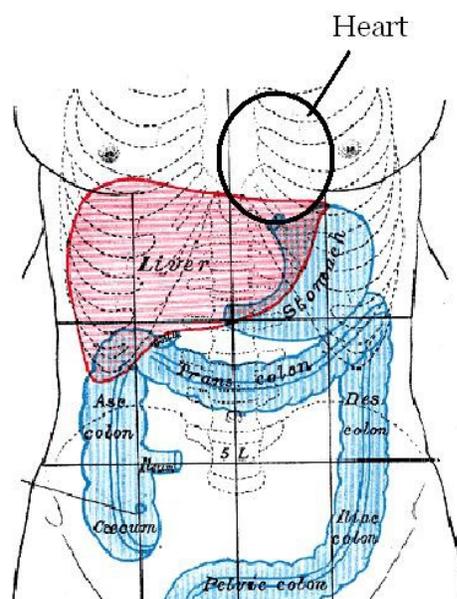


Fig. 3.6: Relational position of liver, stomach, and heart
(Gray's Anatomy 1918, fig. 1223, modified)

The author here is arguing for exactitude of terminology. Unlike the *Epidemics*, which are primarily concerned with recording symptoms, *Diseases 4* is focused upon identifying the cause of the disorder. This requires proper identification and labelling of the parts involved. A common awareness that the heart is located somewhere in the upper chest – if from its palpitation alone – would have given the average person enough reason to refer to his or her

¹⁹⁶ See *Morb.* 4.54 for the author’s extended discussion about the liver (ἥπαρ) as the cause of καρδιαγία.

¹⁹⁷ See for examples *Epid.* 2.1.3, 4.1.16, 7.1.16; *Coac.* 67, 279 (and 280 for καρδίης ἄλγημα); *Prorrh.* 1.106, 139.

gastroesophageal reflux as originating from the organ. The term καρδιαλγία, like our ‘heartburn,’ was therefore pragmatically specific enough to identify the condition. However, the author of *Diseases 4* is not concerned with how practical the labels of the internal parts are, but rather with their accuracy. Because he wants to understand the material causes of disease properly, he insists upon correct terminology, even when it might conflict with common usage.

3.5. Conclusions

Preexisting anatomical words that appear in the Homeric poems provided the Hippocratics with a solid foundation to describe their medical body, yet these words were insufficient to explain all of the sites of sicknesses that physicians were observing. Sources such as patients’ serious wounds, corpses, and animals helped them to understand these sites better. This new information required novel terminology to describe previously unidentified (or at least unnamed) parts. Internal evidence from the HC, especially the appearance of the qualifier κἀλεῖν, suggests that authors were aware of their special language for the body and that these were in fact new words or new meanings.

But it is worth asking at this point what type of verbal body these terms make when assembled. Would it have been a patient’s living body or was it something else? I think we must conclude that it was something else. Human corpses, seriously wounded bodies, and, more certainly, animals as sources for medical anatomical knowledge shifted and greatly expanded the model for the medical body away from a lived one. A classical Greek – both professional and non-professional – would learn in these medical texts that the body has ‘flesh’ (σάρξ) and ‘offal’ (σπλάγχνα) just like the parts of an animal sacrifice; one would read that his or her own body is a bewildering collection of things with strange, but sometimes vaguely familiar, names: the *hypochondria* (ὑποχόνδρια) somehow divide the torso in an important way; beneath this is

something called the ἐπιπλόον (*omentum*) that conceals various containers; and all of these are connected by a complex network of channels. These labels highlighted parts of the human body that most classical Greek readers would probably only know about from animal butchery.

In the following chapters I argue that non-specialists, who became exposed to medical ideas through texts and public interaction with doctors, used medical anatomical vocabulary to help to answer and, more often, to problematize the same question asked by physicians: ὅ τί ἐστὶν ἄνθρωπος ('what sort of a thing is a human'). As proof of this, we find in non-technical writings terms that mirror medical vocabulary: words for special divisions of the torso, internal containers, and channels. We also see descriptions in which human bodies become overlapped both with animal bodies and with inanimate objects through shared vocabulary. The verbal medical body, produced through these strange metaphors and compound words, created descriptions of a body almost as curious as the material one. This body, so the medical writers say, is more complex than even the Homeric poems. It is a container that houses a complex network of marvellous parts, each made real by having its own special name.

Chapter 4

The General Public and Medicine in Athens

πάσι γὰρ ἀνθρώποις ἡ γνώμη τοῦ σώματος ἡγεῖται καὶ εἰς ὑγίειαν καὶ νόσον καὶ εἰς τὰ ἄλλα πάντα.

For everyone, the understanding of the body guides the way to health, sickness, and everything else. - Antiphon (DK 2)

Classical authors respected physicians for their perceived ability to cure disease as well as for the sound intellectual foundations of their profession. This general interest in what doctors did encouraged the circulation of medical writings among the intellectual elite, as well as public speeches on this theme. This exposure to both medical texts and speeches provided several opportunities for technical terms to make their way into the vocabulary of non-medical writers.

Hippocratic vocabulary for the body was firmly built upon a foundation already present in the poems of Homer; however, in the HC there appears a shift in certain ways in which the body is described, as well as a significantly higher number of words for the human body (some of which are peculiar to medical writings). This change in ways to talk about the body was aligned with the fresh ideas about health and healing that physicians were exploring. Because of the collaborative nature of treatment that involved both the physician, the patient, and the broader community, these ideas were not restricted to doctors. Nonprofessionals also saw medical thought as a source for information about themselves and their world.

The classical Greeks knew that everyone had a vested interest in knowing how to preserve life. Specifically, they recognized the practicality of learning about the body, how it worked, and how it could be treated when sick. As the author of the Hippocratic *Affections* writes (1):

”Ἄνδρα χρῆ, ὅστις ἐστὶ συνετὸς, λογισάμενον ὅτι τοῖσιν ἀνθρώποισι πλείστου ἄξιόν ἐστιν ἢ ὑγείῃ, ἐπίστασθαι ἀπὸ τῆς ἑωυτοῦ γνώμης ἐν τῆσι νούσοισιν ὠφελέεσθαι· ἐπίστασθαι δὲ τὰ ὑπὸ τῶν ἰητρῶν καὶ λεγόμενα καὶ προσφερόμενα πρὸς τὸ σῶμα τὸ ἑωυτοῦ καὶ διαγινώσκειν· ἐπίστασθαι δὲ τούτων ἕκαστα, ἐς ὅσον εἰκὸς ἰδιώτην.

Any intelligent man, since he is aware that health is the greatest concern to humans, must have personal knowledge to help himself in the case of diseases. Furthermore, he must understand the things that physicians say, the things administered to his own body, and the diagnosis. In each of these areas, he should have enough knowledge as is suitable for a layperson.

The author proceeds in the rest of the work to outline treatments for a variety of health problems and to give descriptions of their symptoms and causes. Cañizares has argued that *Affections* is exceptional within the HC, because it represents a class of medical texts that was not aimed at the professional physician, but rather laypersons.¹ As I discuss below, there is evidence that similar texts were owned by some Athenians.

In addition to the power medical knowledge gives to a patient, the intellectual elite of Athens believed that knowing about the body and disease could be very useful for a variety of reasons. As Antiphon remarks in the quotation at the beginning of this chapter, a knowledge of the body was important for several reasons. I argue in following chapters that one of these was the intellectual elite’s interest in the question ‘what is a human,’ which was shared by medical authors. Part of the interest during the Classical period was therefore spurred by the medical writings that were circulating at the time. Through the lens of treating diseases, they saw potential answers to who they were and what their place was within the universe.

Medicine helped Classical Athenians think about the relationship between themselves, the gods, and nature. Solon, the statesman and earliest surviving Athenian poet (7th - 6th cent.

1 Cañizares 2010. See also Jouanna 1999: 373: ‘The originality of this treatise derives from the fact that it was intended for lay readers rather than for specialists.’ Against this belief, see Potter 1988a: 4-5, who argues that the level of technical sophistication in the work is no different from other Hippocratic works intended for a professional audience. He also sees the second person address in the work as directed at a doctor, not a layperson. Although Potter might be right, it does not undermine the truth of the Hippocratic author’s claim.

BCE),² shows an early interest in this. In poem 13 he describes a person's proper place in relation to both society and the gods. At the centre of this discussion is a person's professional activities. If someone chooses a correct profession, he or she will be rewarded accordingly. He focuses specifically on six skills that assist society: fishing, farming, metalworking, poetry, medicine, and prophecy.³ These skills, or τέχνηαι, have been defined as 'logical efforts' of humankind set against divine fate (μοῖρα).⁴ Despite the ingenuity of our race, we are sometimes faced with things that ultimately are beyond our control. Near the end of his list of professions Solon juxtaposes the power of a seer with that of a physician (13.53-62):⁵

ἄλλον μάντιν ἔθηκεν ἄναξ ἐκάεργος Ἀπόλλων,
 ἔγνω δ' ἀνδρὶ κακὸν τηλόθεν ἐρχόμενον,
 ὦι συνομαρτήσωσι θεοί· τὰ δὲ μόρσιμα πάντως
 οὔτε τις οἰωνὸς ρύσεται οὔθ' ἱερά·
 ἄλλοι Παιῶνος πολυφαρμάκου ἔργον ἔχοντες
 ἰητροί· καὶ τοῖς οὐδὲν ἔπεστι τέλος·
 πολλάκι δ' ἐξ ὀλίγης ὀδύνης μέγα γίγνεται ἄλγος,
 κούκ ἂν τις λύσαιτ' ἥπια φάρμακα δούς·
 τὸν δὲ κακῆς νούσοισι κυκώμενον ἀργαλέαις τε
 ἀψάμενος χειροῖν αἶψα τίθησ' ὑγίη.

King Apollo far-shooter makes another man a seer, he knows the evil coming upon man from afar, if the gods are witnesses. Surely neither augury nor sacred rites can protect against one's allotted fate. Other men, holding the many potions of Paion treat the sick; and there is no certain end to their efforts. Often from a little pain comes a deep disease and he cannot be released from it by gentle remedies; another one, in the grip of a deep debilitating disease, he cures by placing his hands on him.

Solon sees each profession as having its strengths and weaknesses: the augur is unable to alter someone's fate, although he can predict the future; the physician, on the other hand, does not

2 For some recent studies on Solon in his capacity as poet, see Stehle 2006 (arguing that his poetry was carefully composed in order to portray himself as a dispenser of truth); Irwin 2005 (focusing on Solon's appropriation of earlier poetry to bolster his political agenda); Lardinois 2006 (a study of the authenticity of Solon's poetry, arguing for changes of some verses in antiquity).

3 Phillips 1980: 1 connects this grouping of skills in part to Eumaeus' comment at *Od.* 17.381-86, when defending to the suitors his decision to bring Odysseus to the feast: "Who ever goes and calls a stranger from abroad? Unless indeed the stranger is a master of some craft, a prophet, healer of disease, or builder, or else a wondrous bard who pleases by his song; for these are welcomed by mankind the wide world through."

4 See Roochnik 1998: 27-33.

5 Tr. Lewis 2006.

know whether his treatments will be successful, but he can potentially change the course of a sickness. Solon specifically emphasizes that the physician has the capacity to avoid the evil coming to man (ἀνδρὶ κακόν), if it falls under the domain of medicine. Although his craft, specifically his use of soothing potions (ἤπια φάρμακα),⁶ may not always prevail over the sickness, at times it can cure even a serious disease. This cautiously hopeful position toward medicine is clarified in his generalization of human activities near the conclusion of the poem (13.65-6):

πάσι δέ τοι κίνδυνος ἐπ' ἔργασιν, οὐδέ τις οἶδεν
πήι μέλλει σχήσειν χρήματος ἀρχομένου

There is danger in all tasks, and no one knows how something will be from its beginning state.

As mortals we should realize that we can never be completely successful in all of our endeavours;⁷ however, Solon implies that such uncertainty should not prevent someone from attempting a task.

Phillips (following Jaeger)⁸ interprets Solon's comments in this poem as reflecting the Ionian preoccupation with investigating both cause and effect as well as the interaction between parts and their wholes.⁹ This influence is visible in Solon's comment about the importance of the parts of the body (fr. 24):¹⁰

6 It is possible that Solon is wishing to contrast the effectiveness of drugs (φάρμακα) with that of surgery or physical manipulation (χεῖρες). It may also be, however, that Solon, by mentioning both drugs and hands, is only suggesting the scope of the physician's craft. See further Dean-Jones 2003: 101, who likens this passage to *Ajax* 582-83: οὐ πρὸς ἰατροῦ σοφοῦ θρηνεῖν ἐπωδᾶς / πρὸς τομῶντι πήματι ('A wise physician does not wail healing-songs against a pain that requires cutting').

7 As Katz-Anhalt 1993: 64 summarizes: 'In urging people to modify their desires, Solon attempts to enlist in support of the empirically weak proposition that evildoers are inevitably punished, the stronger, more readily accepted proposition that all things in life are uncertain.'

8 Jaeger 1965: 142: 'With Ionian scientific ideas as a pattern, it was easier for Solon than for anyone before him to establish the fact that the political life of a community is subject to divine law.'

9 Phillips 1980. In addition to the influences by Ionic philosophers, Phillips sees a mixture of Homer's praise of doctors, Hesiod's understanding of disease, and contemporary notions of medicine.

10 Tr. Phillips 1980: 2 with modifications; underlining added.

ἴσόν τοι πλουτέουσιν, ὅτῳ πολὺς ἄργυρός ἐστι
καὶ χρυσὸς καὶ γῆς πυροφόρου πεδία
ἵπποι θ' ἡμίονοί τε, καὶ ὧι μόνα ταῦτα πάρεστι,
γαστρί τε καὶ πλευραῖς καὶ ποσὶν ἄβρᾶ παθεῖν,
παιδός τ' ἠδὲ γυναικός, ἐπὴν καὶ ταῦτ' ἀφίκηται,
ᾧρη, σὺν δ' ἤβη γίνεται ἄρμοδίη.

The riches of the man who has much silver, and gold, and fields of wheat-bearing land, horses, and mules are the same as of him who only owns these things: belly, sides,¹¹ and feet that bring him joy, not pain; maybe the blooming charms of boy or woman; and a life in harmony with the changing seasons of life.

Phillips correctly sees this excerpt as suggesting Solon's conception of the body as a 'composite of parts.' Their proper function and maintenance encourage both an absence of disease and what she calls 'the means of positive enjoyment through the satisfaction of normal appetites.' Solon wisely places the economy of body parts as a person's primary concern, since someone cannot fully enjoy life if they are not properly functioning.

Solon suggests that medicine was a worthy and important profession, and that knowledge of both it and the body was useful for everyone to have. In the following century interest in the body, medicine, and the limits of human ability would continue in Athens, but this faith in human power was lifted to new heights by their victory over the Persian empire and the ensuing rewards for the city. The flourishing *polis* attracted some of the brightest intellectual flames of the Mediterranean, and with them came a surge of intellectual activity.

11 Phillips' translation of πλευραί as 'lungs' is potentially misleading, since we would expect to see πλεύμοσι/πνεύμοσι. πλευραί here is best rendered as 'flanks' or 'sides.' Solon's intended meaning, however, is probably inclusive; by πλευραί we are to understand also the ribs and what lies beneath them: the lungs. For the same reasons, we should be careful to understand γαστήρ not as the internal 'stomach,' but rather as the externally visible 'belly.' In both cases, the internal parts are suggested, not explicitly labelled. Solon is seeing the animate body; not inside of it.

This confidence in human endeavours – medicine among them – is reflected by pseudo-Aeschylus’ *Prometheus Bound* (436-506) and Sophocles’ *Antigone* (332-75).¹² These ‘odes to man’ stress one particular point: humans have the abilities to control and understand their environment.¹³ In *Prometheus Bound*, Prometheus tells the story of our meagre beginnings with childlike intellect (νήπιοι) when we lacked the mental acumen to order things (ἔφυρον εἰκῆι πάντα). He gave us sense, the skills to provide for ourselves, and two boons to ordering our world: mathematics and writing. Writing in particular enabled intellectuals of the 5th and 4th centuries to disseminate technical research.¹⁴ *Antigone*, after the programmatic claim, πολλὰ τὰ δεινὰ κούδεν ἄν -/ θρώπου δεινότερον πέλει (‘Many things are amazing, but none more amazing than man.’), describes how the human race has learnt to harness and control most of the natural world for its own ends. The message in both of these works is that we as humans have the unique ability both to understand our world and to master it.

What is most remarkable is that both odes culminate, like Solon’s poem, with humankind’s development of medicine. Pseudo-Aeschylus’ Prometheus prides himself most of all for this gift he has given (476-83):

τὰ λοιπά μου κλύουσα θαυμάσῃ πλέον,
οἷας τέχνας τε καὶ πόρους ἐμῆσάμην·
τὸ μὲν μέγιστον, εἴ τις ἐς νόσον πέσοι,

12 *Antigone* was performed circa 440 BCE. The dating of *Prometheus Bound*, however, like its authorship, is impossible to establish accurately. West 1990: 67-72 argues that the play was written by Aeschylus’ son Euphorion and posits a composition date between 440 and 430 BCE; this is further supported by Sommerstein 2010: 228-32. Griffith 1977: 13 places the play broadly between 479 and 415, establishing a likely *terminus ante quem* of 424, based on perceived parodies of the play within Aristophanes’ *Knights* (424) and *Wasps* (422). See further Flintoff 1983 for the argument that Aristophanes regarded *Pr.* as authentic. The high frequency of the νόσος (‘disease’) and its derivatives in *Pr.* (described by Griffith 1977: 174 as ‘curious,’ since Aeschylus usually employed more allusive and metaphorical language), may suggest a composition around or after 430. Sutton 1983 posits an earlier date of composition, between 460-50 BCE; Flintoff 1986 likewise posits an early, yet less specific date, and argues that it might be the earliest extant Greek tragedy.

13 See Staley 1985 for a detailed discussion of these passages. He argues that they reflect a literary trope that is also seen in the *Odyssey* (18.130-7), *Choephoroi* (585 ff), and the historical sentiments of Protagoras (reflected in Pl. *Prt.* 322a-b). Of these, however, only Solon, *Prometheus Bound*, and *Antigone* mention medicine.

14 Prometheus calls mathematics ‘the most eminent of acquired skills’ (ἔξοχον σοφισμάτων) and writing the ‘remembrance of everything’ (μνήμη ἀπάντων).

οὐκ ἦν ἀλέξῃμ' οὐδέν, οὔτε βρώσιμον
οὐ χριστὸν οὐδὲ πιστόν, ἀλλὰ φαρμάκων
χρεῖαι κατεσκέλλοντο, πρὶν γ' ἐγὼ σφισιν
ἔδειξα κράσεις ἡπίων ἀκεσμάτων,
αἷς τὰς ἀπάσας ἐξαμύνονται νόσους·

Hear the rest, and you will wonder more at the sorts of skills and means that I have devised. The greatest one, if someone fell ill, [formerly] there was no aid at all: no food, no ointment, no potion. Instead, humans withered away from need of medicine, until I showed them the blending of gentle remedies, with which they defended against all diseases.

We may question whether Prometheus here is too effusive in praising the medical art. Certainly pseudo-Aeschylus' physician, as our own, would have been unable to curb all diseases (ἀπάσαι νόσοι). More likely, however, Prometheus' claim is not that humankind has perfected this skill, but rather that he has provided the necessary tools by which this perfection is possible. Evidence for this reading is found in Prometheus' claim that he has given both the skills and avenues (τέχνα καὶ πόροι) for the treatment of disease. It is an optimistic position; we are given the basic crafts of medicine (τέχνα) and the contrivances for preserving life (πόροι), but Prometheus gives no notion that these have been perfected.

Sophocles has the Chorus of *Antigone* respond in a similar manner to the progress of medical advancement and, like Prometheus, they place it at the acme of human achievement (360-67):

...ἄπορος ἐπ' οὐδὲν ἔρχεται
τὸ μέλλον· Αἶδα μόνον
φεύξιν οὐκ ἐπάξεται·
νόσων δ' ἀμηχάνων φυγὰς
ξυμπέφρασται.

σοφόν τι τὸ μηχανόεν τέχνας ὑπὲρ ἐλπίδ' ἔχων
τοτὲ μὲν κακόν, ἄλλοτ' ἐπ' ἐσθλὸν ἔρπει.

In no way does he move forward in time unprepared. Only from Hades will he be unable to break free in flight. But he has devised an escape from diseases for which there was

no remedy. He possesses ingenious knowledge in his skills, and happens sometimes upon evil, and other times upon good.

In contrast to *Prometheus Bound*, the Chorus in *Antigone* remarks that it was the human race who had developed such a remarkable skill. According to the Chorus, humankind has the ability to anticipate everything and to make provisions for it. In the case of medicine this ‘resource of skill’ (τὸ μηχανόεν τέχνας) that the human race possesses allows it to challenge remedy-less diseases (ἀμηχάναι νόσοι). In other words, the medical profession at this time promised to make possible what was previously impossible.

It is probably no coincidence that both the author of *Prometheus Bound* and Sophocles use the terms πόρος, μηχανή and τέχνη to describe the human contrivances. As O’Brien comments, this was the vocabulary of the confident Periclean Athens.¹⁵ It was also language that was common within the HC, in particular *Traditional Medicine’s*,¹⁶ a work that is especially concerned with a self-examination of the art (τέχνη)¹⁷ and methods (ὁδοί) that contemporary doctors employ. The works were probably intended for a lay audience,¹⁸ and although it is risky to assume that either pseudo-Aeschylus or Sophocles had direct knowledge of it, as I shall discuss, there is the good possibility that they might have been exposed to similar discussions.

The following passage in particular captures *Traditional Medicine’s* attention to the ‘paths’ and ‘skill’ of medicine. After questioning the limits of what we can know about ‘things

15 See O’Brien 1978: 58-59.

16 For further discussions about the relationship between *Pr.*, *Ant.*, and *VM*, see Podlecki 2005: 177; Schiefsky 2005a: 63-64; and Jouanna 1999: 232-42. In her discussion of *Pr.*, Irby-Massie 2008: 136 convincingly argues that ‘The author of *Prometheus Bound* was clearly an active participant in the burgeoning scientific and philosophical dialogue.’

17 For further important Classical discussions about the τέχνη of medicine, see Hp. *de Arte* and Pl. *Grg.* 459b *et passim*.

18 For discussion, see Schiefsky 2005a: 40-41.

of the sky and below the earth,¹⁹ the author remarks (2):

ἰητρικῆ δὲ πάντα πάλαι ὑπάρχει, καὶ ἀρχὴ καὶ ὁδὸς εὐρημένη, καθ' ἣν καὶ τὰ εὐρημένα πολλά τε καὶ καλῶς ἔχοντα εὐρηται ἐν πολλῶ χρόνῳ, καὶ τὰ λοιπὰ εὐρεθήσεται, ἣν τις ἰκανός τε ἔων καὶ τὰ εὐρημένα εἰδῶς, ἐκ τούτων ὀρμώμενος ζητήῃ.

The art of medicine has long ago had everything at hand, and its foundation and method have been discovered. Through these, there have been many excellent findings over the course of much time. Those that remain will be discovered if the investigator is skilled, knows what has previously been found, and begins his search from these principles.

The author of *Traditional Medicine* shows the same exuberance for the possibilities of human achievement as Aeschylus and Sophocles, because he believes in humankind's ability to predicate investigations upon sound and organized previous research into our world. The practice of medicine is an excellent forum to exhibit to the intellectual elite just how human-designed skills can help a society. Unlike comparatively abstracted research into 'things in the sky and beneath the ground,' medicine can promise people an extension of life, something that is sure to attract interest.

Solon had commented that the results of medicine are inconsistent, a seemingly common charge against the profession that was countered with efforts to show that it is indeed an art (τέχνη) like any other.²⁰ The sentiments of pseudo-Aeschylus and Sophocles suggest that the matter appears to have been more or less settled in Athens by the mid 5th century. Each poet describes medicine as a τέχνη that is able to avert the course of disease. Furthermore, they suggest that medicine is an excellent example of the sort of beneficial human mechanisms devised in the development of an art. Their confidence in human accomplishment is

19 Sect. 1: οἷον περὶ τῶν μετεώρων ἢ τῶν ὑπὸ γῆν. This apparently was a common criticism against what some people saw as the pointless pursuit of natural philosophy, e.g. Aristophanes' *Clouds* (230-31) which is alluded to in Plato's *Apology* (19c). For discussion, see Konstan 2011: 76, Fagan and Russon 2009: 232 and Strauss 1996: 14-15.

20 See for example the argument in Hp. *de Arte*. For discussion, see the introduction to chapter 3 above.

unconcealed. One of the few traits that distinguish humans from the gods is our mortality, and both dramatists suggest that the Greeks were successfully narrowing this division.

Concepts of disease were appropriated by other authors as well, who integrated them into analogies for their own work. Plato is a prime example of the flourishing metaphorical use of disease in the fourth century.²¹ He uses the disease metaphor frequently in illustrations of both ethical and political corruption,²² and goes so far as to state that νόσος can be applied universally (*R.* 10.608e-609a):

Τί δέ; κακὸν ἐκάστω τι καὶ ἀγαθὸν λέγεις; οἶον ὀφθαλμοῖς ὀφθαλμίαν καὶ
σύμπαντι τῷ σώματι νόσον, σίτω τε ἐρυσίβην, σηπεδόνα τε ξύλοις, χαλκῷ δὲ καὶ
σιδήρῳ ἴον, καί, ὅπερ λέγω, σχεδὸν πᾶσι σύμφυτον ἐκάστω κακόν τε καὶ νόσημα;

So, would you not say that there is something good and bad for everything? For instance, ophthalmia [a general term for a variety of different eye complaints]²³ for the eyes and disease for the entire body, blight for grain, rot for wood, rust for bronze and iron. What I'm asking, is there a natural badness and disease for nearly everything?

The analogy can be sustained for some time in Plato's medical models of ethics and politics, because although a state and someone's personality are both conceptually unified like the body, all three are complex wholes. Each is composed of parts that individually can become corrupted, and thereby be made contagious. The task of the good statesman, philosopher, and doctor is to identify the contagious part(s) and to treat them. The use of medical analogies for his discussions suggests that Plato expected his audience to be familiar with at least the basic tenets of contemporary medical theory, if for no other reason than they had practical interests in ensuring bodily health.

21 Plato's use of medicine and medical language is more fully investigated in chapter 7 below.

22 E.g. ethical corruption: *Ly.* 217b, *R.* 3.408e; political: *R.* 3.404e-405a, 5.470c, 8.556e, *Lg.* 720c. See Lidz 1995 for a useful summary of the key themes of Plato's use of this metaphor.

23 See Lascaratos and Marektos 1988 for a useful discussion of ophthalmia and related eye complaints in the Hippocratic Corpus.

In the works of Plato and other intellectuals an understanding of the body and disease was used to inform Athenians about morality and politics. The analogy was especially useful, because of a presumed basic understanding about the practicality of medicine and its beneficial (and ambitious) aims. It would have been common knowledge in Athens that doctors at least tried to help the sick. For example, Thucydides reports that doctors tried to help the sick during the plague of Athens (430/29 BCE), even though their work appeared unsuccessful and they were risking their own lives by visiting patients (2.47.4). Furthermore, they had explanations for why their treatments would work.²⁴ This perceived power of a physician's knowledge encouraged nonprofessionals like Plato to explore medical theories for themselves. Some medical information would have been spread through the public's contact with physicians either professionally or socially;²⁵ however, the medical texts that were circulating at this time provided another way for the educated layperson to access medical ideas and language.

Aristotle defines the relationship between medical professionals and nonprofessionals in Classical Athens. In his *Politics* (1282a) he describes three types of 'doctor':²⁶

ἰατρὸς δ' ὅ τε δημιουργὰς καὶ ὁ ἀρχιτεκτονικὸς καὶ τρίτος ὁ πεπαιδευμένος περὶ τὴν τέχνην· εἰσὶ γὰρ τινες τοιοῦτοι καὶ περὶ πάσας ὡς εἰπεῖν τὰς τέχνας· ἀποδίδομεν δὲ τὸ κρίνειν οὐδὲν ἥττον τοῖς πεπαιδευμένοις ἢ τοῖς εἰδόσιν. ἔπειτα καὶ περὶ τὴν αἴρεσιν τὸν αὐτὸν ἂν δόξειεν ἔχειν τρόπον.

Of the three classes of physician, there is the public worker, the master physician, and lastly the one who has [only] studied the art, for there are such people in all crafts. We grant that people who have studied the art are no less able to make judgements about it than those who practice it.

24 The devastating and long-lasting effects of the plague almost certainly influenced Athenians' impressions about the looming threat of disease and the importance of physicians to combat it. See further 236-41 below.

25 The physician Eryximachus' appearance in Plato's *Symposium* is one example of their social activity in Athens. See chapter 7 below for discussion.

26 For further analysis of this passage, focusing mainly on the first two classes (δημιουργὰς καὶ ὁ ἀρχιτεκτονικός), see Kudlien 1985. For discussion of its relation to medical ethics, see Harrow Feen 1983: 43; for the physician in his role as a scientist or a craftsman, see Horstmanshoff 1990.

The first two classes, those of the public (δημιουργός) and the master (ἀρχιτεκτονικός) physician are either directly or indirectly involved with the practice of medicine. Although the exact relationship between these groups is unclear, it is probable that the master physician differs from the public one only in that he has an understanding of the ‘why’ of medicine, not just the ‘how.’²⁷ The third class of ‘doctor’ does not practice the craft; he has, however, studied it (πεπαιδευμένος). Kudlien in his analysis of this passage provides the gloss ‘medizinisch Gebildeten,’ and since Aristotle was himself perhaps the son of a physician, he includes the philosopher in this category.²⁸

Jaeger explains how medicine in Classical Athens resided at the very peak of esteemed, elite, and educated professions.²⁹ Learning about medicine (both practical and theoretical), however, was not limited only to physicians. The profession also attracted the interest of laypersons, who wished to learn about the art for themselves. This eventually led to Aristotle’s third class of physician, the person who is educated about medicine but does not practice it. Some of this contact with medical ideas came from medical writings circulating in Classical Athens. In Xenophon’s *Memorabilia*, Euthydemus, a sophist and older contemporary of Socrates, tells Socrates that, πολλὰ γὰρ καὶ ἰατρῶν ἔστι συγγράμματα (‘there are also many treatises by physicians [in my library]’) (*Mem.* 4.2.10).³⁰ It is clear from his comments, however,

27 Aristotle (*Met.* 981a) believes that the distinguishing mark between the ἀρχιτέκτων and the χειροτέχνης is that the ἀρχιτέκτων is able to provide rationales (αἰτίαι) for his actions. By implication this would make the χειροτέχνης someone who follows procedures that have a history of being successful without understanding exactly why they work. For discussion, see van der Eijk 2005a: 195-96. Cf. *Pl. Lg.* 4.720b, where he divides practicing physicians into two classes: those who learn empirically [κατ’ ἐμπειρίαν τὴν τέχνην], and those who learn the nature of medicine [κατὰ φύσιν].

28 Kudlien 1985: 428. For the evidence that Aristotle’s father Nicomachus was a physician, see Natali 2013: 8-11. Natali suggests that comments about Nicomachus’ profession might be later assumptions based on Aristotle’s clear interest in medicine in his works.

29 1944: 3-45. This significant chapter, while spending limited time examining direct evidence for the role of medicine in the Athenian encyclopaedic education, provides an excellent overview of the intellectual cross-pollination between medicine and other intellectual pursuits, especially metaphysics and politics.

30 For what this section suggests about the literary education in 5th century Athens, see Morgan 1999: 54. He later summarizes that such works describing literary education emphasized, ‘the cultural uses of literacy at the expense of the practical’ (57). For this passage’s links to Plato’s *Hippias Major*, see Phillips 1989.

that he has no designs to become a physician himself.³¹ Xenophon portrays the scope and volume of Euthydemus' library as exceptional. Although this does not mean that such libraries were in Athens during the dramatic date of the dialogue, likely sometime in the final quarter of the 5th century, it does imply that they could exist when the *Memorabilia* was composed (probably in the 350s).³² We cannot expect such a large personal collection to have been common-place in Classical Athens, yet it is evidence that medical texts were available and sometimes owned by the general public.

Minos, a work attributed to Plato,³³ suggests a similar accessibility to medical texts in Athens (316c):

ΣΩ. ἤδη ποτὲ ἐνέτυχες συγγράμματι περὶ ὑγιείας τῶν καμνόντων;
 ΕΤ. Ἔγωγε
 ΣΩ. Οἶσθα οὖν τίνος τέχνης τοῦτ' ἐστὶ τὸ σύγγραμμα;
 ΕΤ. Οἶδα, ὅτι ἰατρικῆς.

Socrates: Have you ever come across a treatise on health for the sick?

Friend: I have.

Socrates: Then you know what skill [*technē*] it is that this is the treatise of?

Friend: I do know – medicine.

Like Euthydemus in the *Memorabilia*, the unnamed friend of Socrates appears to have had no interest in pursuing medicine as a profession, yet he likely recognized the usefulness of

31 To Socrates' question whether Euthydemus aims to become a physician (ἰατρός) because of his many books on the subject, he responds 'By Zeus, I'm certainly not!' (μὰ Δί', ἔφη, οὐκ ἔγωγε).

32 The dramatic dates of the dialogues in the *Memorabilia* are difficult to pinpoint; however, for an example, Dillery 2002: 469 locates *Mem.* 3.5 between the battle of Delion (424 BCE) and the death of Pericles the Younger (406 BCE). For the composition date of books 3 and 4 to sometime during the 350s see Gray 1998: 4 n.18; Macleod 2008: 58 dates these books more broadly to sometime after 371 BCE.

33 Taylor 1926: 521-22 dates the *Minos*, along with a number of other works of questionable authorship, to sometime within the later half of the fourth century. Dalfen 2009: 28 dates it to either the fourth or third century, when it was collected along with all other works supposed to be Plato's into the Tetralogies by one of his successors. The close connection between concepts explored in *Minos* and in *Laws* is stressed by Mulroy 2007: 115-16, who likens *Minos*' unpolished form to the sketches of Picasso, and sees it as a superficially crude, yet inspired, work of a master. Lewis 2006a: 18 n.3 expresses a similar view that it is perhaps an unpolished dialogue of Plato's. He provides a full bibliography of earlier appraisals both in favour and against *Minos*' authenticity at 17 n. 2. Whether or not we ascribe the work to Plato, it seems to have been written close enough to Plato's life to suggest the circulation of medical texts in Athens during the 4th century.

understanding medicine for the maintenance of his own health. He perhaps also enjoyed the social capital he gained from having some knowledge about the art of medicine. Several other such comments from 5th and 4th century Athenians suggest that medical texts were both available and of interest to the non-professional.³⁴

There is also some evidence that Hippocratic writings were specifically circulating in Athens. Plato, for example, famously provides the earliest reference to the historical Hippocrates, and comments on the physician's methodology (*Phdr.* 270c).³⁵ This suggests that he not only knew the name of the famous physician, but that he also had some familiarity with Hippocrates' theories.³⁶ We also have evidence for at least one Hippocratic author visiting Athens. Athenian patients are mentioned twice within the *Epidemics* (5.5.9 and 10), a work that contains a collection of clinical notes by itinerant doctors. This increases the likelihood that other Hippocratic authors visited the city as well, and disseminated their knowledge while they were there.

In addition to access to medical texts, it is also possible that Athenians had the opportunity to hear speeches on medical themes. There is good evidence that at least some of the works contained within the HC were originally speeches or lectures.³⁷ For example, *The Art*,

34 Plato's eponymous Phaedrus, for example, challenges the limits of what one can learn from a text (*Phdr.* 268c): οἶμαι ὅτι μαινεται ἄνθρωπος, καὶ ἐκ βιβλίου ποθὲν ἀκούσας ἢ περιτυχῶν φαρμακίῳ ἰατρὸς οἴεται γεγονέναι ('I think a man is mad if he thinks that he has become a physician by hearing something from a book or by stumbling upon a drug'). Aristotle (*Pol.* 1287a) also believes that the inefficiency of learning practical medicine from a book (τὸ κατὰ γράμματα ἰατρεύεσθαι φάσιν) is not analogous to the practice of politics. See also Diocles 17.11 and Diogenes fr. 9.2.

35 Plato mentions Hippocrates again in passing at *Prt.* 311b-c.

36 The scholarship on this section of *Phaedrus* is extensive, but the question of Hippocrates' own theories is not directly relevant here. For analyses on the topic, see for example, Jouanna 1999: 6 and Nutton 2004: 56-58, who discuss the importance of the passage for identifying the theory held by the historical Hippocrates. For fuller analyses of the possible meanings of this passage, see Herter 1976, Mansfield 1980, and Tsekourakis 1993, as well as de Vries 1982 and Verdenius 1982 for shorter companion notes on the meaning of terms in this passage. On Plato's appropriation of contemporary medical discussions, see section 7.3 below.

37 Jouanna 2012: 41, for instance, argues that the contrast made at *IM* 1 between speaking (λέγειν) and writing (γράφειν) about medical ideas 'proves without any doubt the existence of two distinct categories of medical works.'

Breaths, and *Traditional Medicine* are commonly considered to be rhetorical pieces intended for either lay or mixed audiences.³⁸ The Hippocratic work *Nature of Humans* also alludes to such speeches (1):³⁹

γνοίη δ' ἂν τις τόδε μάλιστα παραγεγόμενος αὐτέοισιν ἀντιλέγουσιν· πρὸς γὰρ ἀλλήλους ἀντιλέγοντες οἱ αὐτοὶ ἄνδρες τῶν αὐτέων ἐναντίον ἀκροατέων οὐδέποτε τρίς ἐφεξῆς ὁ αὐτὸς περιγίνεται ἐν τῷ λόγῳ, ἀλλὰ ποτὲ μὲν οὗτος ἐπικρατεῖ, ποτὲ δὲ οὗτος, ποτὲ δὲ ὧ ἂν τύχη μάλιστα ἢ γλῶσσα ἐπιρῥυεῖσα πρὸς τὸν ὄχλον.

A person can especially see [that people debating theories based on unobserved phenomena are wrong] by attending their debates, since those arguing with one another never win three times in a row before the same audience. Sometimes it is one debater [who wins], sometimes the other, whoever happens to have the most eloquent tongue in front of the crowd.

Jouanna further comments on the aspect of public performance – both formal and informal – among a physician’s skills:

Whether he received patients in his office or made the rounds of his patients in their homes, the physician was never alone with the patient. The patient’s entourage of family and friends, together with other curious onlookers, made up a public before which the physician was obliged to perform, above all if he carried out a surgical procedure or if he engaged in oral argument with a rival physician.⁴⁰

This need for a physician to prove himself to the broader community appears to be part of an instability of the medical profession at this early stage (i.e. a reaction to public concern about who is an authority on medicine) when a physician’s new ideas would be tested in the forum of

38 On *The Art* as an epideictic speech, see Mann 2012: 8-20, Jouanna 1999: 378, and Miller 1949: 314, who also lists *Breaths*. For *Traditional Medicine* as a speech intended for a lay or mixed audience, see Jouanna 1999: 376 and Schiefsky 2005a: 36-46. For the Hippocratic *Oath* (both ancient and modern versions) as a piece of epideictic rhetoric, see Keränen 2001. See Jouanna 1999: 80-84 and Jouanna 2012: 39-53 for general discussions about the rhetoric of HC. For Empedocles’ status as a physician and an excellent orator (ἰατρὸς ἦν καὶ ῥήτωρ ἄριστος), a comment made in Satyrus of Callatis’ *Lives* (written sometime before 145 BCE), see D.L. 8.58. The connection between the arts (τέχναι) of medicine and rhetoric was something of a trope in Classical Athenian philosophical discussions. See for examples, Pl. *Phdr.* 270c and *Grg.* 465d *et passim*; Arist. *Rh.* 1355b *et passim* and *Top.* 101b. See also Roth 2008, a dissertation on the intersection of rhetoric and medicine in ancient Greece.

39 For similar comments, see *VM* 1 and *Morb.* 1.1 (also van der Eijk 2005a: 36 n. 48-49).

40 Jouanna 1999: 75. Jouanna (76) also notes that the author of *The Canon* in his introduction (1) remarks on the performative aspect of the medical profession in his comment that a quack physician is like a mute character in a play who, while dressing and appearing like an actor, is not one.

public opinion. Although there is no direct evidence of any particular medical speech taking place in classical Athens, the popularity of medical texts in the city suggest that medical speeches would be equally welcomed. These would have allowed another medium through which the educated (but non-specialized) elite could have been exposed to medical vocabulary.

Athenian writers were aware that doctors had a specialized vocabulary. For example, Xenophon in *Cyropaedia* comments that doctors are expected to know the names of drugs (φαρμάκα) and the tools (ὄργανα) of their profession (5.3.47). Although *Cyropaedia* is ostensibly located in the context of Persian society, it is above all else a didactic work intended for an Athenian audience. Evidence from other authors confirms that Xenophon's comment reflects the language of Athenian physicians. Plato's *Republic* shows a belief that doctors had invented a variety of names for diseases (405d):⁴¹

ῥευμάτων τε καὶ πνευμάτων ὡς περ λίμνας ἐμπιπλαμένους φύσας τε καὶ
κατάρρους νοσήμασιν ὀνόματα τίθεσθαι ἀναγκάζειν τοὺς κομψοὺς
Ἄσκληπιάδας, οὐκ αἰσχρὸν δοκεῖ; Καὶ μάλ', ἔφη· ὡς ἀληθῶς καινὰ ταῦτα καὶ
ἄτοπα νοσημάτων ὀνόματα.

Doesn't it seem shameful that [people because of idle lifestyle and poor diet] are filled with phlegm and air like swamps, which then compels the Asclepiades [i.e. doctors] to assign the names "flatulence" and "catarrh" to these diseases? "Yes indeed," [the interlocutor] said, "these names for diseases are truly novel and strange."

The truth of Plato's statement is evident from the frequent appearance of both words in the HC.⁴²

Thucydides in a description of the physical effects of the plague of Athens (430/29 BCE) makes a similar remark that doctors had a variety of terms for material in the body (2.49.3):⁴³

41 See also Men. *Aspis* 340-41, where a character describes a clever doctor (ἰατρός τις φιλοσοφῶν) who provides the medical diagnoses πλευρίτις ('pleuritis') and φρενίτις ('phrenitis').

42 E.g. κατάρρους: *Morb. Sacr.* 9, *Epid.* 7.68, *Gland.* 14, *Aër.* 10; φύσα: *VM* 22, *Epid.* 5.20, *Coac.* 285, *Morb.* 2.69.

43 See Pl. *Ti.* 83c for the comment that the common name (κοινὸν ὄνομα) 'bile' (χολή) was either invented by doctors or by someone else who was able to see through the plurality of different substances and to apprehend them as a single substance deserving one name. (He is here referring to the 'black' [μέλαν], 'bilious' [χλωῶδες] and 'yellow' [ξανθόν] biles. See Cornford 1937: 338 n. 3 for discussion.)

ὅποτε ἐς τὴν καρδίαν στηρίξειεν, ἀνέστρεφέ τε αὐτὴν καὶ ἀποκαθάρσεις χολῆς
πάσαι ὅσαι ὑπὸ ἰατρῶν ὠνομασμένοι εἰσὶν ἐπῆσαν.

When [the plague] seized the heart, it upset it and caused bile to be purged, as many types
as doctors have names for them.

There also seems to be some expectation that intellectuals should be familiar with such
language. We see this implied at the conclusion of the Platonic *Rival Lovers* (*Anterastai*), a
dialogue in which Socrates argues against polymathic education in favour of one that encourages
self-reflection towards the good. Socrates questions his interlocutor about the non-professional's
need for familiarity with medical discourse and perhaps jargon (138d):⁴⁴

Πότερον οὖν τῷ φιλοσόφῳ, ὅταν μὲν ἰατρός περὶ τῶν καμνόντων τι λέγη,
αἰσχρὸν μὴθ' ἐπεσθαι τοῖς λεγομένοις δύνασθαι μῆτε συμβάλλεσθαι μηδὲν περὶ
τῶν λεγομένων ἢ πραττομένων, καὶ ὅποταν ἄλλος τις τῶν δημιουργῶν,
ὡσαύτως·

Whenever a doctor says something about sick people, is it not shameful if the philosopher
neither follows what is being said nor responds to what was said or done? And isn't it the
same when he has a conversation with any other craftsman?

This opinion echoes that made in *Affections* 1 quoted in the epigraph to the chapter. It was
important for a layperson – and perhaps more so for an educated layperson – to have a
familiarity with medical language. Although it was useful for any patient to understand a doctor
and what was being done to his or her body, someone from the educated elite might have been
expected to have an even greater familiarity, so that he or she could hold intelligent and informed
conversations with medical professionals.

These examples illustrate that there were terms which properly belong to the medical
profession and, at least in some instances, that they were created by doctors. These comments by

44 On the authenticity of *Rival Lovers*, see Peterson 2011: 196 n.1, Crombie 1962: 225, and Sprague 1976: 119-21,
who argue either that it is genuine or at the very least that its authenticity has been rejected on weak grounds.
For claims that the work is spurious, see Centrone 2005. If the work is inauthentic, then it is likely that it was
composed by a member of the Academy after Plato's death (348/7 BCE), perhaps near the end of the 4th century
(Männlein-Robert 2005).

non-technical authors further show that they were aware of this vocabulary. The remark in *Rival Lovers* provides an especially strong case for an intellectual environment in Athens that encouraged nonprofessionals to familiarize themselves with medical discourse and its vocabulary along with it.

The evidence suggests that the Athenian educated elite had a positive opinion of the medical art. This encouraged a general interest in medicine, which led some to learn more about it through medical texts and likely speeches. It also seems that nonprofessionals such as Euthydemus could gain some prestige by learning about medical theories as an intellectual hobby. Most importantly, the evidence from Xenophon, Plato, and Thucydides suggests that nonprofessionals were aware that the medical profession had a specialized language and that the broader intellectual elite had some knowledge of it. That these conditions existed in Classical Athens makes it probable that medical thought – and with it, medical language – became part of a greater dialogue taking place within the Athenian intellectual community. In the following chapters I argue that some medical terminology – specifically that for the human body – made its way into the writings of nonprofessionals. Beyond the practical value of medical information, the Athenian public appears to have been interested in how medical writers talked about the body. Their language was novel, and this permitted other authors with the ability to appropriate it to frame the banal ‘normal’ body in fresh, exciting, ways.

Chapter 5

The Body in Tragedy

Through an examination of terms for the body used by tragic playwrights in the 5th century, I demonstrate in this chapter that both Sophocles (*ca.* 496-406 BCE) and Euripides (*ca.* 480-406 BCE) used uncommon vocabulary to describe the human body that mirrors contemporary medical language. When integrated into tragedy, these terms became ways for playwrights to explore (and sometimes to complicate) what a human is, particularly in the context of suffering bodies. As in following chapters, these terms were selected for their parallels with specific areas of interest to physicians: the division of the torso (with emphasis on its role as a container), bodily channels (as the means of conveying fluid in the body), and specific bones (with emphasis on articulation and formation).¹ Most of the words I discuss come from plays dated to around the last quarter of the 5th century, which aligns with the rise of Hippocratic writings. Aeschylus (*ca.* 525-456 BCE), in comparison, seems either to have been more reluctant to use or (which is more likely) to have been ignorant about technical medical terms.

I wish to argue that 5th century tragedians used this anatomical language for a specific purpose: as a supplement to unusual poetic (Homeric) vocabulary, it enabled them to recast the living body in fresh, engaging, ways that retained the sense of their medical origins. Their use of archaic/poetic Homeric body terms, beyond suiting the legendary themes and characters of the dramas, served to produce verbalized bodies that were unlike those sitting in the audience. The

¹ Terms that receive special attention are κτείς (fingers and knuckle-joints of the hand) *A. Ag.* 1594; terms for the torso: κύτος, *S. Tr.* 12; θώραξ, *E. HF* 1095; χέλυς, *E. El.* 836; ‘channels’: φλέψ, *Ar. fr.* 241 K.-A., *S. Ph.* 825, *E. Ion* 1011; σῦριγξ, *S. Aj.* 1412; πύλα, *E. El.* 828; ἀρτηρία, *S. Tr.* 1054; ‘skull sutures’: ῥαφαὶ ὀστέων, *E. Ph.* 1159-60, *Supp.* 503.

burgeoning anatomical language of medicine provided playwrights with another source that they could exploit. By using new coinages and metaphorical vocabulary of the medical community – the more opaque compound words of medical writers seem to have been ignored – the tragedians could reframe the human body.

To illustrate this, I first discuss the similarities between medical anatomical vocabulary and poetic diction. I pay particular attention to how these rare words were potentially unclear or perhaps only vaguely familiar to the audience because of their restricted uses within poetry and medicine. I further claim that the term ‘grotesque’ most accurately reflects the imagery that tragedians were creating in their representations of bodies. Secondly, through an examination of specific terms, I suggest that these grotesque bodies – of suffering heroes, monsters, and animals – emphasized unnatural states of being, which could destabilize the audience’s understanding of what a human is. As broader contributions, I further show both the willingness of tragic playwrights to integrate newly emerging specialized vocabulary into their poetic diction and how this vocabulary could be received with anxiety and wonder outside of its medical context.

There is good reason to suspect that tragedians had both opportunities and reasons to appropriate contemporary medical language. Beyond an admiration of the medical art that is suggested in their plays, there is evidence that Aeschylus, Sophocles, and Euripides all had special interests in natural philosophy or medicine.² The tragedies of Sophocles and Euripides in

2 See Holmes 2010a: 231-34 (with special focus on the connection of Euripides). Craik 2001a: 82 likewise proposes based on medical and biological concepts that Euripides might have been familiar with certain writings of the HC, along with the natural philosophers Democritus of Abdera and Empedocles (others can be added to this list, including most notably Anaxagoras; see Dillon 2004 for his inclusion in a robust list of intellectuals that might have affected Euripides). Craik also posits Aeschylus’ possible connection to the medical schools in Sicily where he visited. Mitchell-Boyask 2008: 112-13 discusses the historical claim that Sophocles was the *dexios*, the ‘receiver,’ of the cult statue of Asclepius upon its first arrival to Athens. Although there is sufficient reason to suspect that this tradition might have been derived from the strong medical and disease language in some of his plays (for an even greater sceptical evaluation of this tradition, see Connolly 1998), Mitchell-Boyask allows for the likelihood that Sophocles had some role in the early establishment of the cult in Athens. Hartigan 2005: 176 similarly argues for the possibility that Sophocles had some role in the introduction of the cult. For epigraphical evidence that a contemporary of Sophocles, a certain Telemachus, was the one who determined the place for the Athenian Asclepius, see Aleshire 1989: 34 (cf. *IG II²* 4960 and *SEG* 25.226).

particular were being produced at the same time as medicine was becoming popularized among the educated elite. These trends inevitably influenced the dramatists, and left their marks in the plays. Playwrights were working within a tradition that often privileged older poetic vocabulary – especially that of Homer – which inevitably led to generally conservative diction when describing the human body on the stage. But they were also composing plays for an audience, which meant that they also used language that would appeal to the public’s changing tastes.³

Compared to the Homeric epics, however, no single author or work of classical Greek drama displays the same breadth of vocabulary for the body. In tragedy, specific references to body parts are particularly sparse, and as such less attention has been paid to the language used. This is due at least in part to tragedians’ appropriation of Homeric terminology, which has often been treated as maintaining very similar semantic fields. A few scholars, however, have evaluated and compared tragic body vocabulary with that of the HC in particular. Their findings have generally illustrated that tragedians went beyond Homeric language for the body, and in several cases likely adopted technical (or quasi-technical) vocabulary.

5.1. Previous scholarship

Beginning in the early 1900s there has been a concentrated but limited scholarly interest into the appropriation of medical language by tragedians.⁴ Dumortier in his study of medical language in

3 For example, see Allan 2005: 74 (in an examination of growing philosophical trends in tragedy and Athenian society) for his comment on Athenaeus 561a, that Euripides was the ‘philosopher of the stage’: ‘[I]t points to the tendency of his characters (more than those of Aeschylus and Sophocles) to express ideas of a philosophical interest, often in an argumentative manner.’

4 Scholarship on the tragedians’ use of medical innovations on disease and treatment is especially prolific. The general reason for this is that as we approach the end of the 5th century ‘disease’ (νόσος, νοσήμα) becomes an increasingly popular expression for suffering – both literal and metaphorical – upon the stage. See Smith 1967: 291-94 for a useful discussion of this function of disease metaphor in tragedy; particularly important is his discussion of the increasingly transgressive meaning of ‘disease’ in tragic diction. On medical language in Euripides specifically, he writes ‘Medical concepts are useful vehicles for his thought and expression not only because they offer a controlled description of the mechanism of mental aberration, but also because they deal in complex processes of reaction and compensation which cause both health and disease’ (Smith 1967: 306). See Mitchell-Boyask 2008: 28-36 for a study and statistical analysis of the use of νόσος in 5th century tragedies. See Hartigan 2005 for a discussion of the healthful effects of drama – both ancient and modern – upon the audience.

Aeschylus is one of the earliest examples of an attempt to identify medical anatomical terminology in tragedies; however, with the exception of λοβός (the lobe of the liver), all terms mentioned are common outside of medical writings.⁵ Expanding upon Dumortier's work, Miller argues that all three Athenian tragedians consciously used such language, either literally or metaphorically, to produce certain literary effects.⁶ The main reason for medical language's inclusion into tragic diction in the 5th century, he claims, is that the language inherited by the poets became increasingly insufficient to express new concepts that were appearing in their city. From examples of anatomical terms, maladies, and medical treatment, he concludes that tragedians were in fact engaging with medical notions that were circulating either orally or textually in Athens; however, he argues correctly that it is impossible to connect these words to one specific medical text with any certainty. Such textual connections could only be established if the full collection of medical texts in circulation in 5th century Athens was known.

Collinge's work on the tragedians' use of medical language and their attitudes toward medicine in general follows a similar line of investigation as Miller's. His study, which focuses upon the extant plays of Aeschylus, Sophocles, and Euripides, excludes almost any discussion of anatomical language. Instead, he focuses on terms for physical and mental illnesses and their treatment.⁷ Collinge makes the important point that 'medicine is perfectly poetic'; there was no incongruity in the use of medical terms and imagery in tragedy.⁸ His general assessment is that

5 Dumortier 1935: 1-26. The following terms are discussed: θυμός, καρδία, φρήν (φρένες), πραπίδες, στέρνον, στήθος, έντερα, σπλάγχνα, κώλον, γαστήρ, νηδύς, ήπαρ, λοβός, χολή, πλεύμονες, αίμα, γάλα, άγάλακτος, δάκρυ, γόνος. Dumortier's work apparently encouraged Stanford in his study of Aeschylean style to focus his analysis of scientific language solely on medicine (Stanford 1942: 54-58). The lack of previous attention to medical language in tragedy is likely what led him to conclude (misleadingly) that 'Aeschylus's references to the rapidly developing science [*sc.* medicine] are far more copious than those of his predecessors or his contemporaries.' For Dumortier's tendency to push the connection between Aeschylus and Hippocratic authors too far, see Kosak 2004: 12 n. 23.

6 Miller 1944.

7 The handful of anatomical terms discussed by Collinge are the κοτύλη 'cup-joint' (but in reference to *Il.* 5.306), χολή 'gall (-bladder),' μυελός 'marrow,' and έγκέφαλος 'brain.'

8 Collinge 1962: 44.

all three tragedians made some use of medical vocabulary. Drawing upon Earp's analysis of Aeschylus's style, he argues that the poet became increasingly comfortable or familiar with medical imagery in his plays. Although there is no such imagery in *Persians*, *Seven Against Thebes*, and *Suppliants*, there are six appearances in *Agamemnon*, seven in *Libations Bearers*, and three in *Prometheus Bound*.⁹ In an examination of primarily disease words used by Sophocles (but with scant reference to any Hippocratic works), he claims:

Sophocles is more truly medical, more seriously and instinctively a devotee of the craft, than any other literary figure of the fifth and fourth centuries except (if we can call him literary) Aristotle.¹⁰

Collinge implies that Euripides, whom he identifies as Sophocles' younger contemporary, in comparison, was most accustomed to the burgeoning language of medicine in the 5th century, and therefore used it more casually than either Aeschylus or Sophocles (although the two composed dramas concurrently for forty years and Euripides outlived Sophocles).¹¹

Terrase offers further insight into Sophocles' interest in current medical trends.¹² She argues convincingly that Sophocles (in particular, in his *Philoctetes*) contrasts the irrationality of disease with the rationality of medicine. Disease (either metaphorical or literal) in this play is likened to a beast, whereas the medical art is strictly a possession and product of humankind.

9 Collinge 1962: 46. See also Earp 1948: 108.

10 Collinge 1962: 47. Biggs 1966 further analyzes the themes of disease in Sophocles' *Ajax*, *Philoctetes*, and *Women of Trachis*. Although Biggs accepts the use of disease imagery and its apparent similarity to Hippocratic works, she argues that these connections are subordinate to their function as dramatic symbols. See also Kosak 2006 for an illuminating study of masculinity in *Philoctetes* through the lens of Greek medical thought. Psichari 1908 provides an early discussion of medical terms in *Philoctetes*, who focuses upon Sophocles' mention of the staunching of blood (σπαρζει...αίμα 782-4) and the 'blood-flowing vein' (αίμορραγής φλέψ 825; see section 5.4.1 below for discussion), along with a handful of nosological terms. For a discussion of pharmacology in *Philoctetes* (ἀλεῆς ὕπνος at 859), see Jouanna 1983.

11 Collinge 1962: 45: 'In [Euripides], medical vocabulary is a mixture of technical and non-technical, plain and figurative: for him, doctor's terminology was a store to be raided and exploited.' Kahn 1970 to an extent echoes Collinge in his examination of the tragedians' response to and appropriation of scientific and technological changes during the 5th century. He depicts Aeschylus as writing in an age of exuberance after the Persian War, which persisted long enough to affect heavily Sophocles' core positive outlook for the limits of human ingenuity. Collinge argues the younger Euripides, in contrast, became increasingly more pessimistic about human accomplishments as Athenian vitality waned in the face of the Peloponnesian war.

12 Terrase 2001.

When suffering from a sickness, Sophocles' tragic characters become more beast-like themselves, thereby blurring the human/animal dichotomy.¹³ Also focusing on Sophoclean medical language, Ceschi devotes a chapter specifically to anatomical terms. He concludes that Sophocles occasionally did use medical anatomical terminology, but makes the difficult claim that his language would have been clear to his audience.¹⁴

Craik's study of medical references in Euripides is an excellent analysis of the relationship between medicine and tragedy in the 5th century. Beyond her important discussion of the benefits and inherent problems with attempts to connect medical writings to works by lay authors, she cautiously posits that Euripides might have had some exposure to the medical ideas expressed in the Hippocratic works *Breaths, Airs, Waters, Places and Joints*.¹⁵ In such a full discussion of Euripides' medical language, she limits her comments on anatomical terms to a handful.¹⁶

The most recent and sustained study of anatomical vocabulary in Aeschylus, Sophocles, and Euripides is in Guardasole's work on the relationship between Greek medicine and tragedy in the 5th century.¹⁷ Her analysis focuses upon a select number of terms and references within the plays of the three authors. A significant amount of space is spent discussing descriptions of the spine (ἄκανθα, ῥάχις, σφόνδυλος) and spinal marrow (μυελός), which in particular appears to have been a preoccupation of contemporary natural philosophers and physicians. Her discussion of Euripides' use of the adjective νωτιαῖος (*of the back*) to describe the higher vertebral joints

13 Worman 2012 provides another take on Sophocles' representation of the gendered body, emphasizing the abnormality of the bodies displayed on the stage. She argues that the bodies of Sophoclean characters are 'recalcitrant': '[Sophoclean bodies] anchor the dramatic action in modes that are neither wholly male nor wholly female; they are unreadable and intractable, slumped in isolation or stalking outside of the community and of communal norms – including those that aim to enforce clearly defined gender roles' (352).

14 Ceschi 2009: 67-85.

15 Craik 2001a: 87, 90.

16 χέλυς, ἄκανθα, and [κοιλῆ] φλέψ.

17 Guardasole 2000.

(νωτιαία...ἄρθρα) of the spine (σφόνδυλος) at *Electra* 839-42 is especially suggestive of his appropriation of a technical anatomical/medical term:

τοῦ δὲ νεύοντος κάτω
ὄνυχας ἔπ' ἄκρους στὰς κασίγνητος σέθεν
ἔς σφονδύλους ἔπαισε, νωτιαία δὲ
ἔρρηξεν ἄρθρα.

As [Aegisthus] was bending down, [Orestes] stood on his tiptoes, struck him on the spine, and broke the joints of his back.

The adjective appears in tragedy only once in the Classical period, and thereafter in philosophical and medical works.¹⁸ The rest of her study of anatomical parts primarily examines the physiology of generally familiar higher organs such as the heart (καρδία), lungs (πλευμόνα), and liver (ἥπαρ). She has no overarching claims in this section, but rather lets the evidence speak for itself that tragic authors were at times drawing upon contemporary scientific interest in how the body is constructed.¹⁹

Griffith in his article on corporeality in Greek tragedy epitomizes a recent post-modern approach to the tragic/dramatic body, reading it as a complex set of (potentially) polyvalent symbols.²⁰ Crucial to this process is a shared ability of playwright and audience to objectify the body as a 'Ding an sich.'²¹ This consideration of the body as a 'thing-as-such' creates an open

18 E.g. Pl. *Ti.* 77d2, Diogenes Apolloniates fr. 6.22, 25 (but see Harris 1973: 23 for the authenticity of the fragment's wording), and 31 times in the HC (e.g. *Art.* 45, *Gland.* 11.5, *Mochl.* 1.24).

19 The more recent works of Kosak and Holmes are also important contributions to the study of medicine and medical themes in tragedy. Both, however, are concerned primarily with matters other than vocabulary for the human body. Kosak's work focuses on the themes of sickness and health in the plays of Euripides. She argues that Euripides appropriated medical concepts that were alive among his intellectual milieu – specifically the process of identifying a cause to develop a cure – to explore questions about human sickness and suffering. (For a similar notion, see Ferrini 1978.) Physicians were at the forefront of the classical Athenian 'technodrama' of contemporary advancements (195). These modern achievements were especially apt for the tragic stage, since they entailed a three-point relationship of any sickness, established between the disease, doctor and patient. In this structure, the patient, in dialogue with the physician, is as much a part of the cure as the professional. The promise of what physicians could accomplish was great during the 5th century. However, Kosak interprets medical themes in Euripidean plays as illustrating the often seemingly futile effort of humans to overcome their fate. Holmes too chooses to focus on Euripides in her discussion of the body and medicine in tragedy. Her primary interest in this area is Euripides' exploration of cause and agency behind a character's affliction.

20 See Valakas 2002 for a similar interpretation.

21 Griffith 1998: 232.

system in which the barriers between self and other become broken down. This manner of perception is reflected in the application of bodily terms (anthropomorphism) for external things.²² Griffith's discussion is limited in its specific reference to anatomical language and generally focuses on common vocabulary, including some comments on prosaic anatomical words that tragic authors tended to avoid. Among his broad observations of body words in Greek drama is that there is the impetus (a reflection of general Greek habit) to consider the body as a collection of parts. He places special emphasis upon the autonomy of two parts of the body in Greek drama: the womb and the hands.²³ According to Griffith, this general impetus in Greek thought to consider the body as a collection of aggregate parts is exacerbated in tragedy. He further argues that the close link between (Dionysian) tragedy and sacrificial ritual (both defined by violence at some level) naturally encouraged playwrights to focus not just on sacrifice, but on sacrificial dismemberment.²⁴ If this is true, it would provide an explanation for why visceral descriptions of the human body appear in tragedy with far more regularity than in other forms of contemporary literature.

The scholarship on medical language in tragedy, including the more focused studies of anatomical terminology, suggests that dramatists did draw upon technical medical vocabulary. However, with the exception of Griffith – who is not specifically concerned with medical vocabulary – previous scholars interested in medical anatomical words in tragedy have spent little time identifying their place within dramatic speech. Furthermore, these studies have tended

22 Griffith 1998: 246. For example, he mentions ἀύχην (*neck*) = 'isthmus' (LSJ *s.v.* II) and 'bearded pines' (ὄψικομαὶ ἔλαταί), *E. Alc.* 585-86. This concept is more fully developed later (and apparently independently) by Rehm 2002: 168-214 (see esp. 174-75). Part of Rehm's premise is that what happens to a character's body on the tragic stage is symbolic for changes to the *polis* (for example, he cites Xerxes' shabby appearance in *A. Pers.* [1017-23] as 'the physical correlative for his ruined empire,' Pentheus' dismemberment in *E. Bacch.*, and Oedipus' role in the plague of Thebes in *OT*). I illustrate below how this process worked both ways. While external objects became anthropomorphized through metaphor, human parts were likewise labelled using terms for external inanimate objects.

23 Griffith 1998: 234-35.

24 See especially 237-38 for a list of examples where dismemberment and mutilation are described on the tragic stage.

to investigate ancient anatomical terms based on our own classifications, not that followed in the Classical period. By locating terms within a classical medical understanding of the body, I hope to strengthen the argument for the tragedians' use of language for the body that is indeed technical, since it specifically mirrors Hippocratic areas of term creation.

5.2. Creating a strange body: anatomical metaphors in tragedy

Tragic authors used a collection of self-coined and borrowed technical medical terms to supplement preexisting poetic vocabulary when describing the human body. All three sources of speech – poetic, invented, and technical – produce what I call an uncanny verbal body. In the words of the poet Shelley, poetic diction ‘makes familiar objects be as if they were not familiar.’²⁵ The results are often grotesque. I follow Harpham’s definition of the word:²⁶

[The grotesque are] phenomena that both require and defeat definition: they are neither so regular that they settle easily into our categories, nor so unprecedented that we do not recognize them at all; they stand at the margin of consciousness between the known and the unknown, calling into question the adequacy of our ways of organizing the world.

Tragic poets’ recontextualization of the body through uncommon vocabulary (especially metaphorical language) produces this very thing: a grotesque representation of the living body. In doing so, they invite the audience to reflect upon the question τί ἔστιν ἄνθρωπος; (‘what is a human?’). More specifically, do these strange anatomical words accurately represent the body as the audience knows it? Is it their body or something quite different? Uncommon descriptions of a human’s material construction are able to produce a representation of it that challenges us to reconsider what we are and of what we are composed.²⁷ The application of the grotesque to our own bodies is especially provocative, since by living in our own skin we each form a habitual

25 Shelley 1840: 16.

26 Harpham 1982: 3.

27 Cf. Rutherford 2012: 77 on the use of figures of speech in tragedy: ‘Some figures of style seem to be used for defamiliarisation; they are among the means by which the poet distances and even distorts his language, removing it from the everyday.’

image of and familiarity with ourselves that cannot be disturbed without challenging certain fundamental perceptions.

Homeric anatomical vocabulary illustrates early examples of the creation of grotesque bodies in drama. For example, Aeschylus at *Libation Bearers* (458 BCE) uses the poetic term κόρση (*temple*) as the locus for potential suffering, which is further emphasized by the inclusion of disease language. Here Orestes describes to his sister Electra the torments that the oracle said would await him if he fails to avenge the murder of his father Agamemnon. The potential suffering is framed in somatic, pathological, terms (278-82):

τὰ μὲν γὰρ ἐκ γῆς δυσφρόνων μειλίγματα
βροτοῖς πιφάυσκων εἶπε, τὰς δ' αἰνῶν νόσους,
σαρκῶν ἐπαμβατῆρας ἀγρίαις γνάθοις,
λειχῆνας ἐξέσθοντας ἀρχαίαν φύσιν,
λεύκας δὲ κόρσαις τῆιδ' ἐπαντέλλειν νόσῳ,

For [the oracle], making manifest, told to mortals the wrath of ill-disposed forces beneath the earth, telling about the diseases, the protuberances²⁸ of flesh caused by ancient jaws, the sycosis²⁹ eating away the former nature, and leprosy growing on this diseased area of the temples.

There is an uncommon specification of both disease language in this passage and the scientifically charged phrase ‘former/basic nature’ (ἀρχαία φύσις). The phrase is almost certainly scientific, and demonstrably apt in medical writings, since it denotes the natural state of something, usually in opposition to some aberration.³⁰ But along with these medical terms is the

28 ἐπαμβατήρ: *hapax* in surviving Greek literature.

29 An inflammation of the hair follicles, literally ‘growths,’ but probably a technical medical term. A. uses the term elsewhere in his *Oresteia* at *Eum.* 785 and 815. It does not appear in Greek literature outside of the HC before Philo (*De specialibus legibus* 1.80). In the HC it is commonly seen along with descriptions of other skin conditions, including psoriasis (ψώρα), leprosy (λέπρη), and white-leprosy (ἀλφός). See for examples *Aff.* 35, *Prorrh.* 2.43, and *Aph.* 3.20.

30 For example, in Plato’s *Symposium* Aristophanes repeats the phrase several times in his parody of the physician Eryximachus’ medical language: 191d, 192e, 193c, d, and e. It also appears several times in the HC, e.g. *Aēr.* 8, *Art.* 16, *Fract.* 44, *Epid.* 2.1.6 (see Craik 2001b: 111 for a short note on the term’s use by Plato and in the HC). The phrase likewise appears in some fragments of Presocratics, although the reported form of the fragments makes any assignment of exact use by any philosopher problematic.

epic anatomical word κόρρη (*temple*). In the Homeric poems the κόρρη is invariably the location of a spear wound.³¹ In the *Choephoroe* the κόρρη is similarly a vulnerable place, but to the more insidious attack of disease (νόσος).³² This incongruent juxtaposition of provocative pathological and epic language is arresting, yet effectual. The audience is incited to rise to the challenge of comprehending the disparate language and to create a mental reconstruction of the diseased body. Aeschylus' uncommon choice to mention the various skin conditions certainly would have evoked feelings of repulsion.³³ Similarly, the poetic anatomical term κόρρη probably had the same effect of producing an objectified body that was somehow different from one's own. Potentially illustrative of this, again, is the phrase ἀρχαία φύσις 'the former body,' which might have been an oblique reference to the anachronistic 'nature' of the Homeric body.

The following passage from Euripides' *Hippolytus* (428 BCE) illustrates a more nuanced emphasis on the strange corporeality created by the blending of tragic and quasi-technical diction (172-75):

στυγνὸν δ' ὄφρύων νέφος αὐξάνεται·
 τί ποτ' ἐστὶ μαθεῖν ἔραται ψυχῆ,
 τί δεδήληται
 δέμας ἀλλόχροον βασιλείας.

- 31 *Il.* 4.502 (line start), 5.584 and 13.576 (line end, same formula). Aristotle with apparent interest cites Empedocles' use of the phrase ἢ πολλὰ μὲν κόρραι ἀναύχενες ἐβλάστησαν ('many heads sprang without necks') three times: *De anima* 430a29, *De caelo* 300b30-31, and *GA* 722b20. The Attic form κόρρη appears to be limited to the stock phrase ἐπὶ κόρρησιν 'upon the temple' as a location for physical abuse/reprimand (like our phrase 'upside the head'), e.g. Pherecr. fr. 165 K.-A.; Pl. *Grg.* 486c; D. *In Midiam* 72.
- 32 For parallel examples for repulsive physical states in Aeschylus see *Ch.* 1058 for blood flowing from the Erinyes' eyes as they pursue Orestes (κάξ ὀμμάτων στάζουσιν αἶμα). The imagery is repeated at *Eu.* 56, but with fluid (λίβρα) flowing from their eyes. Both instances provide somatic representations of the internal (mental) sickness that the Erinyes bring to Orestes. See Mitchell-Boyask 2008: 28-36 for an excellent overview of the use of νόσος in tragedy. He demonstrates the regular use of disease imagery and metaphor in drama. Mitchell-Boyask's general thesis is that disease became a metaphor to which the audience was especially close after the plague of Athens. It continued to be a living metaphor in drama after the 420s because of the influence of the cult of Asclepius, which arrived in that decade and whose precinct, located close to the theatre of Dionysus, provided a looming physical presence. That the term does not appear in the HC is perhaps due to the presence of the (near) synonym κρόταφος, e.g. *Coac.* 184, *VC* 1, *Loc. Hom.* 3.
- 33 The social stigma attached to such a visible condition is clear, and would have provided additional incentive for Orestes to avenge the death of his father. For the notion that skin disorders were the result of a lack of cleanliness (ἀθεραπεία), see Theophr. *Char.* 19. Theophrastus adds that the δυσχερής, the 'unkempt' man, always claims that his condition is a hereditary disease (συγγενικὰ ἀρρωστήματα).

A cloud of gloom grows upon her brows; my soul desires to know what it is that has spoiled the strange-complexioned body of the queen.

The lines are spoken by the Chorus leader (*coryphaeus*) before the entrance of the queen Phaedra, who is wasting away with forbidden lust for her stepson. The term ὄφρυς (*brow*) was a part of common Athenian speech, but one that also appears in the Homeric epics, Hippocratic writings, and several other genres.³⁴ The Homeric δέμας had strictly poetic use in classical Athens.³⁵ The adjective ἀλλόχροος (*strange-complexioned*) is the most interesting, since it has strong medical connections.³⁶ It appears first in the 5th century BCE and infrequently thereafter until the 3rd century BCE. Euripides uses it twice more to describe the unnatural appearance of a character;³⁷ it also appears once in the Hippocratic text *Internal Affections* (35) in the verbal form ἀλλοχροεῖν (lit. ‘to change skin [-colour]’).³⁸ The word is used later in the Pseudo-Aristotelian *Problems* and Theophrastus’ *On Sense* in descriptions of illness.³⁹

The context suggests that the term’s meaning in *Hippolytus* is also medical, since the nurse in the following line (176) interprets Phaedra’s altered condition as a sign of some disease

34 E.g. *Il.* 9.389, *Od.* 8.86; tragedy: *A. Ch.* 285; *S. Ant.* 528; *E. Alc.* 261; comedy: *Ar. Nu.* 582, *V.* 1088; prose: *Xen. Mem.* 1.4.6; *D. On the False Embassy* 314.6.; *Hp. Aph.* 4.49; *Loc. Hom.* 3; *Morb.* 2.19.

35 E.g. tragedy (frequently): *A. Pers.* 456; *S. Tr.* 945; *E. Or.* 1066; comedy: *A. fr.* 350 Edmonds (only here in Aristophanes); *Pl. Com. fr.* 189 K.-A. The word does not appear in the works of Herodotus, Thucydides, Plato, or Xenophon, nor in any Hippocratic writings.

36 For example, εὐχροος and ἄχροος are common adjectives in the HC used to denote healthy and unhealthy complexions of patients. Εὐχροος / εὐχροία: e.g. *Epid.* 1.2.8, *Prorrh.* 2.24, *Aff.* 58, *Loc. Hom.* 41. The term appears a handful of times outside of the HC before Aristotle, e.g. *Od.* 14.24 (the hide of an ox), *Telecl. fr.* 28 K.-A. in its verbal form εὐχροεῖν, [*Xen.*] *Lac.* 5.8 in a description of the benefits of healthful food.” Ἀχροος: e.g. *Hp. Aër.* 7, *Epid.* 1.1, *Aph.* 5.36, *VC* 19. There is no other attested use of the word before Aristotle, although in the Aristotelian *Problems* there is an illustrative dichotomy drawn between the two states of complexion (967a): Διὰ τί ἡ εὐπνοία εὐχρους ποιεῖ; ἢ ὅτι ἄχροια ἔοικεν εἶναι οἶον σῆψις τις χρωτός; ‘Why is it that ease of breathing produces healthy-complexioned people? Is it because unhealthy complexion seems to be similar to a decay of the skin?’

37 *Andr.* 879, *Ph.* 138.

38 The author here is describing a type of jaundice that causes the skin to change to a pale yellow (ὠχρός) colour. It is possible that Phaedra’s complexion is similar to this, a pale colour, although Euripides might only be suggesting that her colour has changed from its normal state, perhaps becoming flushed. The Hippocratic *Nat. Mul.* begins with the claim that women’s complexions (χρόαι) along with their natures (φύσεις) are secondary only to the divine (τὸ θεῖον) when evaluating causes of sickness.

39 [*Arist.*] *Pr.* 880a25; *Thphr. Sens.* fr. 24 and 50.

(νόσος). This disease imagery is important to her characterization. As Valakas comments: ‘The purpose of *nosos* scenes [in tragedy] seems to be to represent mythical figures discovering their bodily identity and inner state.’⁴⁰ Through the use of different registers, this passage constructs for the audience an incongruous body, one that is both familiar and unfamiliar. First, to her household, Phaedra’s appearance is abnormal in comparison to her previous healthy state; but Euripides also describes her body using terms that are both commonplace and exceptional. In the process he produces a vaguely familiar object that is exposed upon the stage for the audience’s examination.

As we have seen, in the absence of preexisting terms for many of the parts of the new verbally broken body, natural scientists and physicians relied heavily on metaphorical language for their descriptions. An important difference between this coinage of medical terminology and the language of tragedy was how opaque these new terms could be. A newly-coined term in the HC was generally accompanied by some qualifying description or other earmark. Clarity of meaning was necessary if the text was to be comprehensible beyond the author’s close intellectual circle. If a specific term caught on (which it did not always do, as we can infer from Erotian’s and Galen’s glossaries of Hippocratic terms) referential tags would no longer be necessary for those readers within the profession, and the term became part of the technical lexicon.

In drama, however, part of the art was to challenge the audience’s capacity to grasp the meaning of a word when it was used outside of its normal semantic scope. Aristotle takes up the issue of metaphorical language in his *Topics*, a work on how to formulate and to critically

40 Valakas 2002: 84.

evaluate discussions on any given topic.⁴¹ In Book 6, he examines foundations for proper definitions (περὶ τοὺς ὄρους πραγματείας: 139a24), and takes to task an opponent's use of metaphor, claiming that one can 'quibble' (συκοφαντεῖν) with them because they are always obscure (πάν γὰρ ἀσαφές τὸ κατὰ μεταφορὰν εἰπόντα: 139b34-6). Thus someone calling 'knowledge' (ἐπιστήμην) 'unshakable' (ἀμετάπτωτος) or 'temperance' (σωφροσύνη) 'harmony' (συμφωνία) is opening his argument up to attack. Knowledge is not a physical thing, so it obviously cannot be physically manipulated, shaken or otherwise; nor does temperance have anything to do with harmony, since harmony is only possible with sounds. For Aristotle, the use of such metaphors results in a loss of precision and, consequently, weakens someone's argument.

In the following section of his *Topics* (140a3-6), Aristotle extends his argument to include terms that have not come into common vernacular (μὴ κεμένοις ὀνόμασι χρῆται), since uncommon words, like metaphors, are always unclear (πάν γὰρ ἀσαφές τὸ μὴ εἰωθός). For examples of such words he cites three phrases from Plato (whom he mentions by name): 'the brow-shaded eye' (ὄφρυσκίος ὁ ὀφθαλμός), 'the bite-mortifying venomous spider' (τὸ φαλάγγιον σηψιδακές) and 'the bone-engendered marrow' (ὁ μυελὸς ὀστεογενές).⁴² None of these references appear in the surviving works of Plato, which has led Snell to cautiously include them in his collection of tragic fragments as the sole remaining evidence of Plato's

41 As Ross 2005: 9 remarks, the work is 'undoubtedly genuine,' with the possible exception of book 5, which does not concern us here. See Rubinelli 2009: 3-12 for a useful overview of the *Topics*, which appears to be a handbook for his students to use when practising dialectical debates. She dates the work to Aristotle's early career (ca. 360-350 BCE).

42 The 11th century CE commentator on Aristotle, Michael Ephesius, the only other author to use the adjective ὀστεογεν-, remarks that the 5th century poet/philosopher Empedocles previously used the expression ὀστεογενῆ ὁ μυελός (*In libros de partibus animalium commentaria* 29.10, Hayduck).

reported attempts to write tragedy in his youth.⁴³ Accounts of Plato's foray into drama, however, are late, and thus must remain suspect.⁴⁴

Whether or not these words do come from Plato's lost tragedies, comparable ones can be found in the works of the three tragedians. Aeschylus, for example, uses the phrase ὄσπεον στέγαστρον ('cover of the bones') to describe human flesh (fr. 367 Radt); Sophocles mentions the γλώσσης...μυξώδης ἀφρός ('mucus-like foam of the tongue,' fr. 687a Radt); and Euripides describes the ἀκανθώδη ῥάχιν ('thorn-like spine,' fr. 849 Nauck).⁴⁵ In a parody of tragic language from Aristophanes' *Frogs* (405 BCE), Euripides refers to Aeschylus' use of unwieldy utterances (924-6):

ῥήματ' ἄν βόεια δώδεκ' εἶπεν,
ὄφρυς ἔχοντα καὶ λόφους, δεῖν' ἄττα μορμωπά
ἄγνωτα τοῖς θεωμένοις.

[in his play] he would say twelve bullish words [phrases?],
having brow-ridges and manes, and sort of terrible mormyrus-like eyes⁴⁶ unknown
to the audience.⁴⁷

43 Snell 1971: 186. It should be noted, however, that in their present forms only τὸ φαλάγγιον σηψιδακῆς will fit into trimeters that we would expect in tragic speech. Tredennick 1960: 564 suggests that Aristotle is referring to the comic playwright Plato and not to the more familiar philosopher; however, it would seem strange for Aristotle to criticize a comic playwright for his creative word-creation, since this was one of comedy's identifying features. One could expect to see, for example, such jumbled coinages as ψαμμακοσιογάργαρα (*sand-hundred heaps*, Ar. *Ach.* 4) regularly in comedy. To criticize such buffoonery for its lack of clarity seems excessively pedantic, even for Aristotle. There is the further possibility that Plato was using terms in lost philosophical works that Aristotle thought should have remained in Plato's (possible) earlier attempts at poetry. At *Rhetoric* 1406a, for example, Aristotle criticizes the 4th century rhetorician and sophist Alcidas for using such terms as τελεσφόρον (end-accomplishing) and πυρίχρως (fire-coloured), since they seem to be poetical because they are compound terms (πάντα γὰρ ταῦτα ποιητικὰ διὰ τὴν δίπλωσιν φαίνονται).

44 So Swift Riginos 1976: 43-48. Our earliest account of Plato's foray into tragedy in his early adulthood is D.L. *Plato* 3.5-6 (fl. early 3rd century CE): Δικαίαρχος ἐν πρώτῳ Περὶ βίων, καὶ γραφικῆς ἐπιμεληθῆναι καὶ ποιήματα γράψαι, πρῶτον μὲν διθυράμβους, ἔπειτα καὶ μέλη καὶ τραγωδίας. ('Dichaearchus [student of Aristotle, fl. 320-300 BCE] in the first book of *On Lives* wrote that he tried painting and writing poetry, first dithyrambs, then lyric and tragedies.').

45 For the possible medical origins of γλώσσης...μυξώδης see Ceschi 2009: 78-80.

46 The pagellus mormyrus is a type of fish native to the Mediterranean that has large, lidless, eyes. See Dover 1993 *ad loc.* for the conjectured μορμονωπά (bogeyman).

47 See also A. *Nub.* 1366-7: (Strepsiades) ἔγὼ γὰρ Αἰσχύλον νομίζω πρῶτον ἐν ποιηταῖς / ψόφου πλέων, ἀξύστατον, στόμφακα, κρημνοποιόν' ('I consider Aeschylus to be the first among poets in his fullness of [unintelligible] sounds: incoherent, a ranter, a user of rugged words.').

Euripides, however, is not left unscathed in the argument. Aristophanes parodies the tragic poet's diction using medical language, and causes Euripides to say that he has 'squeezed the juice from books' (χυλὸν...ἀπὸ βιβλίων ἀπηθῶν) in the composition of his plays (943).⁴⁸

What is notable from the above references is the similar use of ambiguous and uncommon language. This type of diction, so agree Aristotle and Aristophanes, is generally unclear or unknown to the audience (ἄσαφές, ἄγνωτα). We can infer from this that clarity of meaning, at least at times, was not the end-goal of tragic language. These sentiments are congruent with the common belief in ancient literary criticism that 'big words suit big things and little words little things,'⁴⁹ since 'big words' are generally more opaque than little ones. Tragedians often sought elusive meaning over clear diction. They were creating on the stage an alternate world, just different enough so that contemporary concerns could be mapped upon it without appearing commonplace: hackneyed concepts could be reinvigorated through the use of new vocabulary.

This impetus made tragedy a fitting place for the use of language and ideas that distorted impressions from daily life. In Aristotle's *Poetics*, he prescribes this very type of speech for proper tragic diction (1458a):⁵⁰

Λέξεως δὲ ἀρετὴ σαφὴ καὶ μὴ ταπεινὴ εἶναι. σαφεστάτη μὲν οὖν ἐστὶν ἢ ἐκ τῶν κυρίων ὀνομάτων, ἀλλὰ ταπεινὴ...σεμνὴ δὲ καὶ ἐξαλλάττουσα τὸ ἰδιωτικὸν ἢ τοῖς ξενικοῖς κεχρημένη· ξενικὸν δὲ λέγω γλωτταν καὶ μεταφορὰν καὶ ἐπέκτασιν καὶ πᾶν τὸ παρὰ τὸ κύριον. ἀλλ' ἂν τις ἅπαντα τοιαῦτα ποιήσῃ, ἢ αἰνίγμα ἔσται ἢ βαρβαρισμός· ἂν μὲν οὖν ἐκ μεταφορῶν, αἰνίγμα, ἔαν δὲ ἐκ γλωττῶν, βαρβαρισμός. αἰνίγματός τε γὰρ ἰδέα αὕτη ἐστὶ, τὸ λέγοντα ὑπάρχοντα ἀδύνατα συνάψαι·

The merit of [tragic] diction is to be clear and not commonplace. The clearest diction is that made up of ordinary words, but it is commonplace...That which employs unfamiliar words is dignified and outside of common usage. By "unfamiliar" I mean a rare word, a

48 For discussion of Euripides' medical (but not anatomical) language in lines 940-43, see Dover 1993 *ad loc.*

49 Russell 1981: 6. I discuss the carnivalization of this tendency in the following chapter on comedy.

50 Tr. Fyfe 1973 with minor changes.

metaphor, a lengthening, and anything beyond the ordinary use. But if a poet writes entirely in such words, the result will be either a riddle or jargon; if made up of metaphors, a riddle and if of rare words, jargon [βαρβαρισμός]. By merely combining the ordinary names of things this cannot be done, but it is made possible by combining metaphors.

Aristotle is telling his readers here that the best language for tragedy is to be comprehensible (σαφῆ), while at the same time not pedestrian. Vibrancy is to be sought through the use of strange (ξενικά) terms. It was only when an author used an excessive amount of these that he risked creating something enigmatic or even incomprehensible.⁵¹

Among the class of unfamiliar diction, certainly, were appropriated terms that were primarily in the domain of natural philosophy and medicine. The burgeoning scientific vocabulary during the 5th century was beginning to distance itself from the common vernacular, although many of these scientific terms were metaphors appropriated from common speech. Therefore such language would have been strange but probably still understandable to a more general audience. We also see terms for the body that, although having no counterpart in medical texts, operate on similar principles of formation through metaphor: words for everyday things become appropriated for – or integrated into – the human body. The result is a grotesque representation of it, that while it is vaguely familiar, it is still unsettlingly strange: it is an open body, one that expands (and is ever-expanding) through its relationship with the world beyond the liminal surface of the skin.

In this regard – perhaps above any other – the relationship between the language for the body in drama and in medicine is the closest. Both employed uncommon, provocative, terms for it that encouraged the audience to focus their attention upon their composite parts in new ways.

51 As Halliwell 1987: 161 glosses: '[Aristotle] assumes...that the poet, at any rate if he is a good poet, will always be striving for an essential standard of clarity, and this means that the question of style can be reduced to a matter of the degree and kind of verbal embellishment which will secure a distinctive poetic flavour without detracting unduly from lucidity.'

The results in both were constructions of the body that, through alternate language, did not conform with commonplace impressions. The products are therefore unnatural monsters, insofar as they challenged how the body can be broken apart and reintegrated into a unified thing.

The crucial difference between the language of medical authors and playwrights was the burden of clarity. A medical writer, if he was to be understood correctly by his peers, was required to strive for explicit clarity in his descriptions; it was in everyone's interest for the author to use terms that were either familiar to his audience or adequately defined with the text. The same burden did not necessarily land on the shoulders of tragedians, who had more liberties to use elusive language in their plays.

5.3. The exterior body: the hands and torso

In the following section I examine examples in tragedy where uncommon terms with Hippocratic parallels are used for the external body. Because of a commonly perceived familiarity with the visible body (both someone's own and those of others), it becomes an ideal place for playwrights to challenge traditional notions by presenting a body that, although comprehensible, is nonetheless foreign in some way. In doing so, they create something that arrests the audience's attention, producing something *δεινός*, a thing that is both strange and, as a consequence, potentially quite disturbing. All of these terms appear to be used to emphasize unnatural states of corporeality: the severed hands of children; the monstrous body of deity; the suffering of a hero; and the human body slaughtered like an animal.

5.3.1. κτείς: fingers and knuckle-joints of the hand, A. Ag. 1594

Compared to Sophocles and Euripides, Aeschylus, the earliest of the three tragedians, is sparing in his use of uncommon vocabulary to describe both the external and the internal body. As others have suggested, this is perhaps because medical interest (for my purposes, particularly

interest in the body) had yet to become a popular interest of the elite when Aeschylus was composing most of his plays.⁵² There are, however, a few examples of his use of metaphorical language for the body, which points to a preexisting poetic environment for such terms.

One illustration of this comes from *Agamemnon* (458 BCE) in a passage describing a gruesome cannibalistic meal (1594):

τὰ μὲν ποδῆρη καὶ χερῶν ἄκρους κτένας

the parts about the feet and the outermost ‘combs’ of the hands

These lines are spoken by Aegisthus following his murder of Agamemnon, his paramour’s (Clytemnestra’s) husband and his own cousin. He is here describing the meal his father Thyestes was fed by Agamemnon’s father Atreus: Thyestes’ own sons.⁵³ Aegisthus was just a baby then (according to Aeschylus), and therefore escaped the fate of his brothers.⁵⁴ His murder of Agamemnon was to him justified by the curse his father cast upon Atreus after learning the contents of his meal.

The language for the parts of his children that Thyestes was unknowingly eating is strange, reflecting the unnatural contents of the dish. The text after 1594 is problematic, so it is unclear whether the feet and fingers were set on top of (ἄνωθεν) or apart from (ἄπρωθεν) the

52 E.g. Collinge 1962; Kosak 2004: 12; but for other medical metaphors in Aeschylus (disease, treatment, etc.), see Collard 2008: xlix, Dumortier 1935, and Hogan 1984: 323 (a list of passages that suggest medical language).

53 How many sons were served to Thyestes is a problematic question. Fraenkel 1950 *ad Ag.* 1605 preserves the MS reading of Aegisthus’ claim: τρίτον γὰρ ὄντα μ’ ἐπὶ δέκ’ (‘for me being the third in addition to ten [sc. sons]’), which would mean that twelve of Thyestes’ sons were slaughtered and served to him by Atreus. Fraenkel defends the passage as it stands on the grounds that the large number of deaths increases the horror of the scene. The reading is also supported by Groeneboom 1966 *ad loc* and de La Combe 2001: 740-42 (both drawing parallels with comparatively large numbers of children in other Greek myths); Bowie 2007: 345-46 also appears to accept the MS reading. Page 1957 *ad loc*, however, obelisks ἐπὶ δέκ’, arguing that it is a ‘ludicrous multitude’ of sons killed (followed by Raeburn and Thomas 2011, and Gantz 1993: 549). This would leave Aegisthus as the third son, and mean that two were served to Thyestes. Seneca in his *Thyestes* describes three sons who were butchered (717-43). Aegisthus had yet to be born (see next note).

54 Later versions have Aegisthus as the child of Thyestes and his own daughter in Sikyon after Aegisthus’ brothers were murdered (e.g. Hyginus *Fab.* 88, possibly derived from Sophocles’ fragmentary *Thyestes in Sikyon*). For discussion of this story, see Gantz 1993: 548-49, and Jebb, Headlam, and Pearson 1917: 185-87. For the fragments of Sophocles’ play, see Lloyd-Jones 1996: 107-113.

rest of the flesh that was ‘unmarked’ or unidentifiable (ἄσημα), but that need not hinder our comprehension of this line.⁵⁵ The bodies of Thyestes sons have been mutilated. The hands and feet – the extremities of the body and, apart from the head, the most identifiable features of it – have been estranged both physically and verbally from the whole.⁵⁶

The term χερῶν ἄκρους κτένας or ‘outermost combs of the hands’ is perhaps even stranger. Here Aeschylus is not using a substantive to describe a body part, but rather the metaphor ‘(hair) comb,’ since the bones of the hand appear like a comb’s teeth.⁵⁷ Norri has noted that many languages, including early modern English, have used ‘comb’ as a term for the metacarpus.⁵⁸ Fraenkel agrees with Pollux, who writes that some call the κτεῖς the back side of the hand from the base of the fingers to the tips (that is, the fingers including the connecting-joints [the metacarpophalangeal joints] of the hand).⁵⁹ The connection between the κτεῖς and the upper flat of the hand is quite clear in light of the metaphorical use of ταρσός (*wickerwork*) elsewhere to mean the metatarsal bones of the foot⁶⁰ or the metacarpal bones of the hand,⁶¹ both of which resemble laid wicker. Were we to imagine this part separated from the hand, Fraenkel’s description would indeed appear to be comb-like, the metacarpophalangeal joints and connecting tissue forming the ‘spine’ and the fingers the ‘teeth’ (*fig. 5.1*). Aeschylus is likely not so much

55 For discussions about the proposed lacuna after 1594, see Fraenkel 1950: 752 and Page 1957: 214-15. One reason to suspect a break in the text, Page argues, is that the feet and hands are mentioned at the expense of everything else (e.g. the head).

56 Fraenkel remarks that the term ποδήρη is ‘completely at variance with its ordinary use,’ since in common Greek parlance it was something that extends down to the feet (such a chiton or shield), and calls this deviation from normal use ‘violent,’ which reflects the act itself. For the common use for clothing, see E. Ba. 833 (πέπλοι ποδήρεις); for a full-length shield, Xen. An. 1.8.9 (ποδήρησι ξυλίναις ἀσπίσιν).

57 For the common use of κτεῖς (‘comb’) see for example Pherecr. 106.1 K.-A. Fraenkel rules out Hesychius’ gloss that the term might refer to the καρποὶ χειρῶν or ‘wrists’ of the hands, since these have no clear visual metaphorical connection to a comb: κτένας· τοὺς τῶν χειρῶν καρπούς καὶ τῶν ποδῶν (‘combs: the connecting joints of the hands and feet’).

58 Norri 1998: 129.

59 Pollux 2.144: ἔνιοι δὲ τὸ μὲν πρόσθιον τῆς δρακὸς πᾶν θέναρ οἴονται καλεῖσθαι...τὸ δὲ ἀντικείμενον πᾶν ὀπισθέναρ ἢ κτένας (‘some think that the whole front side of the palm is called the *thenar*, while the opposite side is called the reverse-*thenar* or the *ktenas*’).

60 E.g. Il. 11.377, Hdt. 9.37, Hp. Fract. 9.

61 E.g. Ruf. Onom. 82, Sor. Fract. 22.

concerned with osteology here, the underlying skeletal structure of the hand, as he is with modelling the striking and chilling aspect of severed fingers that become something inanimate: a comb.

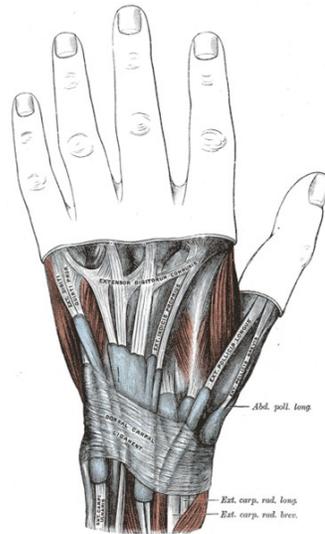


Fig. 5.1: Exterior and interior views of hand
(Gray's Anatomy 1918, fig. 424)

Aeschylus' use of the term κτείς as an anatomical metaphor does not appear elsewhere in classical Greek writings outside of the HC, which suggests some shared understanding of term creation. In a handful of places in these medical works it is used to as a euphemism for the pubic region of both genders. An epitome of its use appears at *Aphorisms* 7.39:⁶²

Ἦν οὐρέη αἷμα καὶ θρόμβους, καὶ στραγγουρή ἔχη, καὶ ὀδύνη ἐμπίπτῃ ἐς τὸν περίνεον καὶ τὸν κτένα, τὰ περὶ τὴν κύστιν νοσέειν σημαίνει.

If [the patient] should urinate blood and clots, suffer from strangury,⁶³ and the pain travels toward the perineum and the 'comb' [the genitals], it suggests that the parts around the bladder are diseased.

Although the word is never used by the Hippocratics in the sense that Aeschylus employs it, the application of the term in an anatomical sense similarly depersonalizes a part of the body through a metaphorical connection to a common domestic object. We can presume that both a

62 For use of the term in the HC, see further Skoda 1988: 156-57.

63 Either an obstruction or irritation of the bladder.

reader and audience member would be immediately familiar with the appearance of a comb. It would then be easy to infer or to overlap the hair comb's structure upon the body part to which it is implicitly compared. The parts under consideration become linguistically and potentially conceptually altered, but in a way that does not entirely estrange them from their once-animate sources: the children of Thyestes.

5.3.2. The torso: κύτος, θώραξ, χέλυς

There are three particular instances in Greek tragedy when the human torso is also described in words that point more strongly to medical influences. The first example is from Sophocles' *Women of Trachis*; the other two are from Euripides' *Heracles* and *Electra*. Similar to Aeschylus' description of the fingers as a 'comb,' these metaphorical terms for the torso encourage an audience to think differently about the body. Beyond this, the three examples below illustrate that there is likely another factor involved: the terms used emphasize the image of the body as a container, something that physicians were particularly interested in at that time. The tragedians, like their contemporary physicians, invite a contrast between our accessible exterior surface and our interior, hidden, and vulnerable parts.⁶⁴ The body's construction therefore becomes an object of special enquiry where dichotomies between inside and outside and human and non-human can be explored.

⁶⁴ It is possible to connect this notion to Hillman 2007, who through the works of Shakespeare argues for an increasing awareness and discomfort between our inner and outer selves during the 17th century. Following the work of Norbert Elias, Hillman argues for a growing tendency in Shakespearean England to understand our material construction as a *homo clausus*, or 'enclosed human.' We as enclosed beings are concerned about what (and metaphorically who) is let in or out of our bodies. Hillman's work is heavily influenced by psychoanalytical understandings of the self. Saunders 2008: 99 (citing Aers 1992) has refuted Hillman's argument that this concept arose in the early modern period, since it appears to have been around for far longer than this. In his opinion Hillman's investigation would have worked better were he to have favoured a synchronic approach rather than diachronic.

ἀνδρείῳ κύτει⁶⁵ / βούπρωρος

ox-faced with a human cavity

At the outset of *Women of Trachis*,⁶⁶ Deianeira describes her lamentable betrothal to the river god Achelous. Just like the better-known sea god Proteus, Achelous was able to manipulate his form because of his fluid constitution. Among these forms of Achelous, Deianeira tells us, was that of a bull, a serpent, and a being with the face of an ox and the ‘cavity’ of a human (in other words, the torso). The unusual metaphorical vocabulary in the passage underlines the monstrous nature of the deity.

The term κύτος is the important anatomical term in this passage, and perhaps represents an early influence of medical terminology upon tragic diction. At the very least, it is congruent with classical medical approaches to the body. In its primary sense, it denotes a hollow part of something, such as that of a shield (e.g. *A. Th.* 489: κύκλος) or of a dish (e.g. *Pl. Com.* 189: λοπάς). It is also regularly used as a substantive for a vessel or jar (e.g. *A. Ag.* 322; *S. El.* 473). By further extension, it is used in *Women of Trachis* (but only here in tragedy) to mean the trunk of the human body, preserving the strong overtones of it being something with capacity. In this context we can imagine the contents to be fluid, following the natural (or unnatural?) form of the deity. As we have seen, medical writers in particular were also interested in the torso as a

65 Kamerbeek 1970 (*ad loc.*) argues for the ms. reading τύπω (form), but admits that both readings are perhaps very old. I side with Easterling 1982 (*ad loc.*), however, who retains κύτει (a reading preserved at Strabo 10.458) on the basis that the imagery is less vague than ‘form’ and on the apparent reliability of Strabo’s ‘specific’ or focused quotation (Achelous’ transformation is the point under discussion).

66 The dating of *Women of Trachis* has been a contentious issue in Sophoclean scholarship. There is no internal or external evidence to give a clear picture of the possible year of production; however, I accept Easterling 1982: 23, who suggests a range between 457-430 BCE (see further Hoey 1979, who places it about 450 BCE in the earlier period of Sophocles’ plays). Mitchell-Boyask 2008 ch. 6 suggests a possible later date, between 430-425 BCE, placing it shortly after the plague of Athens (430/29 BCE). Whether or not we accept this, Mitchell-Boyask makes a strong case for the similarity of disease language, especially between Thucydides’ description of the plague (2.49) and the effects of the Centaur’s poison on Heracles (e.g. 767, 770, 1053-55).

container for fluids. Both the sense of the term – a container for the internal parts and fluids – and uses of it in a medical context point to a possible technical origin.

This specific anatomical use of κύτος first occurs here in *Women of Trachis*. Later, the term appears regularly in, and mostly limited to, the technical biological writings of Plato and Aristotle to describe a body part's capacity. In Plato, references are restricted to his last works, *Timaeus* and *Laws*.⁶⁷ He uses the term generally for the body as a container for the soul⁶⁸ (*Ti.* 44a6), and more specifically for the cavity of the skull (*Ti.* 45a7). The most usual meaning, like Sophocles', is the human torso (*Ti.* 67a4):

τὸ κύτος ἅπαν, ὅσον ἡμῶν μεταξύ κορυφῆς τοῦ τε ὀμφαλοῦ κείται

the entire cavity, the part which lies between our head and navel

This use of the metaphor becomes prevalent in Aristotle's biological writings when referring to the torso (*HA* 491a29).⁶⁹

τὸ ἀπ' αὐχένος μέχρι αἰδοίων κύτος, ὃ καλεῖται θώραξ

the cavity from the neck to the groin, which is called the *thorax*

The use of κύτος in these above contexts encourages implicitly or explicitly an image of the torso as a container. Within this packed concept is the understanding that the body is not so simple as it appears from the surface. Achelous' body is a container, but what does it contain? It is malleable, taking on a number of different forms, so is it different from ours? What is inside us? The body of Achelous is especially apt for such (literal) introspection, since his status as a god with transformative powers makes him unnatural, a monster. Likewise, our own internal

67 *Timaeus* seven times: 44a6, 45a7, 67a4, 69e6, 74a3, 78c2, 78d1; *Laws* once: 963e1.

68 Cf. [Hp.] *Anat.* 1.10 and *Cord.* 7.6 where the body is described as the tabernacle (σκῆνος) of the soul.

69 Aristotle, however, still uses the term more generally to refer to any hollow within a body. E.g. the paunch (τὸ περὶ τὴν γαστέρα κύτος, 'the hollow around the belly' *GA* 720a35).

parts, once exposed to examination, appear unnatural. Whether or not the audience was expected to reflect for so long upon the word, its unusual and limited use in an anatomical sense makes it an effective term to encourage one to think about the body.

θώραξ: upper-chest, E. *HF* 1095 and Ar. *V*. 1190-96

ἰδού, τί δεσμοῖς ναῦς ὅπως ὠρμισμένος
νεανίαν θώρακα καὶ βραχίονα
πρὸς ἡμιθραύστῳ λαίνῳ τυκίσματι
ἡμαί, νεκροῖσι γείτονας θάκους ἔχων

Behold! Why am I, like a ship anchored with moorings, sitting with my strong chest and arms tied to half-broken masonry, and sit with corpses for neighbours?

These are Heracles' lines who, after being driven mad by Hera, kills his wife and three sons.⁷⁰

After the murders Athena causes Heracles to fall asleep, preventing him from also killing

Amphitryon. He is then tied to the masonry to prevent him from committing any further harm.

This passage illustrates his mental process as he is trying to reconstruct his current surroundings and recent history. He starts with his own corporeality. It is his means of life and only interface with the exterior world. Heracles appears to be checking his own present state – performing a mental and physical reorientation – before moving on to his inanimate surroundings. While doing this, he discovers to his surprise that his body itself seems unnatural (1089-93):

ἔμπνους μὲν εἶμι καὶ δέδορχ' ἄπερ με δεῖ,
αἰθέρα τε καὶ γῆν τόξα θ' ἡλίου τάδε·
ὥς δ' ἐν κλύδωνι καὶ φρενῶν ταραγμάτι
πέπτωκα δεινῶι καὶ πνοᾶς θερμᾶς πνέω
μετάρσι' οὐ βέβαια πλευμόνων ἄπο.

I am still breathing, and I see all that I should: the sky, the land, and these shafts of light from the sun. But as in rough water, I have fallen into a terrible disturbance of my soul [midriff] and I breathe hot breath; unsteady air comes from my lungs.

70 See Bond 1981: xxxi for the dating of *Heracles* to either 416 or 414 BCE.

Heracles immediately realizes that things are not right. The external world appears fine – he sees the expected sky, earth, and sun – but his internal world seems abnormal: his midriff/soul (φρένες) is disturbed⁷¹ and his lungs (πλευμόνες) pant hot breath. Heracles is disturbed by this disharmony of the ordered exterior world and his chaotic interior. In order to make sense of this incongruity, he extends his attention to the surface of his body as the point of mediation between the open world and the enclosed body. His chest (θώραξ) and arms (βραχίονες) are constrained, an unnatural situation for the Greek paragon of physical strength, thus confirming his suspicions that something is wrong with him.⁷² His call for help to correct this is framed in an explicitly medical context (1106-8):

ὦή, τίς ἐγγύς ἢ πρόσω φίλων ἐμῶν,
 δύσγνοιαν ὅστις τὴν ἐμὴν ἰάσεται;
 σαφῶς γὰρ οὐδὲν οἶδα τῶν εἰωθότων.

Hello! What friend of mine is near, who can treat my ignorance? For I do not even know common things clearly.

Heracles has been the focus of two relatively recent works on the intersection of tragedy and medicine, primarily because of its emphasis upon the identification of the cause of a disorder by its symptoms, and the common latency of both.⁷³ It is the potential for diseases hidden within the body that makes tragedy so accommodating to medical ideas. As Holmes points out, tragedy unlike epic portrays violence that is out of sight of the spectators: corpses represent the ‘coming to light’ of violence after the fact, while symptoms suggest the coming to be of ‘the unseen attack as it unfolds.’⁷⁴

71 The double meaning of the term φρένες is probably invited here.

72 As Holmes 2008: 263 writes: ‘Even as he recognizes the sun, the heavens, and the earth, he continues to experience his “vigorous chest and arms”...now bound, as something uncanny.’ Her use of the term ‘uncanny’ is especially notable for our current discussion; Heracles’ uncommon choice of words when describing his body mirrors his unnatural physical and mental states.

73 Kosak 2004, esp. ch. 3; Holmes 2008.

74 Holmes 2008: 241-42. For further discussions of Heracles’ ‘disease,’ see Filhol 1989 and von Staden 1992a.

Given the pathological context of this passage, it makes sense that there are references to his internal state (agitated *phrenes*, his laboured breathing). These parts are secretly hidden within the chest cavity – Sophocles’ κύτος above – but here called the θώραξ. Holmes’ claim about the role of the body in the play is worth citing in full:⁷⁵

In *Heracles*, some of the major tenets of medical and ethical perspectives on human nature form part of the imaginative world in which Heracles’ vulnerability takes on meaning. These include a strong sense of the inner body as hidden, daemonic space, the concept of a causal chain in which the body (or an analogically imagined soul) becomes complicit in the production of the symptom, and the importance of the unfortunate encounter as a catalyst for disaster.

Sophocles’ use of θώραξ draws particular attention to this discomfort with the interior of the body. Like a breastplate, it both contains and protects our unseen insides and separates our life-sustaining parts from the exterior world. Although the imagery likely would have been clear to the audience, the use of the inanimate object as a metaphor serves to depersonalize the hero’s body. Heracles objectifies his somatic experiences and invites the audience to approach his internal suffering in the same way. This objectification potentially further complicates Heracles’ agency in the murder of his children. His body, which was directly responsible for this horrific act of violence, is framed as something disconcertingly foreign that, although his, is not him.

There is strong evidence to suggest that θώραξ originated from technical medical vernacular.⁷⁶ The term properly refers to a hero’s breastplate,⁷⁷ and thus becomes applied to the area which it covers, the upper torso. The word is used often within in the HC to refer to the

75 Holmes 2008: 273. Cf. Segal 1985: 12: ‘...the sense of the body is one of the most powerful ways in which these tragic poets bring home to us the actuality of the suffering that is the subject of their plays. We must recall too that in drama the issues are quite literally embodied in the physical presence of the solid, corporeal figures moving before us in three dimensions in the orchestra.’

76 Bond 1981 (*ad loc.*) does not mark it as technical, but comments on its (possible) singular use here in tragedy: ‘trunk: possibly used at *Ion* 993; otherwise not in tragedy.’

77 E.g. *Il.* 11.19: δεύτερον αὖ θώρακα περὶ στήθεσσιν ἔδυνε ‘next he placed his *thorax* around his breast.’

chest.⁷⁸ It is further marked as a likely technical term at *The Art* (10) by the presence of καλέομενος ‘the so-called’: ὁ...θώραξ καλέομενος, ἐν ᾧ τὸ ἥπαρ στεγάζεται...κτλ. ‘the so-called *thorax*, in which the liver is concealed.’ We see a similar marking of the term by Plato (*Ti.* 69e):

ἐν δὲ τοῖς στήθεσιν καὶ τῷ καλουμένῳ θώρακι τὸ τῆς ψυχῆς θνητὸν γένος ἐνέδουν

There is the need for a mortal class of soul in the breast and in the so-called *thorax*

The use of this word in the above biological and medical context, earmarked by the qualifier ‘so-called’ (καλεῖται), provides strong evidence that this term for hoplite armour took on a secondary medical meaning in Athens.

Further support for the use of θώραξ among the intellectual elite of Athens is suggested in Aristophanes’ *Wasps* (422 BCE). Here, however, we see the potential ambiguity of the term among those who were unfamiliar with medical vocabulary (1190-96):

(Bd.) ἀλλ’ οὔν λέγειν χρή σ’ ὡς ἐμάχετό γ’ αὐτίκα
 Ἐφουδίων παγκράτιον Ἀσκώνδα καλῶς,
 ἤδη γέροντων ὦν καὶ πολιός, ἔχων δέ τοι
 πλευρὰν βαθυτάτην χήρακλειαν λαγόνα καὶ
θώρακ’ ἄριστον.
 Φι. παῦε παῦ’, οὐδὲν λέγεις.
 πῶς ἂν μαχέσαιτο παγκράτιον θώρακ’ ἔχων;
 Bd. οὕτω διηγέισθαι νομίζουσ’ οἱ σοφοί.

(Bdelycleon) So, then, you must say how Ephudion for example fought well in the pancration against Ascondas. Despite being old and grey, he had – I’ll tell you – thick sides, strong flanks, and the most excellent *thorax*.

Philocleon: Stop, stop! You’re speaking nonsense! How could he fight in the pancration wearing a breastplate [*thorax*]?

Bd.: Well, that’s how the smart people are accustomed to describe it.

78 E.g. *VM* 22 in contrast to the bowels (κοιλίη); at *Acut.* 25 it is located above the midriff (φρένες). Hence the English term ‘thorax’ and its adjectival form ‘thoracic,’ which refer either to the chest or to the trunk of the body (Scarborough 1992: 9).

Bdelycleon is here trying to convince his elderly father Philocleon that he is not too old to adopt a youthful spirit. He uses the example of the apparently ageing pancration fighter Ephudion, who was still in good physical condition. The pancration was similar to our modern day Olympic wrestling blended with boxing (kicking might also have been involved).⁷⁹ Both contestants would be entirely nude, hence Philocleon's surprise at hearing that Ephudion was wearing a breastplate (a very unfair tactic in a wrestling/boxing match!). Bdelycleon then informs his father that the term *thorax* is used by 'smart people' (οἱ σοφοί) to refer to, as we can infer from the passage, the upper torso of the fighter.⁸⁰

That θώραξ was used by educated people for this part of the body provides further evidence that there was at this time something approaching a technical vocabulary for some parts of the body, if by 'technical' we mean a term limited to a specific group within a society. The application of the metaphor is certainly jargon (Aristotle's βαρβαρισμός), for the older Philocleon mistakes the use of the word for the more common meaning. Although the passage gives no context for the original profession or group that created the meaning for this term, it is quite likely that it had its strongest currency among the medical community.

χέλυς: upper-chest/ribcage, E. *El.* 837

The final example of exceptional vocabulary for the torso is found in Euripides' *Electra*. Here, the term χέλυς appears to obscure the boundaries between human and animal bodies.⁸¹

οἴσει τις ἡμῖν κοπίδ' ἀναρρήξαι χέλυ

⁷⁹ See Gardiner 1906 for a detailed description of the pancration contest.

⁸⁰ MacDowell 1971 (*ad loc.*) writes: 'θώραξ in the sense "chest" or "torso" was an anatomical term, not yet in general use.' He is right in rejecting the unnecessary claim of Starkie 1968 (*ad loc.*) that Philocleon is understanding the term in the 'convivial sense,' citing the verb θωρήξομαι (to fortify one's self with drink) at *Ach.* 1133-35. MacDowell counters that armour would be more out of place in the pancration than alcohol.

⁸¹ The date of the play is uncertain, but ranges between 422-413 BCE has been argued (see Roisman and Luschign 2012: 28-32). Based on frequency of metrical resolutions, one short or one long syllable replaced by two shorts, Cropp and Fick 1985: 1-3 have proposed a composition date between *Suppliants* (424-420) and *Heracles* (417-16).

someone bring me a Thessalian axe to split the chest

These are Orestes' words, reported by a messenger,⁸² after Aegisthus, the murderer of his father, has examined the liver of a sacrificed calf. Aegisthus interprets the parts of the organ as a bad sign of treachery from abroad, specifically Orestes whom he does not recognize. Orestes alleviates Aegisthus' concerns by saying that as king of Mycenae he has nothing to fear from an exile. Orestes then asks for the Thessalian axe to cut open the χέλυς or chest cavity (lit. 'tortoise shell') of the calf that would have been split at the breast bone,⁸³ but turns the axe on Aegisthus' back (839-42):⁸⁴

τοῦ δὲ νεύοντος κάτω
ὄνυχας ἔπ' ἄκρους στὰς κασίγνητος σέθεν
ἔς σφονδύλους ἔπαισε, νωπιαῖα δὲ
ἔρρηξεν ἄρθρα·

While [Aegisthus] was kneeling down, your brother [Orestes] struck him upon the spine, splitting his back joints.

Although χέλυς is specifically referring to the sacrificial calf, from a lexical position, its chest might as well be Aegisthus'; so too, his split spine (σφόνδυλος)⁸⁵ and joints (ἄρθρα)⁸⁶ could just

82 Provocative descriptions and vocabulary (as well as colloquial language) in tragedy are often restricted to messenger speeches, which are considered to be to an extent separated from the main dramatic material of the play. This may account for the apparently uncommon and 'untragic' language for the human body here. See Craik 2002: 89-93. Craik argues that the messenger speech in *S. Ant.* 1192-1243 might contain both erotic and (more cautiously) medical language that is not entirely appropriate for the principal characters of the tragedy to utter. For example, she cites the description of Haemon's bloody eyes (1238-39): καὶ φυσίων ὄξειαν ἐκβάλλει ῥοήν / λευκῆ παρειᾷ φοινίου σταλάγμος ('And while gasping he expelled an acrid flow of dripping gore down his white cheek'). She suggests that the adjective ὄξεια (*acrid*) might have medical connotations, since it is used by medical authors to describe bodily fluids, especially bile (χολή).

83 Straten 1995: 117 describes the process after the sacrificial kill: 'the thoracic (and abdominal?) cavity of the carcass is rather carefully opened up with a lengthwise incision, and...some of the inner organs are extracted.'

84 See Porter 1990, esp. 257-60 for discussion of Orestes' brutality in slaying the 'disconcertingly polite' Aegisthus in such a way, which is likely intended to show the unvarnished reality of vengeance killing.

85 Guardasole 2000: 90 observes in passing that the term σφόνδυλος (*vertebra*) appears already in Homer (*Il.* 20.483: σφονδύλιον), and is seen widely (*ampiamente attestato*) in both medical and non-medical writings in the 5th century. But in fact, outside of medical or biological writings, the term appears only five times in Greek literature and only in drama (E. *Phoen.* 1413 (in a description of the death of Polynices; see below), Pherecr. fr. 1 (Meinike), and in Ar. *V.* 1489 and *Pax* 1077). The most regular appearance of this word is found in the HC (but σπονδύλος: e.g. *Art.* 43, *Epid.* 2.2.24, *Prorrh.* 1.87, *Loc. Hom.* 10).

86 See section 4.4.2 on bones below for discussion of this term.

as easily be the animal's.⁸⁷ By confusing the parts, Euripides in effect distracts them from their context. In this way neither the calf nor Aegisthus can claim sole proprietorship of the things within their bodies. The product is monstrous, since the terms are estranged from their proper referents. Both descriptions of the parts and the bodies to which they are associated are delivered through the mediation of the messenger, and thus both the slaughtered Aegisthus and the calf are hidden from the audience who is left to try to mentally assemble their abstracted pieces.⁸⁸

The use of χέλυς in this passage does not seem to have given commentators much pause.⁸⁹ The word is used properly for a tortoise shell (e.g. *h.Merc.* 33), and by extension is also used in poetical language for a lyre (λύρα).⁹⁰ Notably, the only other appearance of this word in the sense of the chest is in the Hippocratic treatise *Anatomy* (1):

Αὐτὸς δὲ ὁ πνεύμων συνεξαναπληροῖ τὴν χέλυα

The lung itself [opposed to the trachea] fills the shell [i.e. 'ribcage']

Anatomy, the shortest work contained in the HC, is an outline of the contents of the higher torso, including the lungs, heart, liver, kidneys, and the connecting vessels and channels.⁹¹ It perhaps draws upon comparative anatomy for its description of the body. The work appears only in one manuscript (V), and is not mentioned by any ancient author, including Galen and Erotian. This and the detailed description of human anatomy, suggesting human dissections, has led Jouanna to

87 See Porter 1990: 255-60 for Euripides' unheroic characterization of Orestes as a butcher of Aegisthus in his version.

88 For a similar reading of Euripides' verbal fragmentation and decontextualization of the body, see Zeitlin 1991 on *Hecuba*, especially her comments on p. 78 about lines 836-40 *et passim*: 'The coherency of the body's [verbal] form dissolves and yet reunites, gathering force and intensity along the way. To divide is also to multiply, and the singular would become a plural to put irresistible pressure on the other's body.'

89 Denniston 1939 *ad loc.* mentions it only once in a note on punctuation.

90 For a description of the instrument and the use of χέλυς to describe it, see Bélis 1995: 1027. For χέλυς as a musical instrument in tragedy, see A. fr. 314 Radt and E. *Alc.* 447.

91 See Craik 1998b: 119-20 for a good summary of the work.

date the work to the Hellenistic or Roman periods.⁹² However, while not committing to a specific date, both Craik and Potter have identified peculiar vocabulary in this work similar to that of the Presocratics. Craik in particular posits that the work might be as early as the 4th century BCE. There is, then, a good possibility that this work reflects earlier 5th-century writings and vocabulary for human anatomy, which may have been part of the intellectual milieu of Euripides' Athens. In any case, the same referent for the metaphorical use of χέλυς, the ribcage, in both *Electra* and *Anatomy* suggests some shared understanding of anatomy and anatomical term creation. Craik suggests that χέλυς may be a Coan veterinarian term applied to the human body in *Anatomy*.⁹³ We do, however, have a parallel example in *Places in Humans* where a similar metaphor of an instrument, the *kithyra* (κίθαρος), is used to describe the torso.⁹⁴

The strange metaphorical application of χέλυς – a rare term for either humans or animals in surviving literature – enhances the grotesque and confused imagery in this scene. The slaughtered bodies of Aegisthus and the calf become blended, and the calf momentarily becomes a proxy for Orestes' intended victim. This quasi-medical word is ambiguous enough for the audience to be uncertain about Aegisthus' fate once the axe falls: whose body is being struck? However, it soon becomes clear, in a way that emphasizes the viciousness of the act, that Orestes has indeed taken revenge on his mother's paramour.

92 Jouanna 1999: 375. Craik 2006c: 155-56, however, argues that the brevity of the work might have discouraged its inclusion into such works as Erotian's (1st century AD) glossary. She further posits that *Anatomy* might have been examined in Galen's now lost writings on Hippocratic anatomy.

93 Craik 2001a: 89, arguing against Buck's position that it is a local dialectical variant (Buck 1955: 144).

94 The liberal use of the term in this work (3.36; 10.3, 4, 10; and 14.1, 28, 30, 48) suggests that its meaning was familiar to the author's intellectual circle. Craik 1998a: 113 cites the glosses of Erotian K 27 (παρὰ Δωριεῦσιν οὕτως ὁ θώραξ καλεῖται, '[the *kithyros*]: the chest is so-called among the Dorians') and Galen 19.111 K (κίθαρον· θώραξ, '*kithyros*: chest'), arguing that the use of Doric terms might point to a Doric source. She points out (following Skoda 1988: 24-25) that the term was probably used in veterinarian terminology.

5.4. The internal body: ‘channels’ and bones

Descriptions of internal anatomy served as other ways to emphasize suffering of characters and to problematize common ideas about the construction of human body. In many cases, tragedians used general Homeric language that only suggests the various contents of the human body;⁹⁵ however, Aeschylus, Sophocles, and Euripides also all mention the major organs above the diaphragm (φρένες), including the heart (καρδία),⁹⁶ lungs (πλεύμονες / πνεύμονες),⁹⁷ and liver (ἥπαρ).⁹⁸ Since they were already part of Homeric vocabulary, these words were already sanctioned as part of the stock poetic language. Further evidence for tragedians’ adherence to Homeric anatomical vocabulary is the absence of some words. For example, two organs that do not appear in the Homeric poems are also never mentioned by the tragedians: the kidneys (νεφροί) and the spleen (σπλήν). Both, however, do appear elsewhere in classical comedy and prose, which shows that other Athenian writers were aware of these individual parts.⁹⁹

On those occasions when tragedians did describe internal parts differently from the Homeric poems, it was certainly with dramatic effect. Here we find them especially interested in similar parts as the Hippocratics: those that contained or carried fluids and air. Aeschylus, the oldest of the three tragedians, is particularly tacit about these internal parts; however, later

95 E.g. σπλάγγνα: A. *Sept.* 1031 (the womb), *Eum.* 249 (possibly the lungs: φυσιᾶι / σπλάγγνον); S. *Ant.* 1066 (womb), S. *Aj.* 995 (the source of grief); E. *Supp.* 212 (haruspicy), *Hipp.* 118 (site of pride); ἔντερα: A. *Ag.* 1221 (bowels, contrasted with σπλάγγνα).

96 Only mentioned with a psychological sense, e.g. A. *Pers.* 161, *Supp.* 349, *Ag.* 1028; S. *OT* 666, *Ant.* 88, *Tr.* 651; E. *Hec.* 1129, *IT* 344, *Or.* 466.

97 Mainly used to describe either respiration or the location of an injury. Respiration: A. fr. 177a Radt, *Sept.* 61 (of horses); S. fr. 941 and 1135 Radt; E. *HF* 1093 (Heracles’ laboured breathing); injury: A. *Ch.* 639 (sword to the lungs); S. *Tr.* 567 and 778 (an arrow to the centaur Nessus’ lungs), *Tr.* 1054 (the poison of Nessus affecting Heracles’ lungs); E. *Ion* 524 and 767 (an arrow to the lungs [767 a metaphor for pangs of grief]).

98 Used in both a psychological and an anatomical sense, but mainly with the latter meaning. Psychological: e.g. A. *Ch.* 272; S. *Aj.* 938, *Ph.* 929; E. *Hipp.* 1070 (metaphorical [emotional] wound to the liver), *Supp.* 599; anatomical: e.g. A. *Pr.* 1025 (of Prometheus, notably described as κελαινόχροτον ‘black-coloured,’ because of its concentration of blood); S. *Tr.* 931 (Deinaira’s suicide by sword), *Ant.* 1315 (Antigone’s suicide by sword); E. *HF* 977 and 1149 (Heracles’ slaying of his son); E. *IT* 1327 (battle injuries of the Hellenes), *Hel.* 983 (Menelaus’ threat of suicide).

99 E.g. νεφροί: Ar. *Lys.* 962, *Ra.* 475; Pl. *Ti.* 91a5 (cf. νεφρίτις, ‘kidney sickness,’ Th. 7.15.1); σπλήν: Hdt. 2.47; Ar. *Th.* 3, Antiph. fr. 221 K.-A., Pl. *Ti.* 72c6.

tragedies of Sophocles and Euripides contain several examples. Concealed parts of characters – and sometimes those of animals – are commonly named in close succession. This intensifies the abstraction of the described body from its normal, unbroken, state. The result, as with strange descriptions of the human exterior, was the display of something unnatural, if not entirely new to the audience.

5.4.1. Channels: φλέψ, κοίλη φλέψ, σῦριγξ, πύλαι, ἄρτηρία

It is perhaps best to consider tragic anatomical terms for ‘channels’ together, rather than classifying various internal passageways by their various modern functions (i.e. their conveyance of specific fluids and air within the body). In this way we follow the more common Greek conventions for grouping these parts. The author of the Hippocratic *Traditional Medicine* for example identifies the ‘elongated’ (τὰ...ἐκπεπταμένα) structures within the body through which general fluids (χύμα) travel to ‘hollow’ parts (κοίλα) that receive the different fluids (22). It appears that the tragedians accepted a similar model. Sophocles and Euripides seem to have been interested in channels. As we shall see, they are often mentioned at climactic moments of pain (both physical and mental). The uncommon vocabulary emphasizes a character’s unnatural state. These parts, which normally remain intact and hidden within the body, are usually described using metaphors derived from inanimate tubes and passages. Thus the imagery of the unrestricted flow of the body’s life-sustaining contents is heightened.

φλέψ, A. fr. 230 Radt; S. Ph. 825

The Homeric term φλέψ (*Il.* 13.546, *hapax* in the poems) is used once by each of the three tragedians. The word itself is non-technical, although as we have seen in chapter 3, Hippocratic writers were quite concerned with identifying and tracing them within the body. In each instance of its appearance in tragedies, φλέψ is associated with blood; it was therefore one of the few

terms for channels that was associated with a specific physiological function. Aeschylus provides what might be our earliest example of the word in surviving tragedy (fr. 230 Radt):

σοὶ δ' οὐκ ἔνεστι κῆκυς οὐδ' αἰμόρρυτοι
φλέβες

You have neither strength nor blood-flowing vessels in you.

Unfortunately, the fragment gives us little context. The appearance of φλέψ in Sophocles' *Philoctetes* (409 BCE) give us more: this is a work in which physical sickness, Philoctetes' diseased foot (the result of snake bite), is at the forefront.¹⁰⁰ Neoptolemus describes the hero's terrible suffering (823-25):¹⁰¹

ἰδρώς γέ τοί νιν πᾶν καταστάζει δέμας,
μέλαινά τ' ἄκρου τις παρέρρωγεν ποδὸς
αἰμορραγῆς φλέψ.

Sweat covers his whole body, and a dark freely-bleeding vein has opened on his heel.

In both Aeschylus and Sophocles, φλέψ is used with an adjective that describes it as containing blood (αἰμόρρυτοι/αἰμορραγῆς), which shows an awareness of the channel's function. The inclusion of the adjectives appears to be their opportunity to embellish upon the Homeric term.

In classical writings, Aeschylus' αἰμόρρυτοι appears once elsewhere, in Euripides' *Helen* in an oath Helen makes under threat of having her throat cut (355). Sophocles' αἰμορραγῆς, though, has received attention for having close connections with Hippocratic language.¹⁰² The term appears only here and frequently in Hippocratic writings before

100 For a useful starting point for discussions of Philoctetes' suffering in the play, see Schein 2013: 26-28.

101 Kamerbeek 1980 (*ad loc.*) rightly rejects Jebb's interpretation (followed by Webster) that φλέψ here refers to the flow of blood rather than to the vessel itself.

102 Psichari 1908: 104-5 and Guardasole 2000: 108-15.

Theophrastus (fr. 10.3). One example of a plague description from the Hippocratic *Epidemics* illustrates its common use (1.2.8):¹⁰³

Αἱμορραγία δὲ τοῖσι πλείστοισι, μάλιστα δὲ μειρακίοισι, καὶ ἀκμάζουσιν· καὶ ἔθνησκον πλείστοι τοιουτέων, οἷσι μὴ αἱμορραγήσαι ἐγένετο·

Most had copious bleeding, but particularly the youths, who were strong. Most of these ones died who did not have bleeding.

Although Aeschylus draws upon imagery of the vessels containing blood, Sophocles'

Neoptolemus seems to be more concerned with using appropriate medical vocabulary for describing Philoctetes' condition.

This medical imagery appears to serve two primary functions. First, the vivid details emphasize Philoctetes' chronic suffering, one of the play's central themes. Secondly, the unusual clinical vocabulary frames his somatic distress (and his body itself) as exceptional. Philoctetes, isolated and suffering on the island of Lemnos with only beasts to share his company, has often been seen as a liminal character, both on the limits of society and on the limits of humanity.¹⁰⁴ Neoptolemus' description of Philoctetes' wound draws particular attention to the hero's unnatural state: the superficial illusion of a whole contained body has been broken. His suffering and exposed body is not like those of the spectators; however, it is familiar enough that the audience could imagine their own bodies being afflicted in similar ways.

κοίλη φλέψ, E. *Ion* 1011

Further evidence for use of medical language for vessels is found in Euripides' *Ion*.¹⁰⁵ Here again we find a body in a liminal state, although one more explicitly on the boundaries of human

103 For further examples of the term's appearance in the HC, see *Epid.* 2.3.1, *Prog.* 24, and *Aph.* 5.16. See also Ceschi 2009: 63 n.18 for statistical details for the appearance of αἱμορραγ- in the Hippocratic Corpus.

104 See recently Berzins McCoy 2013: 185, Badger 2013: 100-1, and Nooter 2012: 129. Philoctetes' unnatural state has also received a great deal of attention. See for examples Rutherford 2012: 123 and Worman 2000 for Philoctetes' wound as a visible representation of his disturbed mental state; Morin 2003, esp. 390-93 and Avery 1965: 284-85 for particular emphasis on his bestial nature in the play.

and monster. Creusa describes the blood of the Gorgon Medusa that she gave to her son Ion as a baby, and makes special note of its anatomical source (1011):

κοίλης μὲν ὅστις φλεβὸς ἀπέσταξεν φόνος

That gore dripped from the hollow vessel.

The pairing of φλέψ with κοίλη ('hollow vessel') has strong connections to Hippocratic vocabulary.¹⁰⁶ Greek physicians used the term often to refer to large vessels within the body. The technical nature of this phrase is emphasized in three medical texts by the inclusion of the qualifying καλεῖσθαι ('so-called').¹⁰⁷ Appearances such as this in the HC have led Craik to label its use in *Ion* as 'semi-technical'.¹⁰⁸ I would argue that the connection is stronger than that, since the phrase appears only here and in classical biological and medical writings. If the term did originate outside of the medical community, for example in the context of sacrifices,¹⁰⁹ we have no evidence for it. The more common terms for these vessels or 'tubes' in sacrifice appears to be the Homeric λαίμῳς (throat or gullet) or less often σφαγή (the carotid arteries and jugular).¹¹⁰

Euripides also uses the term in a semi-medical context by making the vessel's contents therapeutic: the drop of the Gorgon's blood collected from her serpent hair is deadly; however, the blood from her throat (the κοίλη φλέψ) is a cure for disease (νόσος) and nourishes life (1005-15).¹¹¹ It is significant that the blood from Medusa's 'hollow vein' is the one with healing qualities. Although she is a monster, she remains liminal: below the snake-haired head her body

105 The production date of *Ion* has been heavily contested, although a date somewhere close to 415 BCE is reasonable. Zacharia 2003: 3-4 suggests a date near *Trojan Women* (415), probably 412; Devine and Stephens 1981: 48 argue somewhere between 415-411; Hamilton 1985: 57-58 suggests 414; and Lee 1997: 40 proposes a date of about 413 BCE.

106 Although φόνος (*gore*) is not strictly a medical term, its appearance at *Morb.* 2.73 in a description of 'black bile disease' (μέλαινα νόσος) means that it is not necessarily out of place in a technical context: ὅταν μὲν τὸ μέλαν τὸ αίματώδες ἐμέη, δοκέει οἶον φόνου ὄζειν ('when someone vomits blood-like black bile, it smells like gore').

107 *Vict.* 9, *Loc. Hom.* 3, *Morb. Sacr.* 3.

108 Craik 1998a: 111.

109 Craik 2001a: 90 admits this possibility.

does share close affinities with human bodies, which according to Euripides' description includes her internal parts as well.¹¹² But there is something disconcerting about this connection. The rare medical vocabulary for this unseen vessel in our bodies confuses the boundaries between the natural and the grotesque. In one sense, it perhaps imbues Medusa with some degree of humanity, which is emphasized by her latent posthumous ability to help the sick; in another sense, it brings to light the strange interior of our own bodies that itself can appear hideous.

σφριγξ, S. Aj. 1412

Sophocles provides another term for vessels in Teucer's description of Ajax's self-inflicted wound. The passage here seems to emphasize the horror of Ajax's death through the use of the unusual word (1411-13):¹¹³

110 Aeschylus for example has the poetically redundant phrase ἀρχένιον λαίμων ('throat of the neck,' fr. 273a Radt). See also E. *HF* 822, *Supp.* 1201, and *Ion* 1037. The term σφαγή has the primary meaning of 'slaughter,' e.g. E. *Hec.* 522, Pl. *R.* 610b, and a secondary meaning of 'throat' (i.e. where a victim would be struck in a sacrifice), e.g. Antiphon 5.69. The word, however, at some unclear point becomes extended to human anatomy. It appears with this meaning in the HC, usually in the plural (σφαγαί), which suggests a generalization of the tubes within the neck, including the windpipe, the throat, and possibly the vessels (e.g. *Gland.* 4: τὰς σφαγὰς τοῦ τραχήλου. 'the *sphagai* of the neck'; *Int.* 18 tracks the renal vessels from the head, through the σφαγαί and downward). The word is also applied to human anatomy by Euripides at *Or.* 291. Orestes, speaking with his sister Electra, tells her that his father Agamemnon 'would have extended many prayers to this [*sc.* Orestes'] chin, that never should I thrust a sword to my mother's *sphagai*' (πολλὰς γενείου τοῦδ' ἄν ἐκτείνειν λιτὰς/ μήποτε τεκούσης ἐς σφαγὰς ὧσαι ξίφος). Outside of the HC, the term is only used again for humans at Th. 4.48.3 (the suicide of Corcyrean soldiers, but probably σφαγή = *throat*) before Aristotle (but cf. Diog. fr. 6 DK and Harris 1973: 23 for a possible, although unlikely, exception). Although Euripides is likely playing with the idea of Clytemnestra being equivalent to a sacrificial animal, the uncommon use here is remarkable, especially the plural form of the word (as in the HC), which suggests the awareness of different parts within the neck. For a parallel example in Euripides, see *Hec.* 564-7 where, as Talthybius relates, Polyxena offers her neck (ἀρχήν) for Neoptolemus to cut her throat (λαμός) as a sacrifice. Talthybius in his own words then describes Neoptolemus cutting her πνεύματος διαρροαί ('air channels'). This expression is not attested elsewhere, but cf. Euripides fr. 983 Nauck: οἶνος περάσας πνευμόνων διαρροάς ('when wine passed through the channels of the lungs').

111 1004-5: Πρ. ἰσχύον ἔχοντα τίνα πρὸς ἀνθρώπου φύσιν; / Κρ. τὸν μὲν θανάσιμον, τὸν δ' ἀκεσφόρον νόσων. (Tutor: 'What power do [these drops of blood] have for the nature of a human?' Creusa: 'One is poison, but the other is a cure for diseases.');

and later more on the second drop (1013): Κρ. νόσους ἀπείργει καὶ τροφὰς ἔχει βίου (Creusa: 'It wards off disease and nourishes life.'). Cf. Apollod. 3.10.3 for the story that Asclepius received the blood of Medusa from Athena. The blood that flowed from the left vein caused death, while the blood from the right could restore life.

112 Although iconography of Medusa and Gorgons varies greatly, the creatures' bodies from the head down are regularly depicted as being almost indistinguishable from a female body (save for the inclusion of wings in some images). For useful overviews of Gorgons in Greek art, see Wilk 2000: 31-50 and Tsiafakis 2003: 83-90.

113 The production date of *Ajax* is uncertain. Kamerbeek 1963: 15 maintains the common belief that the performance 'cannot be far from 441 BCE.' See Hesk 2003: 200 for a production range of 450-440 BCE.

ἔτι γὰρ θερμαὶ
σύριγγες ἄνω φυσῶσι μέλαν
μένος.

His channels, still warm, exhale his dark life.

Ceschi has observed that σύριγγξ appears only here in poetry in an anatomical sense.¹¹⁴ The term broadly refers to something hollow, most commonly a reed or musical pipe.¹¹⁵ As a metaphor, it comes to mean a general tube within the body.¹¹⁶ Ceschi locates Sophocles' specific use of the word in medical and biological writings where it is a synonym for φλέψ, while Kamerbeek identifies it with the nostrils.¹¹⁷ Both internal and external evidence seem to support Ceschi's interpretation. Ajax has fallen on his sword, piercing his torso; the audience would therefore expect some visceral gore from such a wound.¹¹⁸ A line spoken by the Chorus to Tecmessa at 938 also perhaps sympathetically foreshadows the specific location of her husband's injury: χωρεῖ πρὸς ἥπαρ, οἶδα, γενναία δύη ('I know, noble grief runs to your liver'). A parallel example of a pierced liver can also be found in Deianira's self-inflicted death in *Women of Trachis*.¹¹⁹ An injury to Ajax's liver would also agree with what classical medical writers tell us about the organ. The Hippocratic ἥπατιτις φλέψ (hepatic vein) was recognized as being

114 'Sophocle è l'unico poeta a ricorrere all'accezione 'anatomica,' che nel V secolo è di pertinenze esclusivamente scientifica' (Ceschi 2009: 83).

115 For reeds: e.g. Thphr. *HP* 4.11.10; for musical pipes: e.g. *Il.* 10.13, Pl. *R.* 399d.

116 E.g. Emp. fr. 100: λίφαιμοι / σαρκῶν σύριγγες πύματον κατὰ σῶμα τέτανται ('bloodless tubes convey fluid throughout the body'); Hp. *Int.* 6, *Morb.* 2.50 (the alveoli), *Morb.* 2.59 (the ureters). The term is also sometimes used in the HC for 'fistulas,' or abnormal connections between parts of the body, specifically anal fistulas (the Hippocratic treatise *On Fistulas* (Περὶ συρίγγων) is devoted to their study and treatment). See Ceschi 2009: 82-83 for discussion.

117 Ceschi 2009: 83; Kamerbeek 1963: 260. Kamerbeek cites the interpretation of Σ *ad* 1412 as evidence: σύριγγες ἀναδόσεις αἵματος ('syrinx: the spurting blood'). This surely must be an explanation of the term's imagery in this line, rather than its definition. Kamerbeek's further parallel with αὐλός (*pipe*) at *Od.* 22.18, however, is worth consideration: αὐλὸς ἀνὰ ῥίνας παχὺς ἦλθεν / αἵματος ('a thick tube of blood came from his nose').

118 See Teucer's description of Ajax's wound at 1024, which illustrates that his torso is still impaled upon the sword: οἶμοι, τί δράσω; πῶς σ' ἀποσπάσω πικροῦ / τοῦδ' αἰόλου κνώδοντος; ('Alas! What am I to do? How will I draw you from this sharp, spattered, sword?').

119 *T.*: 930-31: ὀρώμεν αὐτὴν ἀμφιπλήγι φασγάνῳ / πλευρὰν ὑφ' ἥπαρ καὶ φρένας πεπληγμένην. (Chorus: 'We see that she has struck her sides with the double-edged sword beneath her liver and diaphragm').

especially large and hollow,¹²⁰ and in the medical work *Diseases of Women*, the term σῦριγξ is in fact used to describe this very same vessel.¹²¹ It may be, then, that Sophocles is thinking specifically about vessels of the liver by using the term.

πύλα, E. El. 828

The haruspicy scene mentioned above in the discussion of χέλυς from Euripides' *Electra* is particularly rich with internal anatomical terminology.¹²² The calf's aberrant liver, although never explicitly named,¹²³ is described especially well: it has no lobe (λοβός: 827), and both its portal vein (πύλαι: 828)¹²⁴ and gall bladder (δοχαὶ χολῆς: 828) are ominous.¹²⁵ These terms are uncommon in classical literature, and possibly originate from the practice of divination.¹²⁶ There is scanty evidence from this time period of the technical terminology of haruspicy, which permits us to wonder how often, or even whether, any such detailed language was used in the context of these rites.¹²⁷ There are, however, enough examples of these terms in the HC to suggest that there was an appreciable overlap between medical and sacrificial terminology.

120 *Morb. Sacr.* 10: αἱ φλέβες εἰςὶ κοιλότεραι καὶ πλέονες ἢ ἐν τοῖσιν ἀριστεροῖσιν· ἀπὸ γὰρ τοῦ ἥπατος τείνουσι καὶ ἀπὸ τοῦ σπληνός ('the veins are broader and more numerous [in the right hand side of the torso] than the left, because they extend from the liver and the spleen').

121 *Mul.* 78: Ἦν δὲ ἐκ τόκου αἶμα ἐμέη, ταύτη ἡ σῦριγξ τοῦ ἥπατος τέτρωται· ('If the child vomits blood, the *syrinx* of the liver is damaged.').

122 See Collins 2008 for an useful discussion of Greek and Roman hepatoscopy. See also Easterling 1988: 103-4 for discussion of how this perverted ritual scene relates to greater themes within the play, namely the corruption and violation of norms.

123 The generic terms σπλάγχνα (828, 838) and παστήρια (835) are used instead. Although παστήρια is seen only here in tragedy, σπλάγχνα is often used to describe the inner chest cavity and its parts of both animals and humans. E.g. *S. Ant.* 1066 (for the human womb); *Aesch. Eum.* 249 (for the lungs of the Furies).

124 The vein that conducts blood from the gastrointestinal tract to the liver.

125 See Denniston 1939 (*ad loc.*) for a description of the possible deformities that Aegisthus sees. The gall-bladder in mammals is usually concealed by the lobe, which descends below the line of the liver on the right hand side. Denniston argues that the gall-bladder and the portal ducts look ominous because they should be concealed by the lobe, which is missing in the sacrificed calf.

126 Guardasole 2000: 115-16 comments on this passage without further reference to possible sources: '[Euripide] *utilizzando una terminologia che in parte era divenuta già tecnica.*' She does, however, also comment on the use of the terms in both the Hippocratic and Aristotelian corpora.

127 Flowers 2008: 33 follows Burkert 1992: 49-50 in arguing that Greek hepatoscopy (including its terminology) was heavily indebted to earlier Assyrian practices; however, the Greeks apparently placed far less emphasis on the specific parts of the liver. Instead, Flowers remarks, they seem to have been more interested in the form, colour, and texture of the organ.

The anatomical terms πύλαι and δοχαί appear less frequently in Greek literature than λοβός,¹²⁸ which might suggest their more technical nature. Both do not occur in Athenian tragedy outside of *Electra*. There are, however, a handful of references to these parts of the liver in classical medical and biological works, but nowhere else. Besides the examples provided by Guardasole (Hp. *Epid.* 2.4.1 and Arist. *HA* 496b3), which only mention the πύλαι and λοβός, there is the clearer reference by Plato in his technical description of the liver (ἥπαρ) at *Timaeus* 71c where he names all three parts in the context of the organ: its lobe (λοβός), and its portal vessels (πύλαι) and ducts (δοχαί). The author of *Anatomy* marks the πύλαι as a possible technical term in his description of the liver (1):

Τὸ δὲ ἥπαρ ὁμορυσμίην μὲν ἔχει τοῖς ἄλλοις ἅπασιν, αἱμορρώδέστερον δὲ ἐστὶ τῶν ἄλλων, ὑπερκορυφώσιας ἔχον δύο, ἃς καλέουσι πύλας, ἐν δεξιῶις τόποις κειμένας·

The [human] liver is similar to all others, but is more bloody than them. It has two projecting parts, which they call ‘gates,’ that lie in the right-hand region.

The elliptical syntax of this passage makes it difficult to isolate the referent of the term πύλας. Craik argues that the author means the two lobes of the human liver, elsewhere described in the HC as λοβοί.¹²⁹ The πύλαι, she adds, was more commonly used by medical authors to describe indentations (i.e. entrance points where the vessels connect to the liver). There are several of these on the organ, most notable among them being the vena cava inferior and the portal vein. She posits that the ‘odd terminology’ is a result of summarization in the text, which omitted reference to the portal veins.¹³⁰ Nevertheless, the term, marked by the qualifier καλέουσι ‘they call it’ probably marks it as a technical term.

128 It appears twice elsewhere in tragedy: A. *Eum.* 158 (metaphor of a blow to the body below the lobe); and *Pr.* 495 (Prometheus’ description of his gift of haruspicy).

129 The author uses the term earlier (2) to refer to the lobes of the lungs: πέντε ὑπερκορυφώνιας ἔχων, ἃς δὴ καλέουσι λοβούς (‘[the lungs] have five projecting parts, which they call lobes’).

130 Craik 2006c (*ad loc.*).

Craik also cites the much later (1-2 CE) medical author Rufus on the use of this term

(*Onom.* 179-81):

Πύλη δὲ ἥπατος ἡ φλὲψ, διὰ ἧς ἡ τροφή εἰσέρχεται. Ἄ δὲ ἐν ἱεροσκοπία, πύλας, καὶ τράπεζαν, καὶ μάχαιραν, καὶ ὄνυχα καλοῦσιν, ἔστι μὲν καὶ ἐν ἀνθρώπῳ, ἀσαφῆ δὲ καὶ οὐκ εὐδηλα, καὶ εἰς οὐδὲν ἰατρικὸν ἀναγκαίως ὀνομασθέντα.

A ‘gate’ of the liver is the vein through which nutrients travel. The parts [of the liver named] in haruspicy – the ‘gates,’ ‘table,’ ‘carving knife,’ [or ‘sacrificial knife’]¹³¹ and ‘talon’ – are also in humans [i.e. identifiable parts of the human liver], but are unclear and not well-known, and are not necessary to be named for any medical purpose.

Although this may give the impression that the term πύλη is properly in the domain of divination, at least in his own time, Rufus elsewhere comments that the term was used by early (ἀρχαῖοι) doctors to refer to the attachment to the *vena cava* inferior (*Anat.* 30).¹³² Such a comment leaves room for the plausibility, if not the good possibility, that such vocabulary for the liver was shared by both diviners and physicians. At the very least, references to πύλαι in *Timaeus* and *Anatomy* illustrate the term was appropriated from the language of sacrifice to be applied to medicine and biology. I suggest that Euripides might have been exploiting this unclear division between vocabulary for animal and human parts in the scene to foreshadow Aegisthus’ own imminent demise.¹³³ The audience would have been aware that the calf’s misshapen liver was an omen of this, and Euripides satisfies their expectations: Aegisthus’ body

131 The term is used for a knife used for carving meat (e.g. *Pi. O.* 1.49, *Hdt.* 2.61) and for slaughtering (e.g. *Ar. Pax* 948, *Pl. Com.* fr. 98 K.-A.).

132 It is evident from a few places in the HC that parts of the liver were at the very least identified to be causes of a patient’s sickness and therefore deserved a physician’s attention, e.g. *Epid.* 6.8.28: ᾧ ὁ λοβὸς τοῦ ἥπατος ἐπεπτύχθη, διέσεισα, ἐξαίφνης ὁ πόνος ἐπαύσατο. (‘The one who had the folded lobe of the liver: I shook him and suddenly the pain stopped.’)

133 See Beerden 2013: 55-58 for discussion of this passage in *Electra* as well as *Xen. An.* 5.6.29, where Xenophon boasts to have understood a seer’s activities when examining entrails because he had observed so many similar rites in the past. Beerden convincingly uses these two examples as evidence to suggest that ‘the laymen among the elite [here represented by Aegisthus and Xenophon] were better informed than the average layman’ about extispicy (57). If this is so, then sacrificial terminology like medical terminology was perhaps only vaguely familiar to many of Euripides’ spectators, which would have increased the ambiguity of the scene’s imagery.

is next to be opened up like the sacrificial beast's, revealing things that should remain hidden inside.

ἀρτηρία, S. Tr. 1054

One final example of 'channels' in tragedy, the term ἀρτηρία, appears in Sophocles' *Women of Trachis*. Unlike the above examples, however, the word probably does not refer to blood vessels, but rather to the bronchial tubes within the lungs (1053-57):

πλευραῖσι γὰρ προσμαχθὲν ἐκ μὲν ἐσχάτας
βέβρωκε σάρκας, πλεύμονός τ' ἀρτηρίας
ροφεῖ ξυνοικούν· ἐκ δὲ χλωρὸν αἷμά μου
πέπωκεν ἤδη, καὶ διέφθαρμαι δέμας
τὸ πᾶν

[The poison] is stuck to my sides and eats away at my deepest flesh. Staying there, it empties the channels of my lungs. It has already drunk my living blood, and my whole body is wasting away.

These lines come from Heracles' description of his inner pain from Nessus' poison. Previous scholarship has recognized the medical connections of this passage, but has wavered on whether the ἀρτηρία are the blood vessels of the lungs or the bronchial tubes.¹³⁴ The term itself, unlike σῦριγξ and πύλαι examined above, does not appear to have a primary meaning outside of an anatomical context. Its first attested use is here, and subsequently only in medical and biological writings.

It is impossible to determine for certain which meaning Sophocles intended – blood vessel or bronchial tube – since both uses are attested in Hippocratic and biological writings.¹³⁵ What is clear is that Sophocles locates these 'channels' within the lungs

134 Guardasole 2000: 105 and Ceschi 2009: 80-82 argue that they are bronchi; as does Jebb 1908 (*ad loc.*): “the suspenders of the lungs,” i.e. *the bronchial tubes* which convey air to the lungs.’ Kamerbeek 1970 (*ad loc.*) favours the interpretation that they are vessels. Davies 1991 (*ad loc.*) does not comment on the meaning of the word, but directs us to Long 1968: 57, who defines the word broadly as ‘channels’ and classifies the use of ἀρτηρία here as technical.

135 Vessels, e.g. *Morb.* 2.53, *Epid.* 6.7.2 (in singular), *Art.* 69, *Epid.* 2.53; *Pl. Ti.* 70d2; bronchial tubes, e.g. *Int.* 23. See further the discussion of channels at section 3.3.3 above.

(πλευμόνες). The question then becomes, what did Sophocles think that these channels contain? He mentions blood (αἷμα) and that the poison ‘empties’ (ῥοφεῖ) something from the ἄρτηρία (1055), which immediately suggests to us an identification with blood vessels, although this is not the only possibility.¹³⁶ We must leave the question open, which very well might have been the case for Sophocles himself.

It seems, though, that Sophocles was at the very least aware of the existence of these ‘channels’ within the lungs (which we know as the bronchial tubes and identify with respiration) and described the poison’s effect on Heracles in a medical context using appropriate anatomical vocabulary. *Diseases* 1.22 provides a good example of a medical condition involving the bronchial tubes in diseased lungs of younger people:

αἱ τε ἄρτηρία λεπταὶ καὶ στεγναὶ εἴουσαι οὐκ ἐνδέχονται τὸ πῦον, εἰ μὴ ὀλίγον τε καὶ ὀλιγάκις, ὥστε ἀνάγκη τὸ πῦος ἐν τῷ θώρακί τε καὶ ἐπὶ τῶν ἐλκείων ἀθροίζεσθαι τε καὶ παχύνεσθαι.

Since the channels are slender and impermeable, they do not receive pus, or only a small amount and infrequently. As a result, the pus must gather and thicken in the chest and especially in the area of the disease.

The medical language in this passage has close affinities with the description of Heracles’ suffering. Sophocles’ description further aligns with medical accounts of pleurisy (πλευρίτις), the inflammation of the membranes of the lungs or some similar chest ailment.¹³⁷ Like the poison causing Heracles’ νόσος (1030), medical writers believed that the sickness was caused by the insidious – and sometimes deadly – flow of phlegm (φλέγμα)

136 Sophocles’ use of the perfect πέπωκεν ‘drank’ might also imply that the blood of the lungs had already been drained and that something else is being drained. As well, both medical and non-medical thought of the time associated the lungs with holding other liquids, specifically what we drink, most notably wine (οἶνος). See E. fr. 983 and e.g. Alc. fr. 347a, and for discussion Guardasole 2000: 98-99). The belief was also present among the Hippocratics, e.g. *Morb.* 2.47 and *Int.* 6. Pl. *Ti.* 91a5 provides a general description of the process: διὰ τοῦ πλεύμονος τὸ πῶμα ὑπὸ τοὺς νεφροὺς εἰς τὴν κύστιν ἔλθον (‘drink travels through the lungs past the kidneys and to the bladder’).

137 E.g. *Aph.* 3.23: Τοῦ δὲ χειμῶνος, πλευρίτιδες, περιπλευμονία...πόνοι στηθέων, πόνοι πλευρέων, κτλ. (‘Diseases of the winter: pleurisy, inflammations of the lungs...pain in the upper chest, pain in the sides,’ etc.).

and bile (χολή) to the lungs.¹³⁸ Thus, from an ancient medical perspective, Heracles' body is tormented in an anatomically correct way; however, such rare vocabulary and the imagery it produces must have made a significant impact on the dramatic stage.

5.4.2. Bone: ῥαφαὶ ὀστέων: seams of the skull, E. Ph. 1159-60 and Supp. 503

The three tragedians rarely mention bones (ὀστέα). Aeschylus and Sophocles both use the word only once (A. fr. 367 Radt; S. Tr. 769).¹³⁹ Although the meaning from Aeschylus' fragment is unclear, the appearance in Sophocles' *Women of Trachis* describes the effects of Nessus' poison upon Heracles. Similarly, Euripides uses the word to describe the body of Glauce's father as he embraced his child, which became fixed to her poisoned cloak (*Med.* 1217).¹⁴⁰ Euripides also uses the term for the crushed skull of Heracles' child (*HF* 994).¹⁴¹ He elsewhere mentions the bones seven more times in a general sense.¹⁴² The three tragedians also describe the spine on several occasions (ἄκανθα, ῥάχισ, σφόνδυλος).¹⁴³ Perhaps surprisingly, the sockets or joints of the bones (ἄρθρα) are mentioned more frequently than bones (16 times). These instances generally do not focus upon the internal parts, the specific bone sockets, *per se*. Rather, they emphasize both the articulation of the body and its disarticulation (especially in *Oedipus Rex*,

138 E.g. *Aff.* 7; *Morb.* 1.32; *Aër.* 10.

139 Aeschylus: ὀστέων στέγαστρον, 'cover of the bones'; Sophocles: (ἦλθε δ' ὀστέων / ὀδαγμὸς ἀντίσπαστος· 'there came a convulsing irritation to the bones').

140 εἰ δὲ πρὸς βίαν ἄγοι, / σάρκας γεραίας ἐσπάρασσ' ἀπ' ὀστέων. ('If he used force to move [from Glauce], he would have torn his aged flesh from the bone.')

141 ξύλον καθῆκε παιδὸς ἐς ξανθὸν κάρα, / ἔρρηξε δ' ὀστᾶ. ([Heracles] let the club fall on the tawny hair of the child, and crushed his bones').

142 The bones of Theban soldiers (*Supp.* 949, 1115, 1185); the bones of the dead Evadne (*Supp.* 1107); Polymestor's threat to eat the flesh from the bones of Hecuba and the women of Troy (*Hec.* 1071); the broken bones of the dead Astyanax (*Tr.* 1117); description of a funeral pyre (*Antiope* fr. 48.82).

143 ἄκανθα: A. fr. 275 Radt (of a fish); E. *El.* 492, *Tr.* 117; ῥάχισ: A. *Eum.* 190; S. fr. 20 Radt (cf. E. fr. 849 Nauck: ἄκανθώδη ῥάχιν 'thorn-like spine'); σφόνδυλος: E. *El.* 841 (of a sacrificial calf), *Ph.* 1413.

Women of Trachis, and *Bacchae*).¹⁴⁴ Common references in classical literature to bones (ὀστέα) and sockets (ἄρθρα), however, means that they should not be considered technical terms.¹⁴⁵

In two instances Euripides uses uncommon vocabulary to describe the sutures of the skull, which does suggest a technical vocabulary for bones.¹⁴⁶ The first is in a description of Parthenopaeus' death at the hands of Periclymenos, who crushes his skull with a part of the battlement (*Phoenician Women*, ca. 410 BCE, 1159-61):

ξανθὸν δὲ κρᾶτα διεπάλυνε καὶ ῥαφᾶς
ἔρρηξεν ὀστέων, ἄρτι δ' οἴνωπὸν γένυιν
καθημιμάτωσεν·

He ground to bits [Parthenopaeus'] fair head and split the sutures of his bones, bloodying his ruddy cheek.

The second mention of the sutures of the skull is from *Suppliants* (ca. 423 BCE) in a description of bodies at the gates of Thebes (502-3):

κείνται πρὸς πύλαις λοχαγέται
πέτροις καταξανθέντες ὀστέων ῥαφᾶς.

The leaders lie before the gates, the sutures of their bones rent to pieces by boulders.

The context and feel of these two descriptions – especially the first, which focuses on the moment of death in battle – are decidedly epic;¹⁴⁷ however, the uncommonly specific terminology for the description of the bones is not. It is true that skeletal remains, whether

144 A. fr. 17 Radt (general); S. *OT* 718, 1032, *Tr.* 779 (of the foot), *Tr.* 769 (general), *Ph.* 1207 (of the hand), cf. *OT* 1270 for Oedipus' removal of his eyes (ἄρθρα τῶν αὐτοῦ κύκλων, 'socket of the orbs [eyes]); E. *Andr.* 1078, *Hec.* 67 (of the legs); *El.* 842 (spine of a sacrificial calf), *HF* 1395, *Tr.* 113, 1179, *Ba.* 1210, 1300 (general). Cf. E. *Cyc.* 625: ἄρθρα στόματος ('joints of the mouth,' i.e. 'of the jaw').

145 ὀστέα: frequent in non-medical writings since Homer, e.g. *Il.* 4.174; Hes. *Th.* 540; Archil. fr. 193; Pl. *Pyth.* 5.53; Hdt. 2.41 Th. 1.126.12; Pl. *Ti.* 82d4; ἄρθρα: (not in Homer) e.g. Hdt. 3.129; Ar. *V.* 1494; Pl. *Phdr.* 265e1.
146 Noted in passing by Craik 2001a: 90.

147 Cf. *Od.* 9.289-91: σὺν δὲ δύω μάρψας ὡς τε σκύλακας ποτὶ γαίῃ / κόπτ' ἐκ δ' ἐγκέφαλος χαμάδις ῥέε, δεῦε δὲ γαίαν. / τοὺς δὲ διὰ μελείστι ταμῶν ὀπίσσατο δόρπον· ('[the cyclops] snatched together two [of Odysseus' comrades] and struck them against the earth like pups. Their brains flowed upon the ground and wet it.')

animal or human, would probably not have been uncommon sights for Classical Athenians.

There might also have been opportunities to examine closely the skulls of some of these skeletons. But it is Euripides' unusual labelling of the ῥαφαί (sutures) that is significant, since it aligns with medical terminology.¹⁴⁸

The term appears only in these instances in Greek tragedy and in a very small selection of Classical works outside of the HC. Herodotus mentions the sutures, or the lack of them, in a strange skeleton found on the battlefield at Plataia (9.83):

τῶν νεκρῶν περιψιλωθέντων τὰς σάρκας (συνεφόρεον γὰρ τὰ ὀστέα οἱ Πλαταιεῖς ἐς ἓνα χῶρον) εὐρέθη κεφαλὴ οὐκ ἔχουσα ῥαφήν οὐδεμίαν ἀλλ' ἐξ ἑνὸς ἐούσα ὀστέου·

Of those corpses that had been made bare of flesh (for the Plataians collected the bones into one place) there was one broad skull that had no suture, but was composed of one bone.

Plato in his *Timaeus* also comments on the skull sutures in a manner that suggests close observation (76a-b):

τὸ δὲ τῶν ῥαφῶν παντοδαπὸν εἶδος γέγονε διὰ τὴν τῶν περιόδων δύναμιν καὶ τῆς τροφῆς, μᾶλλον μὲν ἀλλήλοις μαχομένων τούτων πλείους, ἦττον δὲ ἐλάττους.

The multiform appearance of the sutures [of different human skulls] arises from the strength of the passing fluids [emanating from the skull's interior] and the nutrients. The sutures are more when [the fluids and nutrients] strongly conflict with one another; they are fewer when the conflict is less.

Plato here is interested in what can be extrapolated about a person's overall health by counting the number of sutures in the skull. In this regard he was likely influenced by similar notions held

¹⁴⁸ Both Mastronarde and Collard in their short notes mark it as a technical or semi-technical medical term.

Collard 1975: 243 (on *Supp.* 502-3): 'ῥ. was a technical term of the new science of medicine, and common in the HC, but not attested earlier.' He continues to cite several other possible uses of medical language in the play (223-25, 717, 944-45, 1064, 1110-11 [?], and 1205), although none of them are anatomical. Of the two, Mastronarde (on *Ph.* 1159) is more reserved in his assessment of the term as part of medical terminology. After noting on the similarities of this passage to Homer's anatomical descriptions (pointing to *Il.* 12.384-5 and a handful of others), he assesses ῥαφᾶς...ὀστέων as a 'quasi-technical anatomical term.' (Mastronarde 1994: 473-74).

by his contemporary physicians. Both he and the HC authors were curious why they would see (mistakenly) a difference in the number of sutures between skulls.¹⁴⁹

The sutures are mentioned frequently in the Hippocratic treatises on the treatment of broken bones, especially *Wounds to the Head*. The sutures of the skull are prominent in the programmatic introduction to the work:

Τῶν ἀνθρώπων αἱ κεφαλαὶ οὐδὲν ὁμοίως σφίσιν αὐταῖς, οὐδὲ αἱ ῥαφαὶ τῆς κεφαλῆς πάντων κατὰ ταῦτὰ πεφύκασιν.

The skulls of humans are not the same among themselves, nor are the sutures of everyone's skull arranged in the same ways.

The author then continues to describe their various positions, relating them to shapes of letters.

His reason for discussing the sutures in such detail becomes clear later (12):

Ξυγκλέπτουσι...τὴν γνώμην καὶ τὴν ὄψιν τοῦ ἰητροῦ αὐταὶ αἱ ῥαφαὶ ῥωγμοειδέες φαινόμεναι

The sutures themselves beguile the judgement and sight of the physician, since they appear to be fracture-like.

Wounds to the head, he tells us, when severe enough expose the skull and its sutures. The doctor is sometimes left to wonder whether there is a true fracture of the skull or whether he is only seeing the skull's natural sutures. In either case a special course of medical intervention is necessary. By knowing the different joint formations of the skull, the physician can minimize his mistakes.¹⁵⁰ The author of *Places in Humans* has a more abstract notion about what the sutures of the skull mean. He first describes to the reader the presence of sutures (6): Αἱ κεφαλαὶ ῥαφᾶς ἔχουσιν, αἱ μὲν τρεῖς, αἱ δὲ τέσσαρας ('the heads [of humans] have sutures, some

149 See Craik 1998a: 121 for a useful summary of the study of skull sutures in ancient medicine, which she observes was absorbed with counting the number of sutures. She further posits that the variation of numbers seen might have been a result of viewing skulls from different angles. Also, in her short note on Hdt. 9.83, she suggests that age of the person at death could have been a factor, since the sutures close as a person ages. See further Skoda 1988: 12-14.

150 See *Epid.* 5.27-28 for two case histories describing how the sutures of the skull can lead to a misdiagnosis of an injury.

have three, some have four’). After a very short description of the different arrangements, he adds that the more sutures a person has, the healthier he or she is.¹⁵¹

The above examples from Plato and the HC suggest that there were practical medical reasons for investigating the joint lines of the skull. First, identifying suture-forms can reduce the possibility of error when treating head wounds. More abstractly, in what in some ways anticipates later practices of phrenology, the sutures of the skull could tell about the overall disposition of a person. Outside of medicine, the practical reasons for paying attention to the joints of the skull were limited. Although there was likely at least the occasional opportunity for a layperson to observe a bare skull, beyond medical and biological investigations there would have been little need to pay attention to the sutures and probably even less need to establish a specific term for them.

Euripides’ appropriation of this technical term with limited use was probably intentionally jarring to his audience. The context of both passages in the *Phoenician Women* and *Suppliants* are ostensibly of a Homeric quality, each describing detailed deaths on the battlefield. Mental images of what should remain unseen – the gore and bones – suddenly becomes thrust upon the spectator. The addition of this word for the skull’s sutures in this context is congruent with Homer’s perceived arcane medical knowledge. But being non-Homeric, the term illuminates Euripides’ erudition in the newly developing field of Hippocratic medicine. At the same time, it challenged the audience to grasp the meaning of what is being meant by the phrase ‘stitches of the bone.’ The choice of imagery is apt in both instances. The skulls in both passages are crushed along the stitches, encouraging comparisons to fabric and potentially emphasizing our own corporeal fragility: we can be broken to pieces materially as easily as lexically.

151 ὑγιεινότεροι δ’ εἰσὶ τὴν κεφαλὴν οἱ τὰς πλείονας ῥαφὰς ἔχοντες.

5.5. Conclusions

The tragedians, especially Sophocles and Euripides, used elusive Homeric/poetic and technical terms for the body to construct their characters, thereby problematizing their material constructions in ways that challenged the audience. As suggested by both Aristophanes and Aristotle, tragic authors used diction that audience members found difficult to comprehend; but as Aristotle argues, such word choice would be permissible (or at the very least excusable), if it did not negatively obscure sense. It was part of the poetic art to create the grotesque and the uncanny.

Examples of the three categories of unusual anatomical terms in tragedy – the torso, channels, and bones – correspond with areas of interest and term-creation in medical writings. In most cases, the terms discussed were rarely, if ever, used outside of their single appearance in a tragedy and prose writings that had technical interests in the construction of the human body. Words that tragedians used to describe the torso – κύτος, χελύς, and θώραξ – were particularly important in medical writings for emphasizing the capacity of the body. In tragedies, they are used in a similar manner, but the terms also emphasized the problematic divisions both between the exterior and interior body and between human and non-human. Words for channels – (κοίλη) φλέψ, σῦριγξ, πύλαι, and ἀρτηρίαί – reveal this strange interior to the audience, and suggest the precarious nature of existence based on these fragile but life-sustaining parts. Euripides' two technical descriptions of the ῥαφαὶ ὀστέων (sutures of the skull) underscore this very same thing. Such vocabulary is usually restricted to pivotal scenes where a character's suffering is brought to the forefront of the dramatic action. Moreover, they perhaps reinforced the spectators' feelings of incongruity between the living enclosed body and the exposed body at or near the point of death.

This range of anatomical vocabulary in tragedy illustrates playwrights' willingness to use uncommon terms for the body that were becoming disseminated among the intellectual milieu. This suggests that they had some exposure to medical ideas reflected within the HC. Unfortunately, the complex and obscured history of the texts within the HC makes it impossible to identify any specific medical works as the sources for the tragic language.¹⁵² It also is difficult to say how popular these terms were among the general Athenian population. If the frequency of these terms' appearances in other writings is any indication, they were not widely used. Although it is impossible to make any certain claim about the comprehension of any one term by the audience, the metaphorical or abstract/general origins of these terms meant that a spectator could probably make some sense out of what part of the body was being described, especially when the part being referred to was external. Furthermore, if we are to trust Aristotle's opinion, hearing strange vocabulary was part of the theatre experience. The audience did not need to understand completely every term that was being used – just as many today would not understand everything said in a medical television drama today – so long as comprehension of the story or its part was not unduly hampered.

152 The dating of the earliest medical writings to the middle of the 5th century may provide grounds for us to locate tragedians' interaction with them to sometime close to 440 BCE or possibly even later (allowing time for the development of medical writings and for their dissemination among non-professionals). Production dates for Sophocles' *Women of Trachis* and *Ajax*, then, might be nearer to end of the 440s than to the 450s.

Chapter 6

The Body in Comedy

In this chapter, I turn to possible examples of medical anatomical vocabulary in comedy. Our primary sources of evidence are the plays of Aristophanes (*ca.* 440 BCE – 388 BCE); however, fragments from later comic playwrights provide other examples of medical language in 4th century drama. The later date of these comic plays when compared to our earliest surviving tragedies means that they were all produced when medical writings appear to have been in circulation within Athens. At the very least, this allowed opportunities for comic playwrights to have been exposed to medical vocabulary. My specific claim is that unusual anatomical words found in the HC were congruent with other ways of representing the body on the comic stage. Both the grotesque costumes of comic actors and convoluted descriptions of bodies destabilized common notions of the body's construction. Medical vocabulary, especially metaphors and terms derived from animal sacrifices, provided another possible source for comic playwrights to exploit as part of their humour. But unlike the exceptional descriptions of bodies in tragedy that commonly emphasized a character's suffering, body parts in comic theatre were exaggerated and confused to the point of absurdity.

As a further contribution, I suggest that comic plays provide useful evidence for an increasing familiarity with medical anatomical language in the later 5th and 4th centuries. As in tragedy, language in Athenian comedy was influenced by current trends, yet comic playwrights

had even greater liberty to exploit vocabulary of the current intellectual milieu for their jokes.¹ This feature of comedy potentially made it easier for playwrights to draw upon contemporary innovations in anatomical vocabulary to help form the absurd bodies on stage. In general, though, we see fewer unusual anatomical terms in comedy than we do in tragedy. Beyond the limitations caused by our reliance on the works of Aristophanes, another reason for this seems to be a greater need for clarity in comic theatre. Although tragedians could appropriate potentially obscure medical metaphors for body parts as an element of their poetic language, in comedy such language was usually restricted to parodies. This requires some degree of sensitivity to different genres. If a joke about or containing unusual vocabulary was to be successful, comic playwrights needed a broad audience, which extended beyond the educated elite, to understand why a character was using a word, i.e. exactly who or what was being parodied.²

From the available evidence, it appears that a 5th century audience could not always be expected to identify medical jargon for the body as the direct object of a joke; however, they apparently could recognize when a character was imitating similar language in tragedy. Additional elements such as tragic metre and familiar character types helped to signal the source material for the parody. Examples I discuss from later 5th and 4th century comedies suggest an audience that was becoming more familiar with medical ideas and language. In these instances, comic playwrights use medical or quasi-medical vocabulary at times when there is no indication of tragic imitation. Instead, either a medical context or identifiably Ionic terms (the dialect of the

1 As Dover 1972: 72 writes: 'Comedy, alone of Greek literary genres, combines all the registers of Greek utterance which are known to us...The predominant register of dialogue is common to comedy, prose literature and documents; but even comic dialogue is poetry, and the comic poet does not deny himself the freedom of all poets to play with language'; and later (77): 'In Aristophanes' time a number of technical languages were in process of development: first perhaps, in architecture and administration... then in medicine, intellectual speculation in general, and...literary and rhetorical criticism...Linguistic enterprise is characteristic of the fifth century as a whole, and much of the colour in Aristophanes' language is best explained by the assumption that the comic poet, no less than practitioners of other literary genres, was inventive, subtle, and sensitive to combinations of associations.'

2 See Willi 2003: 67-68 for a similar appraisal of the technical terms used in Ar. *Nu* (e.g. philosophical, rhetorical). For a good discussion of the broad audience of comic theatre, see Csapo 2010: 120-24.

Hippocratic Corpus and other technical writings) would let the audience know that the playwright was playing with specialized language.³ In all cases, though, we cannot expect that every theatregoer would understand the exact meaning of any given word (indeed, such confusion could be useful for comic effect). It seems to have been sufficient that a spectator recognized it as the sort of thing that a specific group would say.

6.1. Previous scholarship

As part of the intellectual elite, comic playwrights seem to have had some familiarity with medical thought. Most scholarly attention to medical language in comedy has been restricted to Aristophanes, and has generally treated words for disease and treatment more fully than anatomical terms.⁴ Miller, following his analysis of medical language in tragedy, provides one of the earliest studies of comedy's use of medical vocabulary.⁵ His conclusion is that Aristophanes appropriated some medical terms, which in turn broadened the range of words acceptable for later Athenian comedy. Among these terms are ones that Aristophanes uses in their literal sense. Others (which Miller finds more interesting) are used metaphorically and irrationally for the sake of a joke. The references to anatomical vocabulary in Miller's study are limited primarily to injury to and treatment of the head and brain,⁶ and to some words for the body used regularly in

3 Colvin 1999: 265-70 in his discussion of Ionic vocabulary in comedy suggests that one reason for its appropriation was because it reflected the Ionians' didactic impulses and their 'fondness for offering explanations.' He continues to explain that the dialect was also known in Athens for its technical, sophisticated, and '(more traditional) decadent and effeminate nature.'

4 For a short note on Aristophanes' references to medicine, see Leven 2005, s.v. 'Aristophanes.' For further discussions, see Jouanna 2000 and Soleil 2010. See Casevitz 1983 for a list of references in Aristophanes to both physicians and sickness. Gill and Alfageme 1972 provide one of the fuller discussions on the topic, providing analyses mainly of references to diseases and to depictions of physicians in Greek comedy. Their general claim is that comedy at the end of the 5th century BCE reflects a significant amount of popularization of medical terms in Athens. See for example their comment on Pl. Com. fr. 200 K.-A., a contemporary of Aristophanes: 'El fragmento es una buena muestra de la vulgarización de la terminología médica en Atenas (cf. πλευρίτις, φθόγη, ἐσχάρα) a finales del siglo v a. C.' (p. 38).

5 Miller 1945.

6 ἐγκέφαλος (*Nu.* 1276, *Ra.* 34); κεφαλή (*Pl.* 728).

the HC.⁷ Although Miller's discussion in general suggests Aristophanes' occasional appropriation of medical language, it is hampered by the lack of analysis of each term and its context in the play. Byl's study builds upon Miller's, but focuses on Aristophanes' two final plays, *Assemblywomen* (ca. 392 BCE) and *Wealth* (388 BCE).⁸ Like Miller, he argues that Aristophanes employed medical vocabulary similar to that found in the HC. He adds, though, that such language is found in higher concentrations in his later plays when medical writings were more firmly established in Athens.⁹

The most exhaustive analysis of Aristophanes' use of anatomical vocabulary is Southard's dissertation on Aristophanes' medical language.¹⁰ Her general conclusion is that Aristophanes possibly used 'technical' medical vocabulary, but she avoids any definitive assertion. Chapter 3 is specifically devoted to the comic poet's vocabulary for the body. Her analysis consists of a list and brief analysis of 89 terms used by Aristophanes that she identifies as anatomical.¹¹ She makes two conclusions about the anatomical vocabulary of Aristophanes:

7 τῶ νεφρῶ βουβωνίῳ (*testicles*) *Ra.* 1280; θώραξ (*chest*) *V.* 1194; κοτυληδῶν (*hip-joint*) *V.* 1495; κοιλία (*belly*) *Ra.* 485 and σφόνδυλος (*spine/vertebrae*) *V.* 1489.

8 See Sommerstein 1998a: 1 for a date range of between 393 and 389 BCE for *Assemblywomen*; and Sommerstein 1983: 1 for a production date of 388 BCE for *Wasps*.

9 Byl 1990. His analysis, restricted to a few sentences for each word (generally citing the word's appearance in a play and the number of occurrences in the HC), contains 4 anatomical terms: ἴς (*fasciae*) *Pax* 86; ἦτρον (*abdomen*) *Th.* 509; ὑπογάστριον (*abdomen*) *Eq.* 195; σφυρόν (*ankle*) *Eq.* 276. I discuss ἦτρον and ἴς in greater detail below.

10 Southard 1971.

11 This number can be increased by 13 in Aristophanes and by another 11 in the fragments of other comic playwrights. Additional terms in Aristophanes that are not included in Southard's list include: ἄκανθα (*spine*, here of a fish [i.e. *dorsal fin*]), *V.* 969; ἄστρογάλοι (*knuckle bones*, here used as dice) *V.* 295; γομφίος (*molar*), e.g. *Plut.* 1059, *Pax* 34; ἐπισκύνιον (*brow*) *Ra.* 823; ἦτρον (*abdomen*) *Th.* 509; λαίμος (*throat*) *Av.* 1560; πλάγιον (*side of the torso*) *Pax* 869; πρᾶπίδες (*diaphragm / heart*) *Th.* 103; ῥάχις (*spine*) *Ly.* 314; σιαγών (*jaw bone*) fr. 300 K.-A.; σκάφιον (*crown of the head*) fr. 620 K.-A.; χόλιξ (*guts*, here of an ox) *V.* 1144; ὠλένη (*elbow*) *R.* 1322. This number is also slightly augmented by variations (e.g. προ-κέφαλος in fr. 112 and 557, s.v. κεφαλή) and euphemisms for genitals. For additional terms in the fragments of other comic poets that do not appear in Aristophanes: ἄρτηρία (*windpipe*), *Alex.* fr. 37 K.-A. (although the likely emendation ἀτήρια [*wickedness*] has been suggested by Arnott 1965: 300-1); βρέγμα (*sinciput*) *Stratt.* fr. 35 K.-A.; δέρρις (*skin*) *Eup.* fr. 357 K.-A., *Pl. Com.* fr. 267 K.-A.; ἐπιπλόον (*omentum*) *Epich.* fr. 69 K.-A.; ἰσχίον (*hip*) *Autocr.* fr. 1 K.-A., *Alex.* fr. 103 K.-A.; λαπάρη (*flank*) *Diocl. Caryst.* fr. 193 Wellm., *Epich.* fr. 69 K.-A.; μαζός (*breast*) *Phryn. Com.* fr. 61, *Epich.* fr. 62.162 K.-A.; μετόφρενον (*part of the back behind the diaphragm*) *Men. Dys.* 524; παραστάτης (*testicle*) *Pl. Com.* fr. 174 K.-A.; πιμελή (*soft fat*) *Alex.* fr. 83 K.-A.; πτερνή (*heel*) *Cratin.* fr. 74 Austin, *Stratt.* fr. 220 Austin.

1. Aristophanes is similar to his contemporaries in his general interest in human anatomy, something already evident in Homer.
2. Partially because of the underdevelopment of medical technical vocabulary, Aristophanes uses anatomical terms that were part of the common vernacular.

Southard's identification of anatomical words is impressively thorough; however, her findings can be called into question on some important points. The first is her limited analysis of each word, which in most cases solely consists of a list of citations in Aristophanes, the HC, and Aristotle. In doing so, there is little to no context given, which often is needed to identify whether or not a technical term is being used as or in a joke. Southard's alphabetical list of anatomical words in Aristophanes also effectively buries among the common ones all those that probably ought to be included in the category of specialized vocabulary. It can be expected that all non-specialists would mostly use terminology appropriate for their respective genres. Aristophanes is no exception, and so we naturally find far more common terms for the human body in his works.

In a more recent study of Aristophanic language, Willi is similarly sceptical about the playwright's use of medical vocabulary.¹² The focus of his analysis is not a full appraisal of Aristophanes' anatomical vocabulary, but rather a response to terms identified in Miller's and Byl's earlier work.¹³ Like Southard, Willi argues that proposed examples of medical vocabulary in Aristophanes cannot be considered technical, since such language was also in the domain of the general public.¹⁴ The evaluation relies upon his strict definition of technical terminology,

12 Willi 2003: 79-87.

13 Of the 89 anatomical terms used by Aristophanes that were identified by Southard, only 9 appear in Willi's analysis: κοτυληδών (*hip-joint*), θώραξ (*chest*), πλευρά (*lungs*), ῥίς (*nose*), ἀντικνήμιον (*shin*), ἴς (*sinew*), κοιλία (*belly*), σφόνδυλος (*vertebra*), and σφυρόν (*ankle*). Willi mentions that he has omitted terms appearing in fragments, since 'The general reservations expressed...would hold true for those words as well' (80).

14 See Soleil 2010 for a similar appraisal of Willi's position on medical language on Aristophanes. She argues that he is right to be more wary than Miller was about any broad statements about Aristophanes' appropriation of technical medical language. Nevertheless, she argues for and reiterates the strong motif of disease in Aristophanes' plays.

which he primarily limits to an ‘exclusive specialists’ discourse.’¹⁵ This concept of technical vocabulary therefore all but precludes any word that appears even once outside a work intended for experts.¹⁶ He maintains that the importance of medicine in health and healing meant that formerly technical medical terms were quickly absorbed and naturalized into the general language.¹⁷ As I shall argue, though, comic playwrights generally used technical anatomical vocabulary precisely because it had yet to become fully absorbed into the common vernacular. A broader audience that did not share elite interests in medicine could likely understand the meaning of these terms (since developing medical anatomical language was mostly based on metaphors and compound words), yet they would have remained strange, and thus would have been useful fodder for comic poets to appropriate as funny words.

6.2. The grotesque body: costumes and lists

There were some good reasons for comic playwrights to use unusual anatomical vocabulary. Besides providing a way to parody either tragedians or physicians, these terms served to destabilize the body by overemphasizing certain parts, a common feature already seen in the earliest fragments of Greek comedy. Moreover, we find that most of these terms were funny, and therefore fitting for comedy, because of their ambiguity. For example, metaphors for body parts had the potential to create comic confusion. A character could use a term for a breastplate (θώραξ) when he meant the ‘chest’; likewise, a term for ‘abdomen’ (ἦτρον) could be mistaken for ‘pot.’ Other rare terms found in comedy – especially for internal parts – were used in both medical and in sacrificial contexts: ψόα (*lumbar muscle*) was a word for something that could be found in either a human or an ox; ἴνες (*sinews/fasciae*) on the comic stage could belong to both

15 Willi 2003: 79. The definition appears in his analysis of legal language.

16 He does acknowledge that some medical technical language was used in Thucydides’ description of the plague at Athens, but argues that it had ‘not acquired the status of a folk-linguistic stereotype and had not yet become prominent enough to be imitated and adapted in a literary genre that addressed a wide audience’ (Willi 2003: 87).

17 Willi 2003: 80.

a person or a bizarre giant dung-beetle. The result was a collection of words that confused boundaries between humans and animals.

Recent attention to Bakhtin's theory of the carnivalesque – particularly to the carnivalized body – provides a useful approach to understanding the playwright's use of anatomical words. Platter in his analysis of the 'carnivalization of genres' in the plays of Aristophanes identifies the main tenet of Bakhtin's carnival culture:¹⁸

Carnivalization brings together, unifies, weds, and combines the sacred with the profane, the lofty with the low, the great with the insignificant, the wise with the stupid.

Platter spends minimal space discussing the physical dimensions of this carnivalization in favour of Aristophanes' approach to parodying literary genres, yet both the displayed and the described material body are important elements within Athenian comedy. Bakhtin identifies three principal ways in which the grotesque body can be formed: exaggeration, hyperbolism and excessiveness.¹⁹ These processes produce artificial constructions of a body that is always in flux: 'It is never finished, never completed; it is continually built, created, and builds and creates another body.'²⁰ Following Bakhtin, I argue that serious medical models of the body (often via tragic vocabulary) had the potential to create this very thing from the perspective of a non-professional, and as a result they presented comic authors (either directly or indirectly) with a useful source of material for their own humorous representations.

The absurd body is of course visually well-represented in the costumes of comedy, and conforms with Bakhtin's model of the grotesque.²¹ The full-length body suit (fleshings), the

18 Platter 2007: 7; see also Bakhtin 1984: 123.

19 Bakhtin 1965: 303.

20 Bakhtin 1965: 317. See also Valakas 2002: 29-30 for this process in Attic comedy.

21 Lowe 2008: 26: 'comic costume was distorted and deliberately grotesque, with leering masks and exaggerated belly, buttocks, and phallus.' See Varakis 2010 for a fuller account of the grotesque fabrication of comic body, with specific focus on visual representations found on pots.

padded belly and buttocks, and the elongated phallus that an actor donned (sometimes collectively called σωμάτια [*little bodies*])²² were the application of another body. Because of its unique way of distortion, this outfit in turn created a ‘generic’ body on the comic stage. This costume allowed playwrights to appropriate any character (either real or fictional) into their comic worlds. Thus these bodies become normalized within the context of a play in a way that allowed its characters to become distorted/inverted representations of the homogenized Athenian population. A comic playwright could utilize the ‘otherness’ of his characters to comment obliquely upon contemporary issues.²³ This interpretation explains why characters rarely mention their own exaggerated bellies and buttocks in an otherwise highly self-referential genre.²⁴ Comic bodies were not exceptional within their dramatic confines; they were normalized, and hence there was no need to bring attention to their absurd proportions. Yet, from the audience’s perspective, these destabilized bodies (much as in the case of medical texts) became artificial constructions that were useful tools to encourage reflection.

One of the strongest similarities between comic playwrights and medical authors are their detailed listings of body parts (Bakhtin’s ‘excessivness’). Hippocratic authors regularly stressed individual parts of the body as ways to diagnose disease, and thus compiled lists of these parts in order to organize their observations. An excellent example of this is at *Epidemics* 4.43:

“Ὅτι τοῖσιν ὄμμασι, τοῖσιν οὖσιν, τῆσι ῥίσι, τῇ χειρὶ αἰ κρίσιες, καὶ τὰλλα, οἷσι γινώσκομεν. Ὁ ἀσθενέων· ὁ δρῶν, ἢ θιγῶν, ἢ ὀσφρανθεῖς, ἢ γευσάμενος, τὰ δ’ ἄλλα γνούς· τρίχες, χροίη, δέρματα, φλέβες, νεῦρα, μύες, σάρκες, ὀστέα, μυελός, ἐγκέφαλος, καὶ τὰ ἀπὸ τοῦ αἵματος, σπλάγχνα, κοιλίη, χολή, οἱ ἄλλοι χυμοὶ, ἄρθρα.

22 See Pl. Com. fr. 287 K.-A., and Revermann 2006: 157. Theatre costumes (including clothing) were called σκευαί (*equipment, apparel*), e.g. Ar. Ra. 108 and Pl. R. 577b; see Storey 2011: 154-55 for a brief discussion. Pollux (4.115) uses both terms to describe theatre costumes. See further Stone 1981: 135-38 and Hughes 2012: 180-82 for discussions of the padded costume and its terminology.

23 Revermann 2006: 148-49 and 152, Foley 2000: 310. For a different view, namely that the comic body is anti-civic (in contrast to the civic body seen in tragedy), see Winkler 1990. See Green 2002, esp. 130 for a similar interpretation.

24 Stehle 2002: 347, Foley 2000: 300, Stone 1981: 131.

Crises and other things: we know them through our eyes, ears, nose, and hand. The one who is sick: his activity, touching, smelling, tasting. The other ways of knowing: hair, complexion, skin, veins, cords, muscles, flesh, bones, marrow, brain, and the parts of blood, the higher organs, the belly, bile, the other humors, the joints.

Such a loosely grouped aggregation of body parts has the potential to throw the body into a state of confusion (note especially the asyndeton). A firm sense of the unified whole is lost in the mass of loosely arranged muscles, organs, and fluids that fail to give a complete picture of the body. There is no containing framework. In the language of Bakhtin, '[i]t is unfinished, outgrows itself, transgresses its own limits.'²⁵

While medical writers were attempting to make sense of the body through their attention to its specific parts, comic playwrights exploited anatomical vocabulary to distort their characters in funny ways. Their focus upon certain common parts makes them grotesquely amplified through frequency of reference,²⁶ and the whole is obscured through the habit of excessive listings of parts. Uncommon or newly-coined terms similarly emphasize the body's strangeness by directing the audience's attention to some of their parts that are rarely singled-out. The flexibility of comedy to suspend reality permits the body itself to be burlesqued.

This trend is seen already in one of the earliest comic poets, the Syracusan Epicharmus (*ca.* 550 – *ca.* 450 BCE). Aristotle credits him along with Phormus as being the first to create comic plots (*Po.* 1449b5),²⁷ and Plato places him at the pinnacle of comic poets (*Theat.* 152e).²⁸

Diogenes Laertius further records that his literary pursuits extended beyond the stage. According

25 Bakhtin 1965: 26.

26 Henderson 1991: 108-50 provides an exhaustive analysis of the naming of genitals in Athenian comedy. See Dover 1987: 243 for his comments on such anatomical as well as physiological language: 'Linguistic obscenity is easily identified in Greek literature, perhaps more easily than in many other literatures, because so many anatomical and physiological terms, whether refined or slang, are entirely confined to comedy and to some terms – vituperative or strenuously obscene – of archaic iambic poetry; in all other literary genres, including technical works on medicine, they are replaced by euphemisms, although what they denote is made plain enough.'

27 See Cassio 1985 for a discussion of Epicharmus' influences on Athenian comedy. See Olson 2007: 6-11 for a discussion of his comedies and his familiarity to Athenian authors.

28 τῶν ποιητῶν ἄχροι τῆς ποιήσεως ἐκατέρας, κωμωδίας μὲν Ἐπίχαρμος, τραγωδίας Ὅμηρος. 'the acme of poets of each type are Epicharmus in comedy and Homer in tragedy.'

to him, Epicharmus was the son of the physician Helothalus of Cos, who moved to Sicily when Epicharmus was an infant. In addition to his comic writings Diogenes adds works on natural philosophy, maxims, and medicine (D.L. 8.72). None of these writings and only fragments of his comedies survive, and it is likely that the medical writings associated with him were later forgeries.²⁹ But these medical treatises ascribed to Epicharmus, which were perhaps in circulation as early as the end of the 5th century BCE,³⁰ illustrate that it was not unimaginable to the following generation that a comic playwright might also be an expert in medicine.

Although his surviving comic fragments do not suggest strong medical influences, they do illustrate highly detailed, perhaps even grotesque, descriptions of the body that continue to appear in later Athenian comedy. One fragment from the play *Busiris* is a good example of this (fr. 18 K.-A.):

βρέμει μὲν ὁ φάρυγγ' ἔνδοθ', ἀραβεῖ δ' ἅ γνάθος,
ψοφεῖ δ' ὁ γομφίος, τέτριγε δ' ὁ κυνόδων,
σίξει δὲ ταῖς ῥίνεσσι, κινεῖ δ' οὐατα.

His throat grumbles, and his jaw grinds, and his molar creaks, and his canine tooth shrills,
and he whistles from his nostrils, and he moves his ears.

The play likely followed the story of Heracles' killing of the eponymous evil king of Egypt who would sacrifice visitors to his land. Heracles, regularly a glutton in comedy, is perhaps the one described here.³¹ The dental language used is particularly uncommon, but none of the

29 Pickard-Cambridge 1962: 235 and 239-47 argues that Epicharmus' proposed philosophical and medical writings are suspect, if not patent forgeries. Cassio 2002: 53 picks up on Pickard-Cambridge's discussion of philosophical notions present in Epicharmus' fragments to claim that 'his role as a popularizer of philosophical themes must have been remarkable.' See Battezzato 2012 and Rodríguez-Noriega Guillen 2012: 87-95 for similar positive analyses of Epicharmus' interactions with philosophy, most notably Pythagoreanism.

30 Cassio 1985: 37.

31 See Pickard-Cambridge 1962: 260; so Olson 2007: 40. Sommerstein 1998: 20 identifies the object of this description as Busiris, who elsewhere is described as a cannibal (Isoc. 11.5). If this is so, we have another layer of disgust: the food he is gorging upon would then be human flesh.

anatomical terms are limited to the medical profession.³² What Epicharmus achieves through this aggregation of terms is to overemphasize the individual parts of the eater's face at the expense of the whole. Olson also remarks how the anatomical descriptions – throat and jaw, molar and canine tooth, nostrils and ears – reverse the sequence of the chewing and swallowing process.³³ This reversal further emphasizes the distortion of the character's parts.

Another fragment from Epicharmus' *Woman from Megara* illustrates a second way that anatomical lists are used in Greek comedy: to confuse the boundaries between humans and animals (fr. 79 K.-A.):

τὰς πλευράς οἶόνπερ βατίς,
τὰν δ' ὀπισθίαν ἔχεις, Θεάγενες, οἶόνπερ βάτος,
τὰν δὲ κεφαλὰν ὀστέων οἶόνπερ ἔλαφος οὐ βατίς,
τὰν δὲ λαπάραν σκορπίος πᾶσις ἐπιθαλάττιος τεοῦ.

You have the sides like a *batis* [female ray],³⁴ Theagenes,
and the rear like a *batos* [male ray];
and a bony head like a deer, not a *batis*,
and your slave the flank of a water scorpion [red scorpion fish].³⁵

Although the lack of context makes it difficult to determine the meaning of the passage, it is evident that the bodily description is monstrous. The incongruent mapping of animal anatomy upon a human form (as well as the blending of masculine and feminine elements) is clearly

32 Aristophanes describes the molars (γομφίοι) of both a dung beetle (*Pax* 34) and an old woman (*Pl.* 1059). See also Phrynichus fr. 73 K.-A. (teeth being knocked out), Xen. Mem. 1.4.6, and Hdt. 9.83. The latter two references are in passages describing curiosities of bodies. The term also appears at Hp. *Epid.* 5.100, 7.113, and *Oss.* 12. Canine teeth (κυνόδοντες) are mentioned less frequently. In addition to this passage, there are only two appearances of the term before Aristotle: Xen. *Eq.* 6.8 (a horse's canine teeth in the process of applying the bridle); and Hp. *Aph.* 3.25 (a description of discomfort of canine teeth during teething). Φάρυγξ (*throat*) is often associated with gluttony, and appears already in *Odyssey* in reference to the cyclops Polyphemus (9.373). Euripides uses the term again in his parody of the episode (*Cyc.* 215, 356).

33 Olson 2007: 41.

34 βατίς and βάτος are the feminine and masculine names respectively for a species of ray (*raja asterias*). See Arist. *HA* 565a22 (βατίς: in a description of eggs) and 489b6 (βάτος: in a description of aquatic animals with uncovered gills). See further Hoffman and Jordan 1892: 237-38.

35 *Scorpaena scrofa*, so called because of its venomous spines (Hoffman and Jordan 1892: 274).

meant to be strange and unflattering.³⁶ It does, however, contain traces of things that the audience would be familiar with: human bodies, fish bodies, and deer bodies. The parts by themselves are natural, yet their arrangement is quite unnatural. The repetitive verbal structure of the passage – for examples, the incipient definite articles in each line and the naming of the body part followed by the animal to which it belongs – further reinforces the material structure behind Epicharmus’ creation, helping to make the monster’s existence more believable.

The symmetry of Epicharmus’ list is also a feature of how the body is sometimes described in later Athenian comedy. Aristophanes illustrates a similar technique in his *Clouds*.³⁷ Here Strepsiades, the comic protagonist, describes ‘Corinthians’ (playing with the similarity of their name to bedbugs [κόρεις]) attacking him (709-15):

ἀπόλλυμαι δείλαιος· ἐκ τοῦ σκίμποδος
 δάκνουσί μ’ ἐξέρποντες οἱ Κορίνθιοι,
 καὶ τὰς πλευράς δαρδάπτουσι
 καὶ τὴν ψυχὴν ἐκπίνουσι
 καὶ τοὺς ὄρχεις ἐξέλκουσι
 καὶ τὸν προωκτὸν διορύττουσι,
 καὶ μ’ ἀπολοῦσι.

Oh wretched me, I’m dying! Corinthians are creeping out from the couch and biting me,
 and they devour my sides,
 and they suck out my life,
 and they drag out my testicles,
 and they dig through my arse,
 and kill me!

Strepsiades’ lines here are bacchiac, which Sommerstein identifies as a ‘rare metre in comedy used only for special effects,’ perhaps to imitate a tragic chorus’ address to a suffering hero.³⁸

36 See Rothwell 2007: 91 on animal Choruses in comedy: ‘No animal chorus was “pure”; in other words, all had at least some hybrid quality, combining human and animal features.’ See also his earlier comment that Greeks were especially receptive to the blurring of boundaries between species (75). Cf. Alexandridis 2009: 278 for a discussion of human/animal blending and transformation in Classical Athenian vase painting: ‘The bodies of transformed humans are shown either wrapped in animal skin (the outside of an animal) or as a mixture of animal and human body parts, thus suggesting a mixture of both natures.’

37 First produced in 422/1 BCE. For our version as a later revision of the play, see Dover 1968: lxxx-xcviii. For overviews of Aristophanes’ career, see Olson 1998: xxi-xxiv and Dover 1993: 1-5.

38 Sommerstein 1982: 198; so Dover 1968: 188.

Dover also remarks that the ‘[c]ombination of symmetry and assonance to this degree is unusual.’³⁹ Aristophanes’ anatomical vocabulary mirrors the unusual metre. Playing with tragic descriptions of corporeal suffering, he overemphasizes body parts and, for the amusement of the audience, finishes with the untragic terms ὄρχεις (*testicles*) and πρωκτός (*arse*).⁴⁰ The result is a mixed verbal body, a hybrid one that contains elements of both tragedy and comedy.

Both Epicharmus’ and Aristophanes’ list of anatomical parts obscure any sense of a whole body through a buildup of disjointed pieces. The resulting impression is one of excess that confuses the object under investigation instead of clarifying it. This technique is used several times in comedy.⁴¹ It is common in this type of joke, which ostensibly aims at delivering a complete and accurate account of a subject, to have it end with something unexpected (*paraprosdokian*) that undermines the seriousness of all that preceded it.

6.3. The hybrid body: technical terms

Anatomical vocabulary from medicine provided comic authors with another means to problematize the body in humorous ways, either in lists as seen above or independently as

39 Dover 1968: 188. He cites Hermippus fr. 47 and Eupolis fr. 163 as other examples from comedy.

40 The term πρωκτός (*arse*) is almost exclusively restricted to comedy. It first appears in the elegiac poetry of Archilochus (fr. 187) and the iambics of Hipponax (fr. 104), but then only in comedy, references to comedy, or glosses, e.g. Cratin. fr. 339 K.-A.; Ar. *Ach.* 83, *Eq.* 394, *Nu.* 164; Pl. Com. fr. 189. K.-A.; Anaxand. fr. 42 K.-A.; Eub. fr. 106 K.-A. ὄρχεις (*testicles*) was evidently also a vulgar term in Classical Athenian speech, yet had wider literary usage. It appears several times in Aristophanes (e.g. *Ly.* 963, *Pax* 758, *V.* 1035.), but also later in Xenophon, Demosthenes, and Aristotle, among others (Xen. *Eq.* 1.15; Dem. *In Con.* 39; frequently in Arist., e.g. *HA* 540b, *GA* 716a). The Ionic form ὄρχιες is also seen at Hdt. 4.109, as well as at Hp. *Epid.* 7.52, *Genit.* 2, *Int.* 47, and *Prog.* 9.

41 For appearances of similar listings elsewhere, see Ar. *Nu.* 317-22 (listing jargon from contemporary interests in natural philosophy and rhetoric); *Ach.* 1174-81 (a messenger describing the sprained ankle [σφυρόν] and injured head [κεφαλή] of Lamachus, notable here also for its account of how to treat an injured joint); *Pl.* 559-61 (Poverty comparing the mental and physical attributes [καὶ τὴν γνώμην καὶ τὴν ἰδέαν] that a human develops with him to those one develops with Wealth). Excessive listing of food in particular – many instances of which involve terminology used for both animal and human parts – appears to have been a prominent feature within comedy, e.g. Ar. fr. 520 K.-A.; Pherecr. fr. 50 K.-A.; Eub. fr. 63 K.-A.; Philyll. fr. 12 K.-A.; Anaxand. fr. 42 K.-A. A fragment from Antiphanes’ *Cyclops* (fr. 130 K.-A.) is especially interesting for its structure of naming the animal first, followed by the part served: γόγγρου κεφαλή, βατράχου γαστήρ, θύννου λαγόνες, βατίδος νῶτον, κέστρας ὀσφύς, ψήττας κίσχος, κτλ. ‘...the head of a conger-eel, the belly of a frog, the flanks of a tunny-fish, the back of a ray, the loins of a bicuda (*fish*), the *kischos* (morsel?) of a flat-fish, etc.’

punchlines to jokes. Comic appropriation of such terms fall into two classes: words that imitate tragic diction (sometimes already in the Homeric epics, but used in ways that reflect contemporary medical interest in the body); and words that can be connected more closely to medical language. In both cases, there is the potential for comic inversion, or carnivalization: the serious (high-style) subject matters of tragedy and of medicine are placed within a comic (low-style) world that produce not only a momentary hybrid of genres, but also hybrid bodies that are mapped upon the generic comic body.⁴²

6.3.1. The torso

Comic authors' use of technical vocabulary reflects Athenian society's growing familiarity with medical discourse about divisions of the body. For example, we have seen in the previous chapter how Aristophanes played with the technical anatomical term *θώραξ* (*upper torso*), which Philocleon confused with its primary meaning of 'breastplate' (*V.* 1195). Compared to tragic authors, though, comic playwrights placed greater emphasis on the lower parts, the belly and the abdomen.⁴³ These parts, associated with sex, feasting, and defecation, were excellent material for the comic stage.

At times, comic playwrights' interest in the parts of the lower torso overlapped those of physicians. For example, Aristophanes in *Assemblywomen* (*ca.* 391 BCE) has the character Blepyrus call for a doctor to treat his digestive problems (363-65):⁴⁴

τίς ἄν οὖν ἰατρόν μοι μετέλθοι, καὶ τίνα;
 τίς τῶν κατὰ πρωκτὸν δεινός ἐστι τὴν τέχνην;
 ἄρ' οἶδ' Ἀμύνων;

42 See Silk 1990 for a useful starting-point for discussion of tragic parody in Old Comedy. He emphasizes Aristophanes' particular interests in creating hybrids of the comedic low style and the high style of tragedy, which appear to be more pronounced than in earlier comic theatre.

43 For example *γαστήρ* (*belly*) is rare in tragedy: *A. Ag.* 726, *S.* fr. 564 Radt, *E. Ion* 15 (the womb); *S.* fr. 848 Radt, *S. Ph.* 287 and 711, *E.* fr. 49 Nauck, *Supp.* 864 (in the context of food or gluttony); *E. Ph.* 1411 (battle injury).

44 See Sommerstein 1998a: 1-7 for the dating of the play.

Someone fetch a doctor for me, but who? Who among them is an expert in the science of the asshole? Perhaps Amynon?

Notably, the term *πρωκτός* (*asshole*, i.e. *anus*) is restricted to comic theatre in the Classical period.⁴⁵ Its absence from medical writings suggests that it was a vulgar term and that Aristophanes was subtly having fun with esteemed Athenian physicians' unusual attention to specific (and unpleasant) parts of the body, here their focus on the site of defecation.⁴⁶ Words for the belly also occasionally appear in comedy, and would have directed attention to the padded stomachs of the characters. The usual term in comedy for this area is *γαστήρ* (*belly*);⁴⁷ however, two uncommon terms appear to have some medical connections: *κάτω κοιλία* (*lower abdomen*) and *ἦτρον* (*abdomen*). Both words appear in non-tragic contexts, and suggest a direct appropriation of medical vocabulary that the audience would be able to appreciate.

κάτω κοιλία: lower abdomen, Ar. Ra. 495

In comedy, the term *κοιλία* (from the adjective *κοῖλος*, *hollow*) usually refers to the stomach of animals.⁴⁸ By association, the plural form comes to mean the intestines, which were used for sausage.⁴⁹ Although the term is used regularly in the HC in the sense of 'belly' and 'intestines',⁵⁰

45 E.g. Cratin. fr. 339 K.-A., Ar. *Ach.* 83, *V.* 1035, *Pax* 758. The common term for the anus in the HC is ἔδρη, e.g. *Morb.* 2.14, *Loc. Hom.* 47, *Fist.* 7, *Nat. Mul.* 30, and *Mul.* 227.

46 Cf. Ar. *Pl.* 706 where the character Callicles calls Asclepius (the patron god of physicians) a 'shit-eater' (σκατοφάγος), alluding to physicians' practices of examining and tasting the bodily waste of patients. As a scholiast (*R.V.P.*) *ad loc.* writes: τὸ σκατοφάγον λέγει, ἢ διότι οἱ ἰατροὶ ἐκ τοῦ τὰ σωμάτων κενώματα βλέπειν καὶ οὐρα τοὺς μισθοὺς λαμβάνουσιν. ἢ ὅτι ὁ τῆς ἰατρικῆς ἡγεμῶν Ἱπποκράτης ἀνθρωπίνων κόπρων, ὡς φασιν, ἐγεύσατο, βουλόμενος περὶ τίνος νοσοῦντος μαθεῖν, ἢ ἄρα ζήσεται ἢ τεθνήξεται. 'He says "shit-eater," either because physicians are paid to look at bodily evacuations and urine, or because Hippocrates, the master of medicine, allegedly tasted human feces to learn the type of ailment [from which a patient suffers], [thereby learning] whether he will live or die.' For Hippocratic examples of this practice see *Epid.* 4.27, and *Prog.* 11 and 12 for fuller accounts.

47 E.g. Ar. *Ach.* 733, *Eq.* 273, 454, *Lys.* 1083, *Nu.* 160 (of a gnat), *Ra.* 663, 1095, *V.* 1020, 1529; Cratin. fr. 349 K.-A.; Pherecr. fr. 172 K.-A.; Pl. *Com.* fr. 243 K.-A.; Epicrates fr. 5 K.-A. (cf. E. *Cyc.* 220, 326, 335, and 506). In addition, we see variants used to describe the attributes of characters, e.g. Ar. *Av.* 1604 γάστρις (*glutton*), Ar. *Pl.* 560 γαστροῦδης (*pot-bellied*), Cratin. fr. 428 K.-A. γαστροχάρυβδης (*with a gulf of a belly*).

48 E.g. Ar. *Eq.* 280 (of an ox), *V.* 794 (of a rooster, but a human form is suggested).

49 See Ar. *Eq.* 301, 488; Antiphanes fr. 248 K.-A.; but for the singular with the same meaning, Ar. *Eq.* 356.

50 E.g. *Aph.* 4.65, *Coac.* 194, *Aër.* 11, *Aff.* 47, *Art.* 48 (*belly*); *Aph.* 4.73, *Coac.* 295, *Aër.* 19, *Epid.* 1.2.4, *VM* 11 (*intestines*).

it only appears in two Athenian works outside of comedy before Aristotle, both for humans.⁵¹ Only twice in comedy is the word used for the human body. The first is in Aristophanes' *Knights* (280) where the Sausage-seller, using the language of his trade, calls Paphagonian's belly empty (κενῆ τῆ κοιλίᾳ).

The word's second appearance in *Frogs* (405 BCE), however, seems to be used specifically in a medical context.⁵² Dionysus feels faint (ὠρακιῶ: 481) after being frightened by the monster Echidna that lurks in the underworld. He then calls to his slave Xanthias for aid (482-86):

Δι. οἶσε πρὸς τὴν καρδίαν μου σπογγιάν.
Χα. ἰδού, λαβέ, προσθοῦ. ποῦ ἴστιν; ὦ χρυσοὶ θεοί,
ἐνταῦθ' ἔχεις τὴν καρδίαν;
Δι. δείσασα γὰρ
εἰς τὴν κάτω μου κοιλίαν καθείρπυσεν.
Χα. ὦ δειλότατε θεῶν σὺ κἀνθρώπων.

Dionysus: Bring a sponge to my heart.

Xanthias: There it is; put it on.

(Dionysus moves the sponge to his groin)

Where is it? Golden gods! That's where you have your heart?

D.: Yes, I was afraid, so it crept to my lower abdomen.

X.: Oh, you're the worst of gods *and* men!

The term κοιλίᾳ by itself has correctly been rejected as a technical term by Willi.⁵³ But the addition of the adverb κάτω (*lower*) provides a more specific location. This terminology for dividing the torso into upper (ἄνω) and lower (κάτω) regions is used very frequently within the

51 Th. 2.49 (in his description of the plague of Athens) and Pl. *Ti.* 73a3, 85e10 *et passim* (in his description of the internal body).

52 Briefly noted by Miller 1945: 81.

53 Willi 2003: 82.

HC.⁵⁴ Outside of medical writings, the term appears only here here and in Plato's *Timaeus* before Aristotle.⁵⁵

The context of the *Frogs* passage provides two further reasons for suspecting that Aristophanes is purposefully using uncommon medical language for describing Dionysus' (feigned) affliction. Dionysus first asks for a sponge because he is feeling faint. The term used, ὠρακιῶ, is limited to three instances in Classical literature, all of them in drama. It appears here in Aristophanes and again in *Peace* (702). Its only other appearance in classical Greek literature is in a line fragment from Sophocles (fr. 120 Radt) that preserves a meaning similar to here in the *Frogs*: ὠρακιᾶσαι θλιβομένης τῆς καρδίας ('fainting with a restrained heart').⁵⁶ In both instances, something affecting the heart has caused a character to swoon.⁵⁷ The sponge (σπογγιά) that Dionysus requests is a common tool for physicians.⁵⁸ Although there does not seem to be a parallel example in the HC where a sponge is used in the treatment of a fainting spell, the sponge appears within the gynaecological treatises in descriptions of how to ease abdominal discomfort.⁵⁹

Aristophanes might also be playing with the audience's understanding of the heart's (καρδία) location within the body. Some Hippocratic texts themselves might have mistakenly

54 E.g. *Epid.* 5.18: ὀδύνη ἴσχει ἰσχυρὴ τὴν κάτω κοιλίην ('a strong pain gripped the lower abdomen'); *VC* 20: χρὴ τὴν κάτω κοιλίην ὑποκαθῆραι φαρμάκῳ, ὃ τι χολὴν ἄγει ('one must purge the lower abdomen with a drug that produces bile.');

Flat. 7: ἐμφραχθείσης δὲ τῆς κάτω κοιλίης, ἐς ὅλον τὸ σῶμα διέδραμον αἱ φύσαι ('When the lower abdomen is obstructed, flatulence is built up in the entire body.').

55 *Ti.* 73a2, 85e9.

56 Fr. 120 Radt. Σ *ad Ra.* 481 notes that the line came from Sophocles' satyr play *Amphiaraios* (τοῦτο δὲ Σοφοκλῆς εἶπεν ἐν Ἀμφιαράῳ σατυρικῶ). See Lloyd-Jones 1996: 46-47 for the eccentric view that the play might in fact have been a tragedy.

57 For an example in the HC of faintness being caused by an affected heart, see *Morb.* 2.5: ἀψυχέει δὲ ὅταν προσίστηται πρὸς τὴν καρδίην φλέγμα ἢ χολή ('[The patient] swoons when phlegm or bile comes upon the heart'). This account, however, is mentioned as a symptom of the more serious problem of infection (lit. *rotting*) of the brain (σφακελισμὸς ἐγκεφάλου).

58 For examples in the HC see *Med.* 2 (for trauma); *Haem.* 2 (for open sores); *Int.* 23 (trepanation of the chest for the treatment of dropsy).

59 E.g. *Mul.* 166, describing the application of a sponge to the parts below the navel (τὰ κάτω τοῦ ὀμφαλοῦ). Cf. *Mul.* 177; *Nat. Mul.* 90, 105; for its use in the treatment of hemorrhoids, see *Haem.* 2.

thought the organ was positioned lower in the body than it actually was,⁶⁰ a confusion that was mainly because of the heart's understood association with heartburn (καρδιαλγία).

Aristophanes himself uses the verb καρδίωσσω ('to have heartburn/stomach ache,' s.v. LSJ) to describe the condition (fr. 377 K-A).⁶¹ This uncertainty about the organ's location in the body would help to explain Xanthias' surprise at where Dionysus moves the sponge, ποῦ ὅστιν...ἐνταῦθ' ἔχεις τὴν καρδίαν; ('Where is it?...That's where your heart is?'). Dionysus is not applying it to the upper chest, but lower down where indigestion would be felt. Both the uncommonness of κάτω κοιλία outside of medical writings and the context of therapy within this passage suggest good reason to attribute at least some of the colour of Aristophanes' joke here to clinical humour.

ἦτρον: abdomen, Ar. Th. 509

Another term that Aristophanes uses for the abdominal area is ἦτρον. The word is derived from the epic ἦτρον, which appears to have been both a psychic and a material part of the body (possibly the heart, although its precise physical meaning remains unclear).⁶² The derivative ἦτρον – likely because of uncertainty about the term's meaning in classical antiquity – took on the meaning of the abdomen, usually the lower part of it (LSJ, s.v.). The sense of the term therefore overlaps that of κάτω κοιλία discussed above. ἦτρον appears often in the HC⁶³ –

60 See p. 113 above, esp. this criticism at *Morb.* 4.36.

61 See further Southard 1971: 246. Starkie 1909 at *Ach.* 12 suggests that καρδία might also mean 'stomach.' Here Dicaeopolis recalls for the audience his unhappy surprise that a play of Theognis was to be performed instead of one of Aeschylus': πῶς τοῦτ' ἔσειέ μου δοκεῖς τὴν καρδίαν; ('can you understand how this shook my *kardia*?').

62 See section 2.5.2 above for a discussion of the use of this term in the Homeric epics.

63 E.g. *Epid.* 2.4.1 (in relation to the chest [στῆθος]); *Aph.* 2.35 (describing diseases 'around the navel and the abdomen' [τὰ περὶ τὸν ὀμφαλὸν καὶ τὸ ἦτρον]).

most notably in gynaecological and obstetrical works⁶⁴ – but only a few times outside of it before Aristotle.⁶⁵ This may suggest at least a quasi-medical sense of the term.

The word appears once in comedy at *Thesmophoriazusae* 509 (411 BCE). In this passage Mnesilochus, having insinuated himself into the women's festival wearing a female disguise, pretends to confess the many cases of infidelity and trickery by women that he has heard. Among these is one story about a woman who, it seems, could not conceive with her husband. After telling her husband that she was in labour for ten days, she thus devised a plan to have an old woman obtain a baby and bring it into the house. The wife next tells her husband to fetch some drugs to hasten delivery (ὠκυτόκα). The old woman returns with the infant in a jar, filling its mouth with honey so that it would not cry. The wife tells her husband that he should leave, because she thinks she is about to have the baby: she can 'feel it kicking the belly...of the pot' (τὸ γὰρ ἦτρον τῆς χύτρας ἐλάκτισεν). The joke works because pots had labels that regularly overlapped with human anatomy: they had necks (τράχηλος: *BCH* 35.286; *Hero. Spir.* 1.19; ἴσθμιον: *Suda s.v.*), ears (ὠτὰ: *Il.* 11.633), and – as we see here – bellies (cf. γαστήρ, *Cratin.* 202 K.-A.). But the specific use of the word ἦτρον applied to containers is nowhere else attested in the Archaic or Classical periods.

64 E.g. *Mul.* 2 (describing the area most afflicted with pain in instances when the womb [μήτρα] is filled with blood); *Superfet.* 10 (describing a foetus that had died in the womb, leaving the ἦτρον cold).

65 *Xen. Eq.* 12.4 and *An.* 4.7.15 (describing the area protected below the breastplate [θώραξι]); *Pl. Phd.* 118a5 (in a description of the area affecting Socrates after drinking hellebore at his execution). The word is used again by Demosthenes (54.11) in an explicitly medical context. In the case against a certain Conon for attacking Ariston, Ariston relates the report of his doctor (ἰατρός) using the anatomical and disease vocabulary of the profession. After the beating, the pain in Ariston's face (προσώπον) did not concern the doctor very much; however, reoccurring fever and pain throughout his entire body – especially his ribs (πλευρά) and abdomen (ἦτρον) – and Ariston's inability to eat had him worried. The doctor informed Ariston later that if there had not been a hemorrhage (lit. 'a self-purification/purgation of blood,' κάθαρσις αἵματος αὐτομάτη) that eased the buildup of fluid, he would have died of suppuration (ἔμπυος), the buildup of pus in the lungs. The term also appears once in reference to an anatomical votive in an inventory list from the temple of Asclepius in Athens (*IG* II² 1534, c. 275 BCE).

As Austin and Olson remark, ‘[t]he joke is complicated.’⁶⁶ Willi quickly dismisses ἦτρον as being a part of the body, and classifies it here as a reference to, ‘the “belly” of a pot, not to human anatomy’;⁶⁷ however, this comment overlooks the pun contained within the passage. Aristophanes is emphatically playing with the primary (anatomical) meaning of the word and its secondary derivative application to pottery. The woman in Mnesilochus’ story is feigning to be pregnant, and thus the ἦτρον in one sense does apply to her lower belly. The joke is that it is not, as one would expect, her belly that the child is kicking, but rather the pot. Austin and Olson are correct in concluding (contrary to a scholion) that ἦτρον here does not refer to the interior ‘womb’ of the woman, but rather to her exterior.⁶⁸ They further cite Moeris (η 14) who suggests that ἦτρον is peculiar to Attic Greek,⁶⁹ a variant of the more common Greek term ὑπογάστριον,⁷⁰ but the frequent appearance of the word in the HC suggest otherwise (unless one makes the difficult leap in supposing that this Atticism somehow, through authorship or appropriation, was added to these Ionic writings).

As with many of his jokes, the humour in these two passages is derived from ambiguity in meaning. The ‘belly’ (ἦτρον) is confused with a pot, and ‘heart’ (καρδία) with what we call the ‘stomach.’ The audience would have expected either one or the other, and would have been surprised that their expectations were not satisfied. Furthermore, the use of the expression κάτω

⁶⁶ Austin and Olson 2004 *ad loc.*

⁶⁷ Willi 2003: 82 n. 71.

⁶⁸ Austin and Olson 2004 *ad loc.* See Σ^R: ἦτρον· τὸ κάλυμμα τῆς μήτρας· ὁ καλοῦμεν ἔλυτρον (‘*hetron*: the membrane of the womb, which we call “the sheath”’). Murray 1920 *ad loc.* accepts the scholiast’s remark at face value.

⁶⁹ ἦτρον· τὸν ὑπὸ τῷ ὀμφαλῷ τόπον Ἀττικοί· ὑπογάστριον Ἕλληνες. (‘*hetron*: the area around the navel, Attic; Greek *hypogastrion*.’). Cf. Rufus *Onom.* 100: τὸ δὲ ὑποκάτω τοῦ ὀμφαλοῦ, ὑπογάστριον καὶ ἦτρον (‘the region below the navel: the *hypogastrion* and *hetron*’).

⁷⁰ The term ὑπογάστριον appears several times in Attic comedy, which possibly suggests that it was the more common of the two in Athens. It is used most often for the belly of fish. See for examples Strattis fr. 32 K.-A.; Ar. fr. 380 K.-A.; Eriphus fr. 3 K.-A. Aristophanes uses the word at *V.* 195 in a pun for stealing the contents of an old woman’s money bag.

κοιλία appears to be an explicit allusion to clinical treatment. Dionysus treats his fainting spell much like a doctor would, and uses proper vocabulary to explain the process.

6.3.2. The interior body

Descriptions of internal parts of bodies are a regular feature in comedy; however, these are usually restricted to edible animal parts. The common term for flesh, κρέας, is almost exclusively used for animals.⁷¹ Only in Aristophanes' *Knights* (424 BCE) is the term used for humans. Here the protagonist, the sausage seller Agoracritus, is called a 'clever piece of flesh' (ὦ δεξιώτατον κρέας: 421), a suitable label for a hawker of meat.⁷² Familiar organs – the lungs (πλεύμονες), liver (ἥπαρ), kidneys (νεφροί), and spleen (σπλήν) – are also mentioned, but with little detail and again often in reference to animal parts.⁷³ The heart (καρδία) is an exception, since it mainly appears as a psychological organ in humans.⁷⁴ Terms for guts are also common in descriptions of animal parts,⁷⁵ and like in the Homeric epics σπλάγχνα (*offal*) is always used in comedy for food.⁷⁶ Although these common terms do not suggest any medical influences, they do illustrate the liberty that comic poets had to describe the various internal parts of bodies, both of humans and of animals.

71 E.g. Epich. fr. 122 K.-A. (of a dolphin); Ar. *Ach.* 1106 (of a dove), *V.* 363 (of a weasel).

72 Forms of the term σάρξ are used twice to describe a person's 'fleshy' appearance (σαρκίνη γυνή, Eup. fr. 417 K.-A.; and ἄνδρα σάρκινον, Ar. fr. 728 K.-A.); and once to describe a person's white complexion (λευκαυγῆ...σάρκος, Antiph. fr. 216 K.-A.).

73 E.g. πλεύμονες: (appearing only 5 times in comedy, and mostly in the context of humans) Ar. *Pax* 1069, *Ly.* 367, *Ra.* 474, 829 (human); Eub. fr. 23 K.-A. (animal); ἥπαρ: Pherecr. fr. 50 K.-A.; Ar. fr. 333 K.-A., Eub. fr. 63 K.-A. (animal); Eub. fr. 100 K.-A. (human); νεφροί: (used exclusively in comedy as a slang for testes) Ar. *Ly.* 962, *Ra.* 475, 1280, Phillipid. fr. 5 K.-A.; σπλήν: Ar. fr. 520 K.-A., Antiph. fr. 23 K.-A., Alex. fr. 275 K.-A. (animal); Ar. *Th.* 3 (human).

74 See Southard 1971: 246. For καρδία as the seat of emotion, see Pherecr. fr. 284 K.-A.; Ar. *Ach.* 1, *Lys.* 9, *Ra.* 54, *Th.* 869, *V.* 375; Antiph. fr. 262 K.-A. For references to the anatomical heart, see Ar. *Ach.* 12 and Eub. fr. 94 K.-A. for the parts of a sacrificial animal.

75 E.g. κοιλία (*intestines*): Ar. *Eq.* 160, 488, *Pl.* 1169; Antiph. 248 K.-A.; Alex. fr. 103 K.-A.; χορδή (*intestines*): Cratin. fr. 205 K.-A.; Pherecr. fr. 137 K.-A.; Ar. fr. 702 K.-A., *Ach.* 1040, *Ra.* 338-39; Antiph. fr. 73 K.-A.; Axionic. fr. 8 K.-A.; φύσκη (*large intestine*): Cratin. fr. 175 K.-A.; Pherecr. fr. 113 K.-A.; Ar. *Eq.* 364; *Pl. Com.* fr. 17 K.-A.

76 E.g. Ar. *Eq.* 410, *N.* 1036, *V.* 654, *Pax* 1092, *Av.* 519; Eub. fr. 75 K.-A. The sole exception when the term is used for humans is at Ar. *Ra.* 473 where Dionysus describes the underworld monster Echidna's meal.

Comic poets occasionally used terms for internal body parts that had closer connections to technical language and concepts. I focus on five of the most compelling examples: σφόνδυλοι (*vertebrae*), κοτυληδών (*hip socket*), ἴνες (*sinews*), ψόαι (*loin muscles*), and φλέβες (*veins*). In these cases, comic playwrights use uncommon vocabulary to bring hidden internal body parts to the foreground, usually as a means to emphasize the absurdity of a scene. Two of these words, ἴνες and ψόαι, refer to animals parts; however, their contexts suggest parallels with medical terminology for the human body. Hippocratic authors seem to have made extensive use of animals in their mapping of the internal human body, which resulted in a shared language.⁷⁷ I suggest that comedy could exploit this connection in a way that poked fun at the medical profession (either directly or indirectly through parody of tragedy). Like Epicharmus' Theagenes quoted above, whose appearance was likened to various animals, these shared labels between humans and animals complicate the boundaries between us and them.

σφονδύλος: spine, and κοτυληδών: hip socket, Ar. V. 1489 and 1495

At the very end of *Wasps* (422 BCE), the old man Philocleon emerges from his house. The slave Xanthius reports that he is drunk and that he has been imitating the old dances of the tragic poets Thespis and Phrynichus the entire previous night (1474-81).⁷⁸ It was common in comedy for Chorus of old men to enter the stage with a slow dance.⁷⁹ Philocleon, however, rejuvenated after experiencing a night out at a symposium with his son Bdelycleon, describes his exaggerated

77 See esp. Lloyd 1985 for the practice in Greek science to appropriate both high and low language for their technical vocabulary. Included in this class of 'low' language are terms derived from animals. For the Greek idea of animals as defective versions of humans (particularly in the works of Aristotle), see Lloyd 1983: 40-42.

78 For the identities of Thespis (whose first production is dated to 535/34 BCE) and Phrynichus (*fl. ca.* 510 – *ca.* 470 BCE), see Storey and Allan 2008: 76 and 91-92.

79 Csapo 2010: 134.

youthful dance from the house (1487-89):⁸⁰

πλευρὰν λυγίσαντος ὑπὸ ρύμης·
οἶον μυκτῆρ μὲν καὶ
σφόνδυλος ἀχει.

How my nostril wheezes and my spine creaks from the twisting force of my sides!

A few lines later Philocleon continues (1494-95):

νῦν γὰρ ἐν ἄρθροις τοῖς ἡμετέροις
στρέφεται χαλαρὰ κοτυληδῶν.

Now the loose hip socket turns in our joints.

We have already seen that the old man was confused about his son Bdelycleon's use of the term θώραξ (more commonly meaning 'breastplate') in the technical sense of 'torso' (1194). In this scene it appears that Philocleon is attempting to show his newly-acquired familiarity with the language of clever people (σοφοί, 1196). He uses similar anatomical vocabulary together with the excessive listing of parts (πλευρά, μυκτῆρ, σφόνδυλος, ἄρθροι, κοτυληδῶν) to increase the comic effect of his dance: not only is he imitating the movements of a youthful character, but he is also using novel technical words to describe them. Philocleon's lines are likely adapted from an unknown tragedy,⁸¹ so his vocabulary here probably should be interpreted as tragic appropriation of unusual vocabulary – specifically the terms σφόνδυλος and κοτυληδῶν – rather than a direct imitation of technical medical language.

80 Such rejuvenation of characters is a common theme in Aristophanes' early plays, e.g. *Ach.* (425 BCE) and *Eq.* (424 BCE). For discussions of the types of dramatic dance that Philocleon imitates (apparently a mixture of comic and tragic), see Slater 2002: 108-110 and Borthwick 1968. See Roos 1951: 21-76 (convincingly rejected by MacDowell 1971: 323) for his argument that Philocleon is not imitating dramatic dance *per se*, but rather that performed by hetairai, which he interprets as Aristophanes' way of criticizing the debased dance in contemporary tragedy.

81 Sommerstein 1983: 244, MacDowell 1971: 322.

Both σφόνδυλος and κοτυληδών are rare outside of medical writings.⁸² The variant σφονδύλιον first appears at *Iliad* 20.483 (*hapax*) in the description of Deucalion's decapitation by Achilles. It is mostly restricted to poetic language in classical Athenian writings. Euripides uses the word twice: for the vertebrae of a sacrificial calf (*El.* 841);⁸³ and again for the vertebrae of Polynices as he is stabbed by his brother Eteocles (*Ph.* 1413). The comic poet Pherecrates, an older contemporary of Aristophanes, also uses it in a description of a sacrificial offering (fr. 28 K.-A.). The term reappears in a technical sense for the human body in Plato's *Timaeus* where he describes the flow of marrow (μυελός) into the spine from the head (74a1-3). Taylor in his commentary on these lines remarks that the term σφόνδυλος (Ionic σπόνδυλος) is 'the standing technical name for a vertebra,' a claim that is supported by its frequent appearance in the HC.⁸⁴ ῥάχις appears to have been the more common name for the vertebrae (i.e. the spine) in Attic Greek.⁸⁵

The term κοτυληδών (*hip socket*) appears even less frequently. The simple form κοτύλη (lit. 'cup') is used at *Iliad* 5.306 in an unusual anatomical sense: κοτύλην δέ τέ μιν καλέουσι ('they call it [*viz.* the hip joint] "cup").⁸⁶ κοτυληδών, though, is used specifically for things that are cup-like, including suckers (e.g. of an octopus)⁸⁷ and, in technical writings, the cotyledons (vascular connections of the uterus and the placenta).⁸⁸ The word in the sense of 'hip socket' is restricted to a handful of technical writings in the Classical period, which suggests a limited

82 Miller 1945 has identified these terms in passing as possibly derived from medicine.

83 Guardasole 2000: 90 has commented on the possible medical terminology used in this passage. She observes in passing that the term σφονδύλος (*vertebra*) appears widely (*ampiamente attestato*) in both medical and non-medical writings in the 5th century. The examples that follow perhaps suggest otherwise.

84 E.g. *Art.* 41, *Epid.* 2.2.24, *Morb.* 2.26, *Prorrh.* 1.87, *Loc. Hom.* 6.

85 E.g. A. *Pr.* 713, *Eum.* 190; S. fr. 1088 Radt (cf. ῥαχίζειν, 'to cut through the spine,' *Aj.* 56); E. *Cyc.* 643; Ar. *Lys.* 314; Xen. *Eq.* 7.2 (of a horse); Arist. *HA* 516a11.

86 For this use of the word in the HC, see *Loc. Hom.* 6 and *Art.* 8.

87 *Od.* 5.433, Arist. *HA* 524a2.

88 *Hp. Nat. Mul.* 17, *Aph.* 5.45. Aristotle notes at *GA* 745b33 that the 'so-called *cotyledons*' (αἱ καλουμέναι κοτυληδόνες) of the uterus are closely-packed blood vessels.

medical context for this meaning of the word.⁸⁹ Philocleon, however, has used the term incorrectly, possibly misquoting a tragic line:⁹⁰ the hip socket itself does not turn (στρέφειν), but rather the ball of the femur (κεφαλή / ἐπίφυσις) inside the socket.⁹¹ The mistake presumably would have been easily recognized by spectators regardless of their familiarity with anatomical language, since a ‘cup’ simply cannot move in the way that he describes.⁹²

Along with his ecstatic dance, Philocleon’s mimicry of contemporary tragic and technical language for the body emphasizes his final rejuvenation at the play’s conclusion. He has ostensibly become a man of the world, steeped in the vocabulary of both tragedy and perhaps science; however, his excessive use of these words emphasizes his awkward appropriation of this recently acquired knowledge, i.e. his incorrect use of anatomical jargon (κοτυληδών). Despite his newly found exuberance, his transformation is incomplete: he remains a ‘late learner’ (ὄψιμαθής), an old man who only tries to appear youthful through pedantic vocabulary.⁹³

ἴνες: sinew/fasciae, Ar. Pax 86

We see a similar parody of unusual and apparently technical vocabulary from tragedy in Aristophanes’s *Peace*, which was produced the following year (421 BCE). The term ἴνες (*sinews/fascia*) appears only here in comedy where it is properly used for Trygaeus’ beetle that he rides supported by the crane above the stage (82-86):

ἥσυχος ἥσυχος, ἡρέμα, κάνθων·
μή μοι σοβαρὸς χῶρει λίαν
εὐθύς ἀπ’ ἀρχῆς ῥώμη πίσυνος,

89 Only twice in the HC: *Int.* 18 and *Oss.* 3 and once again at Arist. *HA* 516a35. Galen considered it a Hippocratic word, and felt that it was unusual enough to require a comment in his *Glossary of Hippocratic Terms* (19.144 K): κοτυλίδα· τὴν κοτύλην τοῦ ἰσχίου (*kotulēdōn*: the “cup” of the hip’).

90 Observed by MacDowell 1971 *ad loc.*

91 See *Mochl.* 1 for a description of this process.

92 *Pace* Willi 2003: 82, who argues against a medical sense for the term, since ‘the scene does not suggest in any way that Philocleon appear as an incompetent quack because of his mistaken use of terminology.’

93 For similar opinions about late learners’ awkward or incorrect appropriation of contemporary vocabulary, see Pl. *Sph.* 251b (philosophical language), Thphr. *Char.* 27 (poetic recitation), and Hp. *Praec.* 13 (medical language).

πρὶν ἂν ἰδίης καὶ διαλύσης
ἄρθρων ἰνας πτερύγων ῥύμη.

Softly, softly, carefully, beetle! Don't move too fast right away in your hurry, trusting too much in your strength. Wait until you sweat and relax the sinews of your joints with the beating of your wings.

The scene is a parody of Euripides' *Bellerophon*,⁹⁴ which at some point represented the hero riding the winged horse Pegasus.⁹⁵ Like Trygaeus' shabby appearance (mirroring Euripides' hero),⁹⁶ the dung beetle is a grotesque comic representation.⁹⁷ Aristophanes' language both has fun with Euripides' style and, through the intersection of poetic and technical vocabulary, emphasizes the absurdity of the scene.

The term is Homeric, but it is used here in a different sense. In the Homeric poems the term ἰνες is used to describe the fasciae (sheet-tendons) of desiccated corpses.⁹⁸ It next appears in a line fragment of Archilochus where the sinews of limbs are severed,⁹⁹ and in a metaphorical sense at Pindar's *Isthmia* 8.52.¹⁰⁰ As explored in our discussion of the use of this term in the Homeric epics,¹⁰¹ ἰνες as *sinews* has been identified as a concretized plural form of ἴς, or *strength* (cf. Latin *vis*).¹⁰² The exact definition of the term in the Homeric poems is problematic, as the physical meaning 'tendons' appears to overlap with the abstract 'strength.'

94 There is no fixed date for the production of this *Bellerophon*, although a range between the mid-430s and 426 BCE has been suggested (Olson 1998: xxxii). For both the mythological and the literary backgrounds of Euripides' play, see Olson 1998: xxxii-xxxviii. See further Sommerstein 1985: xvi-xvii and MacDowell 1995: 180-98.

95 Σ^{VLh} in *Peace* preserves the line: ἄγ' ὦ φίλον μοι Πηγάσου πτερόν. 'Come, that which is dear to me, the wing of Pegasus.'

96 See Ar. *Ach.* 426-29 and further Olson 1998: xxxii for the shabby appearance of Euripides' Bellerophon; on Aristophanes' parody of the play in *Peace* see further Rau 1967: 87-97.

97 So Whitman 1964: 106-9.

98 *Il.* 3.191, *Od.* 11.219.

99 Fr. 222: ἰνας δὲ μελέων <τῶν μέσων> ἀπέθρισε ('He cut the sinews mid-limb').

100 A description of how Achilles 'cut the sinews of Troy with his spear' (Τροίας / ἰνας ἑκταμῶν δορί).

101 See section 2.5.1 above.

102 Frisk, s.v. ἰνες.

Although the term was already used in epic poetry, its specific use in *Peace* reflects medical notions about what the ἴνες are, although there appears to be little consistency of meaning of the term within the HC. The author of *Breaths* (12) holds a similar understanding of the ἴνες as is seen in the Homeric poems. In his explanation for dropsy – believing that the excess fluid comes from air – the author of *Breaths* rules out the dry internal structures: bone, tendons, and sinews (ὀστέα καὶ νεῦρα καὶ ἴνες).¹⁰³ These dry materials in his opinion cannot produce fluid. Thus, in a humoral system of physiology, they are essentially passive structural parts. This is comparable to the account at *Iliad* 11.219 of the basic structure of a corpse: flesh, bones, and sinews (σάρκας τε καὶ ὀστέα ἴνες).¹⁰⁴

The Homeric use of the term, although somewhat vague, seems to suggest some tough material that is distinguished from bones and flesh (as the author of *Places in Humans* suggests, its material is something between the two).¹⁰⁵ Like bone, its role in the body is structural. Hippocratic authors in their explorations of the ἴνες occasionally attempted to give a more complete picture of their locations and functions within the body. Part of this is reflected in the comments in *Breaths* above. But while it seems that the ἴνες are unable to produce fluid, they do have the capacity to absorb some types of it. What fluid this is varies in specific accounts. *Generation* (13), for example, states that the womb appears to be surrounded by ἴνες, which become swollen with *ichōr* (ἰχώρ), a quality-lacking viscous fluid; *Fleshes* (8) on the other hand

103 The difference between νεῦρα (*sinews*) and ἴνες (*fasciae*) is described at *Loc. Hom.* 5, where the author locates νεῦρα throughout the body (τὸ μὲν σῶμα πᾶν ἔμπλεον νεύρων). But the author adds: περὶ δὲ τὸ πρόσωπον καὶ τὴν κεφαλὴν οὐκ ἔστι νεῦρα, ἀλλὰ ἴνες παρόμοιαι νεύροις μεταξὺ τοῦ τε ὀστέου καὶ τῆς σαρκὸς λεπτότεραι καὶ στερεώτεραι, κτλ. ('There are no tendons around the face and head, but there are *ines*, which are very similar to tendons, something between bone and flesh, but thinner and denser, etc.'). Cf. Arist. *HA* 515b: Αἱ δ' ἴνες εἰσι μεταξὺ νεύρου καὶ φλεβός. '*Ines* are in between tendons and vessels.' *Ines* or fasciae are comprised of tendon-like material that often form broad strips; unlike tendons, they do not attach either bone to bone or bone to flesh, but instead envelop flesh and other internal structures.

104 The author of *Hp. Sept.* 124 (Grensemann) gives a more robust list of important internal parts: τὰ ἐπιτήδεια ὀστέων τε καὶ ἰνέων καὶ φλεβῶν καὶ νεύρων καὶ σπλάγχχνων καὶ νηδύος καὶ τῶν λοιπῶν. 'the necessary material for bones, fasciae, vessels, tendons, higher organs, lower organs, and the remaining [parts].'

105 Curiously, Σ^{lh} *ad Ar. Pax* 86 defines the ἴνες as vessels (φλέβες). Despite being incorrect in his gloss, both the author's need to define the term and his mistake suggest the word's limited later use.

notes that the ἴνες are themselves viscous or glutinous (κολλώδεις); and *Disease* (2.47, 57) describes bloody ἴνες.¹⁰⁶

Hippocratic authors have seen this capacity of the ἴνες (and sinew in general) to contain fluid as being linked to the proper function of points of articulation. *Fleshes* (10) gives a full outline of how this occurs in a description of the formation of joints (ἄρθρα). The author speculates that when the bones are formed, the heat that they produce burns whatever fat they contain. The glutinous remains that could not be burnt off form sinews (νεῦρα) and fluid.¹⁰⁷ This fluid part thickens with heat but does not solidify, thereby producing synovial (joint) fluid (σίαλον, lit. *spittle*). In other words, heat melts fat in the bones (possibly identified with the marrow, which is partially composed of fat), thereby forming both the tendons that hold the joints together and the fluid that makes them pivot freely.

Aristophanes in his passage from *Peace* appears to be drawing upon a similar understanding of both the kinetics of articulation as well as the material construction of the joints. Although Trygaeus is talking to his winged beetle, the anatomical similarities between wings and human limbs seem to have been recognized by Aristophanes, and certainly at least by Aristotle's time.¹⁰⁸ The same principles, therefore, could be considered to be at work in both types of appendages. His advice to the beetle is not to overexert itself by moving too quickly from the start, but rather warm up ('sweat,' ἰδίης) and relax the ἴνες (*fasciae/sinews*)¹⁰⁹ of the

106 See also Arist. *PA* 650b.

107 For a similar description, see *de Arte* 10.

108 See for examples *Ar. Av.* 1760, Arist. *IA* 706a.

109 Platnauer 1964 *ad loc.* provides the inaccurate gloss 'muscle' for ἴνες; I also disagree with Rau 1967: 92 who interprets the term as a synonym for 'tendons': 'ἴς ist Homerische Ausdruck für νεῦρα (oder τένων).'

ἄρθρα (*joints*).¹¹⁰ As seen in the above explanations by Hippocratic physicians, heat produces the fluid that ‘relaxes’ (διαλύειν) the joints in their sockets. The author of *Breaths* (8) again uses language identical to that of Aristophanes in his description of the loosening of the joints when subjected to fevers.¹¹¹

Aristophanes’ bombastic language works on two levels. Trygaeus, mimicking the Bellerophon in Euripides’ play, uses suitable epic language for a hero. Moreover, Trygaeus’ language also neatly reflects current theoretical anatomical and physiological explanations for how articulation and physical exertion work. As I have argued in the previous chapter, Euripides did not shrink from appropriating language from the contemporary intellectual fabric. Since we only have a few fragments of his *Bellerophon*, we do not know whether or not Aristophanes is directly parodying Bellerophon’s language when he first appears on Pegasus. The words of Trygaeus, however, reflect the type of cutting-edge vocabulary and concepts that Euripides employed.

ψύαι: loin muscles, Euphron fr. 7 K.-A.¹¹²

The term ψύαι (*loin muscles*, or the upper and lower psoas in modern medical language) illustrates the intersection between sacrificial and medical languages (*Fig. 6.1*). The only

110 It is quite likely that ‘warming-up’ might have been a common notion in both gymnastic and equestrian circles, among others. Σ^{RV} ad 85, for example, provides the explanatory note about race horses: οἱ γὰρ ἵπποι ἐν μὲν τῇ ἀρχῇ οὐκ εἰσιν ὀξεῖς ἐν τῷ δρόμῳ, καμόντες δὲ καὶ ἰδρώσαντες διαλυθέντων τῶν μελῶν ὀξύτεροι γίνονται. ‘For horses are not keen at the beginning of a race, but after working and sweating – which relax their limbs – they become keener.’ But in these cases, presumably one would be more inclined to be methodical about the process, ‘warming up’ in order to avoid cramping, over-exerted muscles, and other repercussions. To explain why warming-up works, to explain causes as well as effects, would more properly belong within the domains of the physician or the natural philosopher.

111 Τὰ τε ἄρθρα διαλύεται πρὸ τῶν πυρετῶν. Similarly, heat was considered necessary for the correction of dislocated joints, e.g. *Art. 67. Cyranides*, a late (possibly 1-2 cent. CE) magico-medical text, suggests spreading wolf fat on the tendons (νεῦρα) and joints (ἄρθρα) to ease and loosen (διαλύει) them; it is also useful for treating tetanus (2.23): τὸ δὲ στέαρ αὐτοῦ [*sc. λύκου*] καταχρίομενον νεῦρα καὶ ἄρθρα ὠφελεῖ καὶ διαλύει, καὶ ὀπισθοτονικούς ἰᾶται.

112 Preserved at Ath. 10.444b.

reference to it in drama is by the New Comedy poet Euphron (late 4th to first half of the 3rd century BCE) in his work *The Embassy* (Θεωροί, fr. 7 K.-A.):

λοβός τις ἔστι καὶ ψύαι καλούμεναι·
ταύτας ἐπιτεμὼν πρὶν θεωρῆσαι μαθῶν—

There is a certain ‘lobe,’ and so-called psos [lumbar muscles]; learn these things by cutting, before consulting...[the oracle?].

This passage ostensibly is in a sacrificial context: an envoy is being sent to consult something, probably an oracle;¹¹³ however, the language of the fragment seems to reflect 4th century interests in anatomical investigation. Before making the journey, the speaker of these lines advises the envoy to become familiarized with certain internal parts. The lobe (λοβός) of the liver was an important focal point of observation in haruspicy.¹¹⁴ The term ψύα (or the variant ψόα), on the other hand, is only associated with sacrificial language later in the Septuagint.¹¹⁵ The word is used exclusively for human anatomy in classical writings outside of Euphron’s fragment.¹¹⁶

The grammarian Athenaeus (2nd - 3rd cent. CE), who preserves this passage of Euphron in his *Deipnosophistae*, spends an entire section discussing the ψύαι (399a-c). After citing the

113 For this function of θεωροί, see S. *OT* 114 and *OC* 413.

114 See section 5.4.1 above.

115 E.g. *Leviticus* 3.9-10: καὶ προσοίσει ἀπὸ τῆς θυσίας τοῦ σωτηρίου κάρπωμα τῷ θεῷ, τὸ στέαρ καὶ τὴν ὀσφὺν ἄμωμον (σὺν ταῖς ψόαις περιελεῖ αὐτό) καὶ τὸ στέαρ τῆς κοιλίας (10.) καὶ ἀμφοτέρους τοὺς νεφρούς καὶ τὸ στέαρ τὸ ἐπ’ αὐτῶν τὸ ἐπὶ τῶν μηρίων καὶ τὸν λοβὸν τὸν ἐπὶ τοῦ ἥπατος (σὺν τοῖς νεφροῖς περιελῶν). (‘And he shall offer from the sacrifice of deliverance to God: the fat and the unblemished loins (he shall remove it along with the loin muscles) and the fat of the entrails and both of the kidneys and the fat that is on the thighs and the lobe that is attached to the liver (removed along with the kidneys)’). See also *Kings* 2 2.23, 3.27, and 20.10.

116 E.g. Arist. *HA* 512b21 (quoting Hp. *Nat. Hom.* 11) and Melamp. 505.1. I cite other examples below.

Phrynichus, the 2nd century CE Atticist, believes that neither ψύα nor ψόα was good Attic Greek, but instead claims that the common vernacular name was νεφρόν (*kidney*): Ψύα καὶ ψόα οἱ ἀπλῶς ἁμαρτάνοντες, οἱ δὲ διπλῶς ψοιά· οὐ δὲ νεφρόν λέγει. ‘Those [saying] *psya* or *psoa* are simply wrong, but those that say *psolia* are doubly-incorrect. Say *nephron*.’ Although the kidneys are located in that general anatomical area of the loin muscles, no other reference to the term appears to support that it in any way refers to the kidneys. See Aret. *CD* 2.3.3: τὰς ψύας, ἐνθα τῶν νεφρῶν ἡ χώρα. ‘...the *psyai*, in the region of the kidneys.’

work *The Return of the Atreidae* (ἡ τῶν Ἀτρειδῶν κάθοδος) in which the word also appears,¹¹⁷

he quotes the otherwise unknown Simaristus who defines it in his *Synonyms* (Συνώνυμα):

ὄσφύος αἱ ἐκ πλαγίων σάρκες ἐπανεστηκυῖαι ψύαι. τὰ δ' ἐκατέρωθεν κοιλώματα λέγουσι κύβους γλήνας.

The psaos are the flesh [i.e. muscles] of the loins that rise from the flanks. They call the hollows on either side 'cups' or 'sockets.'

Athenaeus continues by quoting a passage by the peripatetic Clearchus, a student of Aristotle

active in the second half of the fourth century BCE. It is extracted from the second book of his

work *On Dried Bodies* [or *Mummies*], apparently a study of corpses:¹¹⁸

σάρκες μυωτὰ καθ' ἐκάτερον μέρος, ἃς οἱ μὲν ψύας, οἱ δὲ ἀλώπεκας, οἱ δὲ νευρομήτρας καλοῦσι.

There is muscle-like flesh on either side [of the body/spinal axis], which some call psaos, but others *alopeces* [lit. *foxes*]¹¹⁹ or *neuromētrai* [lit. *sinew-matrices/womb*].¹²⁰

117 Ἴσον δ' Ἑρμιονεὺς ποσὶ καρπαλίμοισι μετασπῶν / ψύας ἔγχρῃ νύξε. 'Hermioneus, pursuing Isus with swift feet, stabbed him in the loin muscles with his spear.' The poem is more commonly called the *Nostoi*, part of the Epic Cycle and dating not too long before 500 BCE, according to the New Pauly (s.v. *Nostoi*).

118 See Nutton 2004: 129-30 for a short discussion of how the Egyptian process of mummification (at least in the Alexandrian period) might have encouraged Greek physicians or scientists to challenge the taboo against anatomical investigation of cadavers. He argues that there is little evidence from Egyptian medical writings that they themselves used any findings from the embalming process, either to challenge preexisting beliefs about the body or to support old ones.

119 Ἀλώπηξ does not appear in the HC as an anatomical term, although it is used once at *Aff.* 35 as a variant of ἀλοπεκία, or alopecia, the condition of a loss of hair from the head or body (cf. Hp. *Salubr.* 2.46 for the use of the term in its primary meaning of *fox*). The application of the term (the -ια termination producing lit. *fox-thing*) to a human condition is likely through its meaning of 'mange,' a parasitic hair loss condition that can affect foxes. For a discussion of the medical appropriation of this term, see Skoda 1988: 58-60.

120 Cf. Pollux 2.185, citing Clearchus: οἱ δὲ ἐνδοθεν κατὰ τὴν ὄσφυν μύες καλοῦνται ψοαὶ καὶ νευρομήτραι καὶ ἀλώπεκες· Κλέαρχος δὲ οὕτως ὀνομάζει τοὺς ἔξωθεν κατὰ τῆς ῥάχεως μύς. 'Those interior muscles that are in the region of the loins are called *psoi*, *neuromētrai*, and *alopeces*. So Clearchus names the exterior muscles in the lower spinal region.' Rufus also cites the passage (*Onom.* 192), stating that Clearchus is incorrect in his labels (φησὶ καλεῖσθαι οὐκ ὀρθῶς). The problem appears to be not a matter of terminology, but rather whether the words properly apply to interior or exterior muscle groups (for this see Rufus *Onom.* 188). In modern medical parlance, the *psoa major* is an interior muscle group, while the *psoa minor* is an exterior one.

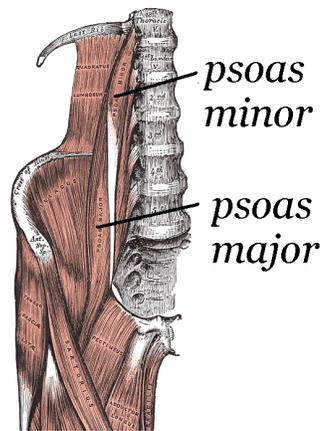


Fig. 6.1: The psoas major and psoas minor muscle groups
(Gray's Anatomy 1918, fig. 430, modified)

So far in Athenaeus' survey, the word has been applied to the human body. As proof of its proper use in this sense, Athenaeus remarks that 'even the most sacred Hippocrates mentions the *psoas*' (μνημονεύει δὲ ψυῶν καὶ ὁ ἱερώτατος Ἱπποκράτης). The word is used seven times in the HC.¹²¹ In most instances an author assumes that his readership will understand the term, since there is no attempt made to explain the word or to mark it as unusual. The technical work *Joints*, however, suggests that it may not have been a familiar word even among medical professionals (45):

Ἐκ τούτου ἄχρι φρενῶν προσαρτήσιος, ἰθυλόρδη· καὶ παραφύσιος ἔχει μυῶν τοῦτο μῶνον τὸ χωρίον ἐκ τῶν εἰσωθεν μερῶν, ἃς δὴ καλέουσι ψόας.

From this point to the start of the diaphragm, [the spine] is frontally convex. This is the only region of the interior where it has attachments of muscles, which they call psoas.

The author's use of καλεῖν to qualify the term (as in Euphron's fragment) is especially telling, since the *Joints* passage contains several other unmarked technical words.¹²² Furthermore, he takes care to explain that these are muscles (μυῶνες) in the lumbar region. If ψόα was expected

121 *Art.* 45, *Mochl.* 1, *Nat. Hom.* 9 and 11, *Oss.* 9 (x2) and 18.

122 E.g. ἀρτηρία (large blood vessel), ἀπόφυσις (a projecting part of a bone), ἐπίφυσις (the end of a long bone), ἐλύτρωται (membranes of the spinal cord).

to be familiar – either to the general public or to the author’s medical audience – there presumably would be no need to identify it in such a way.

The reference from Euphron is the only instance that Athenaeus cites where the human body is not meant, yet later evidence suggests that the term might also have been used in butchery and sacrifice. The close location of the loin muscle group to the spine means that it was part of the cut of meat known as the chine. A scholion on *Iliad* 9.208 (Σ^D) in fact equates the term ῥάχϊς (*lower spine*) of a butchered pig to both the νῶτον (*back*) and ψόαϊ (*loin muscles*). This might suggest once again butchery as the original source, or at the very least a common context, for this term in classical Greek; however, besides the later date of the scholion, the rather imprecise gloss suggest that we should give little weight to the remark to inform us about earlier uses of the term. The spine and the back are in the same region as the loin muscles, but they are clearly not the same parts.

The extensive number of glosses and explanations (correct or otherwise) for ψόα suggests both the rarity of the term and a lack of need among the general population to identify the muscle group specifically. Whether or not Euphron is referring explicitly to animal anatomy in this fragment – and he probably is – he appears to be using language in a way that parodies some specialized vocabulary. The presence of the qualifying τίς (*a certain*) to describe the liver lobe (λοβός) and καλούμεναι (*so-called*) to describe the lumbar muscles (ψύαϊ) both imply that the group whom the speaker is addressing is unfamiliar with his language (and likely some of the audience as well). Indeed, he advises the embassy to learn (μαθεῖν) about these parts personally through cutting (ἐπιτέμνειν) – in other words, through first-hand observation – before setting off.

But we are left to wonder from this fragment why the embassy would need to learn these things before consulting an oracle. One likely possibility is that the speaker is advising the embassy (whomever it might be composed of) how to impersonate sacrificial priests, and that he is here telling them important parts to identify in order to maintain the deception; however, I suggest that there might be a deeper level of imitation intended in these lines. The passage might also reflect – and potentially lampoon – the general aim of the elite class to have a liberal education. A goal of this education was to be able to know enough about everything so as to be a suitable judge of both another’s ability and the difference between truth and fiction.¹²³ It is possible that Euphron is making fun of the sort of anatomical lessons (veterinary and human) taught by Clearchus or his predecessor Aristotle, which would have been available only to a specific elite class. Likely, the average Athenian did not need to know what the lobe of the liver or loin muscles are, let alone what they are called. One having these facts, however, gains some intellectual credibility in showcasing his or her broad knowledge.

φλέβες: vessels, Antiph. fr. 42 K.-A.¹²⁴

A final example from the Middle Comedy poet Antiphanes locates internal anatomical terminology more firmly within the human body.¹²⁵ The fragment from *The Man from Arcadia* (Ἄρκας) presumably is a son advising his father to avoid feeling too superior to someone else.¹²⁶

123 There may be a pun intended with the shared meanings of the term θεωρῆσαι ‘to consult an oracle’ and ‘to look at/inspect.’ The second meaning of the word was sometimes used in the HC to describe observations of a patient, e.g. *Epid.* 2.1.6 on the interpretation of critical signs exhibited by the patient: Θεωρεῖν δὲ οὕτω δεῖ· [μεταβολαῖ] χρωμά-ων, συμπτώσεις φλεβῶν, ὄγκοι ὑποχονδρίων, ἀναρροπία, καταρροπία· ‘It is therefore necessary to observe the following: change of colour, contraction of the vessels, enlargement of the hypochondria, upward and downward movements.’ Aristotle uses it in a similar way in his discussions on animal anatomy, e.g. *PA* 668b: Τὸ δὲ μετ’ ἀκριβείας ὡς ἔχουσιν αἱ φλέβες πρὸς ἀλλήλας, ἕκ τε τῶν ἀνατομῶν δεῖ θεωρεῖν καὶ ἐκ τῆς ζωικῆς ἱστορίας. ‘The [next stage of enquiry] after accuracy is how the vessels compare to one another, which one must observe from dissections and the study of animals.’

124 Preserved at Ath. 10.444B.

125 According to Anon. *De com.* 45.10, Antiphanes’ first play was produced in the second half of the 380s BCE; Mangidis 2003: 19 has proposed a likely range for his life as ca. 408/4 BCE to ca. 334/30 BCE. See Arnott 2010: 286-87 and Mangidis 2003: 17-24 for useful sketches of his life and works.

126 Mangidis 2003: 163 proposes that the title might also be the proper name of the protagonist ‘Arkas.’

This is a rare instance in comedy where medical ideas and vocabulary are not parodied, but instead are used to relate a moral message:

Οὔτε γὰρ νήφοντα δεῖ
οὐδαμοῦ, πάτερ, παροινεῖν, οὔθ' ὅταν πίνειν δέη
νοῦν ἔχειν. ὅστις δὲ μείζον ἢ κατ' ἄνθρωπον φρονεῖ
- ~ - μικρῶ πεποιθῶς ἀθλίῳ νομίσματι,
εἰς ἄφοδον ἐλθῶν ὅμοιον πᾶσιν αὐτὸν ὄψεται,
ἂν σκοπῇ τὰ τῶν ἰατρῶν τοῦ βίου τεκμήρια
τὰς φλέβας θ' ὅποι φέρονται, τὰς ἄνω καὶ τὰς κάτω
τεταμένας, δι' ὧν ὁ θνητὸς πᾶς κυβερνᾶται βίος

In no way, father, does a temperate man need to act like a drunk, nor does he need to keep his wits when it's time to drink. Anyone who thinks [that he's] better and looks down on another, ~ ~ trusting in some small and pitiful wealth, will see when he's at the point of death that he is just like everyone else, if he examines the signs of life that physicians know, and where they trace the vessels – some extending up and some down – through which the whole mortal life is guided.

The only anatomical term appearing in this passage is φλέψ (*vessel*), yet it is an important one.

The vascular system was a special preoccupation of Greek physicians in their anatomical structuring of the body, since, containing blood, vessels were an essential part of humoral theory. But as we have seen, the term was not a recent coinage. Homer mentions it once at *Iliad* 13.546 (although it is uncertain whether or not he is here referring to a blood vessel at all), and it is used frequently since then. In surviving comedy, Aristophanes is the first to use the term in reference to a baby threatened with slaughter upon an altar.¹²⁷ The comic playwright Xenarchus, a contemporary of Antiphanes, uses the term metaphorically in a description of the pulp or octopus (πολύπους, lit. 'many-footed') whose tentacles are comparable to blood vessels.¹²⁸ Neither of these examples from comedy suggest strong medical influences.

127 *Th.* 694: ἀλλ' ἐνθάδ' ἐπὶ τῶν μηρίων / πληγὲν μαχαίρα τῆδε φοινίας φλέβας / καθαιματώσει βωμόν.

128 Fr. 1 K.-A.: φλεβὸς τροπωτήρ, πολύπους, 'a cord of vessel[s], the octopus' (cf. *Od.* 5.432).

The context of this term in Antiphanes, though, illustrates the diffusion of medical ideas within Athens during the 4th century.¹²⁹ Blood vessels – at this time there was no clear distinction made between arteries and veins – were recognized as being fundamental to life, and therefore particularly important to physicians. The author of *Generation* writes (39):

Φλέβες τε γάρ εἰσι διὰ παντὸς τοῦ σώματος τείνουσαι, αἱ μὲν λεπτότεραι, αἱ δὲ παχύτεραι, πολλὰ καὶ πυκναί· αὐταὶ δὲ, μέχρις οὗ ἂν ζῶη ὁ ἄνθρωπος, ἀνεώγασι καὶ δέχονταί τε καὶ ἀφίᾳσι νέον ὑγρόν·

There are vessels that extend throughout the entire body; some are thinner, others are fatter, and many are dense. These [vessels] – without which a human cannot live – dilate, and receive and release fresh fluid.

This perceived importance of blood vessels encouraged the medical community to study them closely. Not only could information about them help physicians to understand the body better, but it could also help them to restore the health of a patient.

Antiphanes' vocabulary seems to echo that used by his contemporary medical writers. Most notably, he uses the verb *τείνειν* (*to stretch/extend*) to describe the course of the vessels through the body. Identical language is used throughout the HC. The author of *Sacred Disease* for example writes (3):¹³⁰

Καὶ φλέβες δ' ἐς αὐτὸν τείνουσιν ἐξ ἅπαντος τοῦ σώματος, πολλὰ καὶ λεπταὶ, δύο δὲ παχεῖαι, ἡ μὲν ἀπὸ τοῦ ἥπατος, ἡ δὲ ἀπὸ τοῦ σπληνός.

And vessels extend (*teinousin*) to [the head] from the whole body; many are thin, but two are thick: one extends from the liver, the other from the spleen.

The vessels in this passage, as in the Antiphanes fragment, are said to 'extend' (*τείνειν*) through the whole body. They are described here because the author considers them important for

129 Antiphanes himself composed a play entitled *The Physician* (Ἰατρός, fr. 106-7 K.-A. = Stob. 4.35.27 and Ath. 4.175A). Fragment 106 provides an interesting comment about disease vocabulary: "Ἄπαν τὸ λυποῦν ἐστὶν ἀνθρώπῳ νόσος / ὀνόματ' ἔχουσα πολλά. ('All the pain that exists for a human is a disease having many names.'). Langholf 1986: 18 has observed the fragment's close similarity to the introduction of Hp. *Flat.*: ὁ γὰρ ἂν λυπέη τὸν ἄνθρωπον, καλεῖται νοῦσος ('Whatever pains a human is called "disease"').

130 For other examples from the HC, see *Int.* 13, *Mul.* 39, *Epid.* 2.4.2 (comparing tendons to vessels); the verb is similarly used to describe the course of vessels in Diogenes fr. 6 DK and in Aristotle, e.g. *HA* 511b, *PA* 678a.

considering why some people suffer from the ‘sacred disease,’ or epilepsy. He later explains in section 4 that the vessels are necessary for taking in and distributing most of the air we need, thereby cooling the body. When this flow is interrupted or corrupted, the result is a variety of different abnormal conditions. Moreover, as discussed above in the context of the term κάτω κοιλία at *Frogs* 485, Antiphanes’ use of directional terms ἄνω (*upward*) and κάτω (*downward*) is further comparable to the directional oppositions used by physicians when describing the extent or regions of body parts and the movement of fluids.

That Antiphanes uses both the verb τείνειν (*to extend*) and the adverbs ἄνω (*upward*) and κάτω (*downward*) may seem tautological without context: if the vessels extend throughout the body, they are nearly certain to run up and down at least at some points of their track. Directionality, however, is important in anatomical descriptions to note the relative course of a part or fluid. For example, the author of *Sacred Disease* (3) tracks the right downward extension of the hepatic vein near the kidney and the psoa muscle to the interior thigh.¹³¹ Indication of both directions, upward and downward, implies a source. The wording Aristotle uses in his *History of Animals* (513a) offers good evidence that Antiphanes was imagining the heart in his description of the vessels:

Αὗται [*sc.* δύο φλέβες] δ’ ἔχουσι τὰς ἀρχὰς ἀπὸ τῆς καρδίας... ἡ δὲ καρδία ὡσπερ μόνιον αὐτῶν ἔστι, καὶ μᾶλλον τῆς ἐμπροσθίας καὶ μείζονος, διὰ τὸ ἄνω μὲν καὶ κάτω τὰς φλέβας εἶναι ταύτας, ἐν μέσῳ δ’ αὐτῶν τὴν καρδίαν.

These [two vessels, i.e. the vena cava and the aorta] originate from the heart... and the heart is just like a part of them, especially the foremost and largest one [i.e. the vena cava], because these vessels [run] upward and downward, whereas the heart is in the middle of them.

131 τὸ μὲν τι τῆς φλεβὸς κάτω τείνει διὰ τῶν ἐπὶ δεξιὰ παρ’ αὐτὸν τὸν νεφρὸν καὶ τὴν ψυχὴν ἐς τὸ ἐντὸς τοῦ μηροῦ.

Aristotle describes here the two major vessels moving upward and downward within the trunk of the body, and how they appear to join in the middle to form the heart. This expansive movement of the vessels from the heart matches very well in both its depiction and vocabulary with Antiphanes' account.

Leaving vocabulary aside, perhaps what is most important about this fragment from Antiphanes is the conceptual underpinnings that it suggests, which has implications about some classical Athenians' understanding of the scope of the medical profession. The character who is providing the advice in this passage, the son, begins by drawing distinctions between two possible extremes: those who do not drink (and who do not act drunk) and those that drink (and who do act drunk); both, in his opinion, are apparently acceptable. His specific advice is that someone who thinks that he is better than another for some reason should – or perhaps inevitably will – amend his ways. For an explanation for why this is so, he appeals to the authority of doctors. Specifically, he points to their interest in anatomy, or what makes up a body. The son is aware that doctors know about the signs of life (τοῦ βίου τεκμήρια) that are manifest in the vessels throughout a human's body. Moreover, he relates that these doctors believe that the vessels are what guides (κυβερνᾶν) a person's life.

All of this could potentially seem trivial and irrelevant to the point at hand: why someone should not feel superior to another. But the proof that the physicians provide is tied up in the final lines: the vessels 'guide the whole of mortal life' (ὁ θνητὸς πᾶς κυβερνᾶται βίος). The meaning here is twofold. An individual's life is ultimately linked to his or her vessels. Death occurs when the vessels' normal activity is disturbed (e.g. when someone bleeds to death). But beyond that, human life as a broad concept is preserved through the blood within the veins. Each individual's existence is not dependent upon a unique anatomical and physiological

organization. When all extraneous differences are removed, every human life operates on the same principles. Antiphanes therefore implies that physicians are providing something very important in addition to treatment of sickness. They also offer a model not of a single body, but of a general body, a theoretical one that has been stripped of all peripheral, incidental, differences. The result is an egalitarian concept of our material form. This is authoritative biological proof (τοῦ βίου τεκμήριον) to support the son's ethical position. Why should one not think himself to be better than another? Because doctors have offered scientific proof that no one is in reality all that special.

6.4. Conclusions

From the above examples, I have intended to show how comic playwrights could exploit unusual anatomical vocabulary as a means to destabilize bodies (both human and animal) as part of their humour. The disordered bodies in fragments of Epicharmus show an early use of this type of joke. The burgeoning technical language in the 5th and 4th centuries provided more fodder for the comic poets to use. Especially in the case of listings of anatomical parts, I have argued that both incongruous and ambiguous terms for bodies produced confused images of characters and animals. I have used the word grotesque as a reflection of this comedic informing of the body. Unlike the grotesque body in tragedy, however, which most often becomes the locus for a character's suffering, the comic stage embraces this disharmony for the audience's amusement.

From the available evidence, it appears that comedy's direct appropriation of medical vocabulary for the body was a slow process that was first mediated through tragedy. The two earliest examples from Aristophanes, σφόδρυλος and κοτυληδών from *Wasps* (422 BCE) and ἴνες from *Peace* (421 BCE), although suggesting medical influences, are specifically marked as

imitations of tragic language. The audience might have only been expected to recognize that such words were things that clever tragedians would include in their plays. We see evidence for a more direct appropriation of medical anatomical language later in his body jokes about the ἥτρον (*Thesmophoriazusae*, 411 BCE) and the κάτω κοιλία (*Frogs*, 405 BCE) where there is no suggestion of tragic influences. The examples from Euphron (ψόα) and from Antiphanes (φλέψ) – New and Middle comic playwrights, respectively – also show closer connections with medical thought. In these examples, there is likely some requirement for the audience to understand technical anatomical language – at the very least what it sounds like – to fully appreciate the joke. Antiphanes’ moralizing account of human anatomy provides the strongest (albeit limited) evidence for a growing public familiarity with medical models of the body in 4th century Athens.¹³² Here medical ideas and vocabulary are treated more seriously: they are more than strange new things that clever people talk about as the character Philocleon suggests in *Wasps*; they are avenues that can help the audience to understand better what they are and their specific place in the world as humans.

132 I strongly suspect that if more 4th century comedy survived, we would find an even greater representation of medical models of the body on the comic stage. We see tantalizing evidence for this increased presence of medicine in comedy in the depiction of the pseudo-doctor in Menander’s *Aspis* (328 f.) and in three New Comedy plays called *The Physician* (ἰατρός), of which only inconclusive fragments survive: Aristopho fr. 4-5 K.-A. = Stob. 3.6.10 and Ath. 6.238B, Theophil. fr. 4 K.-A. = Ath. 8.340D, and Philem. fr. 35-36 K.-A. = Ath. 6.231A and Antiatt.104.13.

Chapter 7

The Body in Classical Athenian Prose

In this chapter I turn to appearances of anatomical vocabulary in the prose writings of Herodotus, Thucydides, Xenophon, and Plato. We find in these works different applications of technical terms than we have seen in the two previous chapters. Unlike most examples from tragedy and comedy where medical words were used to problematize the body, prose authors usually employed them for positive purposes: their intents were to clarify the body, not to distort or to obscure it.

Classical Athenian prose authors generally avoided detailed descriptions of the body. Dover proposes that this was because they were ‘aesthetically distasteful’;¹ however, there are instances when all four authors show awareness of medical anatomical vocabulary (although to varying degrees). In their hands, the medical model of the body becomes a tool that could be used under special circumstance to enhance their subjects:

1) Herodotus (*ca.* 484 – *ca.* 425 BCE) provides several detailed discussions of human anatomy, usually when describing non-Greeks and their treatment of the body. His Ionic dialect means that there is a close overlap between his vocabulary for the body and that used by Hippocratic authors; however, much of it remains general. Even in the fullest description of human anatomy, his account of Egyptian embalming, there is only limited evidence of his engagement with medical terminology.

2) Perhaps surprisingly, of the four prose authors Thucydides (*ca.* 455 – *ca.* 395 BCE) shows the lowest engagement with anatomical language (both general and technical). His most detailed description of the body appears in his account of the plague of Athens (430/29 BCE). Despite Thucydides’ clear familiarity with medical theories of disease here, he does not appear to have used anatomical terms with strong medical connections.

3) Xenophon (*ca.* 430 – *ca.* 355 BCE) makes the greatest use of anatomical vocabulary in his technical treatises *On Horsemanship* and *On Hunting with Dogs*. These two

1 Dover 1997: 115.

examples provide valuable evidence for the intersection of terminology for animal and human bodies through the lens of medical thought.

4) Plato (428 – 347 BCE) shows the greatest engagement with technical medical vocabulary for the body, yet because of his primary interest in ethical philosophy he restricts his use of it to two works: the *Symposium* and *Timaeus*. In the *Symposium*, specifically in the speeches of the physician Eryximachus and the comic poet Aristophanes, Plato draws upon medical models of the body to criticize medicine's ability to attain valuable knowledge outside of its study of disease. His use of medical terminology in this dialogue is used as a subtle way to reinforce this point. The *Timaeus* represents a different approach. In this dialogue Plato engages directly with medical discourse about the body, and appropriates it as a valid means to support the broader argument in his work.

My intent in this chapter is to argue for a changing perception of medical anatomical terminology among 4th century Athenian intellectual elites. Although there is some evidence of medical terms in Herodotus' and Thucydides' 5th century histories, the number of words is small despite opportunities where more medical material conceivably could have been appropriate. Later 4th century treatises by Xenophon and Plato, however, suggest an educated audience who was more familiar and comfortable with medical anatomical vocabulary and who saw the practical value of medical approaches to the body beyond the confines of the profession. The strange foreign medical bodies that had piqued the attention of dramatists in the previous century, although still different, were becoming increasingly more accessible and accepted.

7.1. The historical body: Herodotus and Thucydides

It appears that both Herodotus and Thucydides had some exposure to medical thought. The limited yet growing scholarly interest in the intersection of historiography and medicine has tended to focus on two primary areas: mention of physicians and disease and the shared interests

of cause and effect between historians and medical writers.² Since physicians were part of the communities in the Classical period, they are mentioned by both Herodotus and (less frequently) Thucydides.³ A broader similarity between historiography and medicine is their respective approaches to pursuing questions. Both fields were concerned with recording events (e.g. illnesses/wars) and why things occurred the way they did. Thomas provides a useful comment on the similar methodology of physicians and historiographers:⁴

[T]he careful attention to the evidence of the senses is shared by both [historians and physicians] – the reliance on autopsy, experience, sight, rather than on abstract theorizing contrasts with some of the methods of the natural philosophers.

The aims of a historiographer are closest to those of physicians when he is attempting to establish ethnological principles about the body. In the writings of Herodotus and Thucydides, the human body usually becomes a locus of enquiry when it relates to a society, race, or community. This, after all, is a domain of historians: they use a single body (or a homogenized ‘body’ of a specific class/race) to help inform the reader about moments in history.

The human body in these instances represents a microcosmic example or proof for larger events. This is especially true for Herodotus in his *Histories of the Persian War*. His broad

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- 2 For general studies on Herodotus and medicine, see Althoff 1993, Dawson 1986, and Thompson 1966. On Thucydides and medicine, see Rechenaur 1991 and Weidauer 1954. Jouanna 2005, who examines both Herodotus and Thucydides, is primarily concerned with similar investigations of cause and effect in medical and historical writings (see earlier Lloyd 1966: 341-60). Thomas 2004 ch. 3, Thomas 1998, and Lo Presti 2012: 171-73 provide accounts of ethnographic studies in Herodotus. Lo Presti makes a strong connection between concepts of ethnology in Herodotus and in the Hippocratic work *Airs, Waters, Places*. In particular, he argues that the two writings are similar in the way that they assign environmental factors as causes for a race’s physical and psychological disposition. See further Osborne 2011: 129-30 for the same comparison. Thomas (2004 and 1998) expands her study of Herodotus and medical writings to show convincing parallels between Herodotus’ use of the body as evidence (τεκμήριον) and that which is found in such works as the Hippocratic *Traditional Medicine, The Art, and Nature of Humans*. For a recent discussion that argues for the longstanding Greek interest in ethnography first evident in the Homeric poems, see Skinner 2012. He suggests the possibility that historians and medical writers might have been drawing upon shared cultural presuppositions about the bodies of different races.
- 3 E.g. Herodotus: 1.197 (on Babylonians having no need for physicians), 2.84 (on the specialization of Egyptian medicine), 3.1 (on Cyrus seeking the best eye doctor in Egypt), 3.125-30 *et passim* (on the physician Democedes of Croton); Thucydides: 2.47-49 (on doctors during the plague of Athens), 6.14 (Nicias’ analogy of the *prytany* as a physician of the state).
- 4 Thomas 2004: 22. On appearance (εἶδος) in Thucydides and medical writings, see Weidauer 1954: 21-27; on πρόφασις (‘cause’) in Thucydides and medical writings, see Rechenaur 1991: 38-73.

geographical interests in the project meant that he had many opportunities to discuss foreigners. As we shall see, one approach that Herodotus uses to define the ‘other’ (i.e. non-Greek) is to concentrate either on a race’s perceived anatomical differences or on its different ways of treating the body.⁵ Thucydides, on the other hand, has a much more narrow scope of interests in terms of ethnographic body differences, since his *History of the Peloponnesian War* is principally concerned with a conflict between Greeks.⁶ His attention to the human body therefore does not focus on different races of people, but rather on anomalies that are used to separate an individual (or group, in the context of disease) from the normalized healthy Greek body.

7.1.1. Herodotus

Herodotus’ anatomical vocabulary has close connections to Homeric and Hippocratic vocabularies, but since he was likely writing his *Histories* when Hippocratic writings were just beginning to circulate, there would have been few opportunities for him to have been exposed to these treatises.⁷ Instead, much of his unusual anatomical knowledge and vocabulary appears to have been derived from sacrificial contexts. Although he probably spent time in Athens and was perhaps buried there,⁸ he was originally from Halicarnassus in Asia Minor. His dialect is Ionic, and it therefore generally aligns with the surviving fragments of other Ionic historians and

5 Hartog 1988 remains the fullest account of Herodotus’ creation of the ‘other’ in his *Histories*.

6 The remark by Grant 1983: 285, although focusing on one specific point of comparison, can be held as a cautious generalization: ‘Herodotus is investigating geography, ethnography, and natural history, [while] Thucydides the existence of wars or anything else on a large scale in early Greece.’

7 The question of when his *Histories* was composed is a matter of much scholarly debate, although a broad range of between 450 and 420 BCE has been suggested (Marincola 2001: 24). See Buckley 2010: 10, who notes that the general scholarly consensus is that Herodotus had collected most of the material for his project by the time he settled in Thurii (444/43 BCE).

8 See Hadot 1984: xvii, Marincola 2001: 21-22, and *Suda s.v.* ‘Herodotus’ as a primary source of our information. Asheri 2007 *et al.*: 3 definitively states that Herodotus spent time in Athens. Cf. Podlecki 1977 for the eccentric argument that Herodotus either never went to Athens or visited only for a short time.

philosophers.⁹ For this reason we find in the *Histories* several anatomical terms for external body parts that are rarely seen in Attic prose.¹⁰ Four examples illustrate this:

- 1) κρόταφος (*temple*)¹¹
 3.8: the Arabian practice of cutting the hair around the temples
 4.187: the Libyan practice of burning the veins around the temples to prevent disease
- 2) λαπάρη (*flank*)¹²
 2.86: the process of Egyptian mummification
 6.75: the Spartan Cleomenes' self-mutilation
- 3) νηδύς (*abdomen*)¹³
 e.g. 2.84: the abdomen in the medical specialization of Egyptians
 3.109: the abdomen of an Arabian viper
 4.71: the Scythian process of embalming
- 4) πῆχυς (*forearm*)¹⁴
 e.g. 1.178, 2.92, and 7.36: all in measures of length (*cubit*)

Although these terms sometimes appear in detailed descriptions of the body, they are too general to suggest technical influences.

9 For details of Herodotus' dialect, see White 1880. Asheri 2007 *et al.*: 50 cites Hermogenes of Tarsus' (ca. 200 CE) work *On Style* 2.12 where he calls Herodotus' Ionic, "mixed" (μεμιγμένη, ποικίλη) rather than "pure" like that of Hecataeus'. At n. 122, however, Asheri remarks that Dionysius of Halicarnassus in *Ad Pompeium* 3.3 describes Herodotus' Greek as standard Ionic. He concludes that we have too few examples of 5th century Ionic writings to allow for an adequate analysis of Herodotus' precise dialect.

10 Comparable examples of Ionic anatomical vocabulary are found in the fragments of the 5th century historian and physician Ctesias of Cnidos (ca. 441 – early 4th century BCE), e.g. κρόταφος: fr. 20.34 Jacoby; ἰγνύη: fr. 20.48 Jacoby; ἄσπράγαλος (as *vertebra*): fr. 45.441 Jacoby. These and similar fragments suggest his interests in anatomy (most easily explained by his medical background), yet the limited surviving material makes a full assessment of his anatomical vocabulary difficult. From what remains, there is no evidence for explicit use of medical terminology in Ctesias' historical writings (most prominently his *History of Persia*), and much of his language is equally congruent with that found in the Homeric poems. See Tuplin 2004 for a useful analysis of the intersection of historiography and medicine in Ctesias' writings; see Llewellyn-Jones 2010: 11-18 for an outline of his life and works.

11 See *Il.* 4.502, *Od.* 18.378; Hes. *Sc.* 226; Hp. *Epid.* 2.2.24, *Coac.* 209, *Morb.* 3.3. In Athens, the term only appears in poetic writing before Aristotle: *A. Pr.* 721; *E. Tr.* 115; *Ar. Ra.* 854; *Pl. Com.* fr. 90 K.-A.

12 See *Il.* 3.359, 14.447; Hp. *Epid.* 4.38, *Nat. Mul.* 2.14, *Loc. Hom.* 14. For its appearance in Athenian writings before Aristotle, see Diocles Caryst. fr. 193 Wellm.; *Xen. Cyn.* 5.30.

13 See *Il.* 14.342, *Od.* 13.79; Hes. *Th.* 487, fr. 343 West; Hp. *de Arte* 12, *Aër.* 19, *Carn.* 13. In Athens, the term appears only in poetic writings before Aristotle, e.g. *A. Eum.* 138, *Ch.* 757; *S. OC* 1263; *E. Hipp.* 165, *Ba.* 1306.

14 See *Il.* 11.375, 21.166; Hp. *Fract.* 39, *Art.* 2, *Loc. Hom.* 6, *Epid.* 7.61. In Athens, the term appears only in Xenophon (*Eq.* 12.5) in prose and in Euripides (*Herac.* 728 and *Or.* 1466 [cf. *Rh.* 7]). For πῆχυς as a measure of length in Attic Greek (πηχυαῖος), see *Pl. Phd.* 96e3 and 101b6.

Herodotus rarely describes internal parts. Bones (ὀστέα) of humans are mentioned a handful of times,¹⁵ and joints are named only once (3.129).¹⁶ As previously discussed in chapter 5, his interest in the missing sutures (ῥαφαί) of a skull found after the battle of Plataia may suggest some specific knowledge of medical anatomical terminology (9.83).¹⁷ Terms for human flesh are likewise uncommon; however, Herodotus makes a clear division between human flesh and animal ‘meat.’ He uses the term σάρξ exclusively for humans,¹⁸ while κρέας is reserved specifically for edible animal flesh.¹⁹ Internal organs are very rarely mentioned. Unlike in Hippocratic writings, the generic term σπλάγχνα (*innards*) is usually used for animals (2.40, 4.61, 6.68), but Herodotus uses it once for the human body in his description of Egyptian mummification (2.87).

The only specific organs that Herodotus mentions are the heart (καρδία) and spleen (σπλήν). The heart appears in a description of Cambyses, the king of Persia, who promises to hit his aide Prexaspes’ son in the heart with an arrow to dispel charges of his insanity (3.35). After killing the boy, Cambyses ordered that the body be opened to prove that the heart had indeed been hit, and to his delight it was. This passage is especially notable, since to my knowledge it is the first description of postmortem autopsy performed on a human in Greek literature. Herodotus is also the earliest identifiable author to mention the spleen (σπλήν). The term appears in a description of an Egyptian pig sacrifice to Moon and Dionysus (2.47):

15 See 1.68 (a 7 cubit long skeleton from Tegea, reported to be the bones of Orestes); 2.87 (the Egyptian mummification process); 3.12 (the difference between Persian and Egyptian skull thickness); 3.66 (the Persian king Cambyses’ gangrene).

16 ἀστράγαλος ἐξεχώρησε ἐκ τῶν ἄρθρων (‘the ankle bone slipped out from the joints’), in a description of Darius’ dislocated ankle. For joints (ἄρθρα) of horses, see 3.87 and 4.2.

17 See section 5.4.2 above. Raaflaub 2002: 161 cites this passage as evidence for Herodotus’ interest in contemporary medical enquiries into human anatomy.

18 See 1.119 (the flesh of Harpagus’ dismembered son); 2.87 (the flesh in Egyptian mummification); 6.75 (flesh of Cleomenes’ self-mutilation); 9.83 (the flesh of the corpses at the battle of Plataia). Cf. 3.29 σαρκώδεις (‘flesh-like’), on the corporeality of Egyptian gods.

19 E.g. 1.119, 2.47, 3.99, 4.26.

ἔπεᾶν θύσῃ, τὴν οὐρὴν ἄκρην καὶ τὸν σπλῆνα καὶ τὸν ἐπίπλοον συνθεῖς ὁμοῦ κατ' ὧν ἐκάλυψε πάσῃ τοῦ κτήνεος τῇ πιμελῇ τῇ περὶ τὴν νηδὺν γινομένη καὶ ἔπειτα καταγίξει πυρί.

When [the one performing the ritual] sacrifices [the pig], he collects the end of the tail, the spleen, and the omentum [abdominal membrane] and covers them up in all the soft-fat found around the abdomen of the beast. Then he offers it to the fire.

Although Herodotus' description of Prexapes' son's heart is very general, the account of the Egyptian sacrifice illustrates his interest in providing detailed images to the reader. He is careful to mention each of the important parts involved in the ritual, including the spleen (σπλήν), omentum (ἐπίπλοον), soft fat (πιμελῇ), and abdomen (νηδύς). The short digression does little to help the reader to better understand the practice; however, it does further Herodotus' claim to authority: such details relate to the reader that he has intimate knowledge of this Egyptian ritual. Herodotus himself visited Egypt where he would have had opportunities either to witness this and other practices firsthand or to hear about them from locals.²⁰ His comment at 2.99 stresses that much of his information was gathered from personal observation (ὄψις).²¹

Herodotus' most detailed account of human anatomy, his description of Egyptian mummification, also illustrates his detailed knowledge of Egyptian practices (2.85-88).²² These chapters have received much scholarly attention for being one of the most detailed literary accounts of Egyptian embalming.²³ The description is part of Herodotus' broader interest in the Egyptians' advanced technical knowledge. This is most evident in his discussion of their

20 See Asheri 2007 *et. al.*: 226 and Lloyd 1975c: 68, who date Herodotus' trip to sometime between 449 and 430 BCE.

21 Μέχρι μὲν τούτου ὄψις τε ἐμὴ καὶ γνώμη καὶ ἱστορίη τὰῦτα λέγουσά ἐστι ('Up to this point these accounts have been derived from my own observation, opinion, and enquiry'). See further Asheri 2007 *et al.*: 228-30 and Lloyd 1975c: 82.

22 For descriptions of Egyptian mummification practices and beliefs, see Peck 1998 and the more detailed work of Dudand and Lichtenberg 2006.

23 For examples, see McCoskey 2012: 61, Wallis Budge 2011: 203-5, Dudand and Lichtenberg 2006: 94, and Harrison 2003.

specialized medical fields for specific parts of the body in the previous chapter (2.84).²⁴

Although Herodotus does treat medicine and embalming as different crafts,²⁵ his choice to group his discussions of these two professions together suggests that he considered them to be cohesive narratives about the Egyptians' advanced knowledge of the body.

Herodotus describes three ways that Egyptians embalmed bodies. The first and most expensive method requires the removal of the brain and contents of the torso, after which the internal cavity is filled with palm wine and herbs (2.86). The second, less expensive, method is to fill the abdominal cavity with cypress-oil through the anus to dissolve the internal organs. The liquified contents are then removed (2.87). The simplest method used by the lower classes is simply to clear the intestines with a clyster (2.88). In all three processes, the body is placed in natron (natural soda) to desiccate the body.²⁶

Despite Herodotus' detailed accounts of the processes of Egyptian mummification, his descriptions of individual parts of the body are quite general. This lack of specific details appears to follow Egyptian embalmers' focused attention to the treatment of major organs. Usually, all internal organs would be removed except for the heart and kidneys.²⁷ Herodotus' description of this process at 2.86 is quite simple: εἶλον τὴν κοιλίην πᾶσαν ('they would remove all of [the contents of] the torso').²⁸ Although embalmers inevitably would have seen other various internal structures during the process, there is little evidence that they acquired any

24 Among these are eye specialists (ὀφθαλμῶν ἰητροί), head specialists (οἱ κεφαλῆς), teeth specialists (οἱ ὀδόντων), specialists of the lower abdomen (οἱ τῶν κατὰ νηδύν), and specialists of hidden (probably internal) diseases (οἱ τῶν ἀφανέων νούσων). See Asheri 2007 *et al.*: 297-98 and Lloyd 1976: 350-51 for comments that Herodotus perhaps has made too much of the specialization of Egyptian medicine. Although there are parallel descriptions of medical expertise in Egyptian texts, they are uncommon. Moreover, there is substantial evidence for individual Egyptian physicians having a broad range of medical knowledge that overlapped these restricted areas of enquiry that Herodotus mentions.

25 So von Staden 1989: 150.

26 See Lloyd 1976: 356 for his comments that Herodotus might have been making too sharp of a distinction between the three methods.

27 Asheri 2007 *et al.*: 300, Lloyd 1976: 358.

28 Cf. the description of the mummification of Scythian kings at 4.71, where the contents of the abdomen (νηδύς) are only described as being cleared away (καθαίρεσθαι).

new anatomical knowledge from it.²⁹ It seems that they were principally concerned with carrying out the work at hand, which meant that they had little interest in exploring the construction of the body any further than necessary for their tasks to be completed. This methodical and limited engagement with corpses meant that Herodotus probably had no need to use special vocabulary in his descriptions. Only two unusual terms stand out that suggest possible connections with medical terminology:

μυξωτῆρες: nostrils

The first stage of the embalming process that Herodotus describes is the removal of the brain (ἐγκέφαλος) through the nostrils with a curved iron tool (σκολιὸς σίδηρος).³⁰ The term μυξωτῆρες appears only here in classical Greek.³¹ It is next used by the 1st century BCE physician Crateuas (fr. 8) and thereafter regularly in later medical writings,³² but only occasionally outside of them.³³ The term's appearance in Justin the Martyr's *Apology* (55.4) suggests that he understood the word as technical, since he refers to the 'so-called nostril' (ὁ λεγόμενος μυξωτῆρ). Its technicality is further strengthened by the context of the passage, how the material structure of humans (τὸ δὲ ἀνθρώπειον σχῆμα) differs from other living things. Herodotus' use of the more common term μυκτῆρ elsewhere at 3.87 (of a horse) suggests that he was using a rare and perhaps technical variation in his description of mummification.³⁴

29 Gordon 2004: 4-5, von Staden 1989: 29 and 139-40, Majno 1975: 138, Sigerist 1951: 353.

30 See Leek 1969 for discussion of this process.

31 One manuscript (S) has the more common μυκτῆρων (see n. 33 below), which seems to be an attempted correction by the scribe. Other readings include μυξητῆρων (R), a variant that appears elsewhere only at Gal. *Comp. Med.* 13.56.17 K and at [Gal.] *Def. Med.* 19.401.4 and 418.3 K; and the undefendable μητῆρων (*wombs*) (V).

32 E.g. Dsc. 1.54, 2.178; Sor. *Fasc.* 12, *Gyn.* 2.38; Gal. *Comp. Med.* 12.588 K; Cass. 39.

33 E.g. Diodorus Siculus' same description of Egyptian mummification (9.19); Lucian, *Phal.* 1.11 (of a bull); Opp. C. 1.454 (of a dog).

34 For other appearances of μυκτῆρ, see E. *Alc.* 493; Ar. *V.* 1488, *Ra.* 893; Xen. *Eq.* 1.11, *Smp.* 5.6. The word also appears frequently in the HC, e.g. *Epid.* 4.40, *Art.* 38, *Morb. Sacr.* 3, *Aph.* 5.49.

ἔδρη: anus

In chapter 87, Herodotus describes a less costly and less invasive method of embalming practised by Egyptians. Instead of cutting open the body to remove the organs, cypress-tree oil is inserted into the anus, and the rectum – what Herodotus calls the ὀδός, or *path* – is plugged.³⁵ After a day, the oil dissolves both the organs in the abdomen (νηδύς) and higher organs (σπλάγχνα), at which point the plug is removed and the liquified organs are evacuated through the anus (ἔδρη).³⁶ Although other non-medical classical authors use the euphemism ἔδρη (lit. *seat*) to mean ‘buttocks,’³⁷ I can find no other instance in classical sources where the word has this specific sense outside of the HC and before Aristotle.³⁸ The more common term for the anus in Athenian literature is πρωκτός (although it appears to be a vulgar term limited to Comedy).³⁹ It seems that other authors either avoided using the euphemism or, more unlikely, it had yet to become part of common usage in the 5th century.

Although Herodotus was clearly interested in accurately recording both his own observations and others’ accounts about the treatment of bodies (both human and animal), there are only a few instances where he might have been engaging with medical vocabulary. His descriptions of such activities as the autopsy of Prexaspes’ son and Egyptian embalming presumably would have allowed him plenty of opportunities to use detailed vocabulary if he wished or were able. In both of these instances, though, attention was directed only at specific parts of the body: the boy’s pierced heart and the removal of the viscera *en masse* from corpses.

35 I have been unable to find any parallel example for this use of the word; the rectum in the HC is often called the ἄρχός (e.g. *Aph.* 5.58, *Carn.* 3, *Fist.* 9, *Haem.* 2).

36 See Lloyd 1976: 364-65 and Asheri 2007 *et al.*: 301 for the unlikelihood that cypress oil would be able to dissolve the internal organs to such an extent in this short time. It is more probable that the astringent liquid would have postponed decomposition until the body had become desiccated, thus preserving it.

37 E.g. *Ar. Th.* 133; *Xen Eq.* 1.11 (of horses).

38 E.g. *Haem.* 6: ἔπειτα τὸν ἀλίσκον ἐνθεῖς ἐς τὴν ἔδρην, κτλ. (‘Next, inserting the reed into the anus,’ etc.). For other examples, see *Morb.* 2.14, *Loc. Hom.* 47, *Fist.* 7, *Nat. Mul.* 30, and *Mul.* 227. For the euphemism in Aristotle see *PA* 668b18, a description of blood flowing from the anus.

39 E.g. *Hippon.* fr. 104; *Cratin.* fr. 335 K.-A.; *Ar. Ach.* 119, *Eq.* 364, *Nu.* 1300. See Henderson 1991: 149-50 for discussion of how the term is usually used for men and with strong connotations of sexual intercourse.

We get no sense that curiosity – either Herodotus’ or others’ – drew their attentions to other parts that might have been visible. It is also evident from Herodotus’ vivid accounts of bodily mutilation elsewhere in his work that he was not avoiding potentially gruesome imagery for the sake of propriety.⁴⁰ The two terms most likely associated with medical terminology, ῥάφαι (seams of the skull) and μῦξωτῆρες (*nostrils*), can be interpreted as Herodotus’ attempt to convey accuracy and authority in his reporting.

It may be that Herodotus was not very familiar with medical terminology or that he expected that his audience would not be. The absence of evidence cannot be used as a firm indicator either way; however, the earlier date of his work might provide reasons to suspect that Hippocratic writings had yet to become widely known at the time when Herodotus was composing his *Histories*. What his anatomical language does suggest is that there was a distinguishable difference between some Ionic and Attic terms, although Herodotus’ vocabulary illustrates that the Ionic dialect *per se* did not differ significantly enough to explain the level of detailed terminology seen in the HC.

7.1.2. Thucydides

In contrast to Herodotus’ work, the body is rarely mentioned in Thucydides’ *History of the Peloponnesian War*. In fact, there is a near absence of anatomical vocabulary of any sort.⁴¹ Even basic anatomical words rarely appear. Although Thucydides regularly mentions limbs (i.e. πόδες / χεῖρες), κεφαλή (*head*), for example, is only used twice in its anatomical sense (1.6.3 and 2.49.2). He does not mention skin (χρόα, δέρμα), facial features such as noses (ῥῖνες), lips (χείλεα) nor ears (ὠτα), not even fingers (δάκτυλοι). Flesh (κρέας, never σάρξ) appears only

40 E.g. the Persian Astyages dismembers, cooks, and serves Harpagus his own son (1.119); the Spartan Cleomenes flays himself (6.75); the Persian Masistes’ wife’s mutilated ears, nose, and breasts (9.11).

41 Thucydides apparently composed his work in stages. He mentions in his introduction (1.1.1) that he began writing at the first outbreak of the conflict in 431 BCE (ἀρξάμενος εὐθὺς καθισταμένου), and it is possible that he continued working on it until his death about 35 years later (see further Canfora 2006, esp. 20-21).

once in the sense of animal meat as food (4.16.1), and the throat (σφαγή) is mentioned in the context of the suicides of Corcyrean soldiers (4.48.3). Besides these, no other internal parts are mentioned outside of the plague description at 2.49.⁴² Living and dead bodies are instead generalized (σώματα / νεκροί).⁴³

Thucydides restricts the majority of anatomical terms to his account of the plague of Athens (430/29 BCE).⁴⁴ The disease was especially virulent. Roughly one in three hoplites and horsemen died as a result of the disease, and an unknown number of women, children and metics. Thucydides reports that it was not until fifteen years later that the population recovered.⁴⁵ He also was infected during the outbreak, which encouraged him to give such a detailed description of it in his work (2.48.3):

ἔγὼ δὲ οἶόν τε ἐγίγνετο λέξω, καὶ ἀφ' ὧν ἄν τις σκοπῶν, εἴ ποτε καὶ αὔθις ἐπιπέσοι, μάλιστ' ἂν ἔχοι τι προειδῶς μὴ ἀγνοεῖν, τὰῦτα δηλώσω αὐτός τε νοσήσας καὶ αὐτὸς ἰδὼν ἄλλους πάσχοντας.

I shall explain what it was like, since I myself was sick and saw others suffering from it. And I shall make these things clear, so that if it ever happens again, someone seeing it will have some foreknowledge and will not fail to recognize it.

This desire to provide a record for future identification of the disease provided Thucydides with the impetus to describe it using uncommon, and possibly medical, vocabulary. Thomas has shown that Thucydides reveals mixed feelings about the use of medical language in his account.⁴⁶ Although Thucydides uses several terms for symptoms of the disease that have

42 But cf. Nicias' passing comment about his 'kidney disease' (νόσος νεφρῆτις) at 7.15.1.

43 E.g. σώματα (used only for living bodies): 1.17.1, 2.51.3, 7.74.1 (38 total instances in the treatise); νεκροί: 1.54.1, 2.52.2, 4.38.1 (57 total instances).

44 The bibliography on Thucydides' description of the plague is immense, and it would be impossible to cite even a portion of scholarly discussions here. For a useful cross-section of studies, see Papagrigorakis 2008, Longrigg 1980, and Holladay and Poole 1979 for attempts to classify the disease; Craik 2001c on his physiological description of the plague; Longrigg 2000 on Thucydides' description of Athenian reaction to the plague; Winton 1992 on the villainizing of the plague by Thucydides and its context in his narrative of the Peloponnesian war as a whole. For earlier studies, see Page 1953: 97 n.1.

45 Thucydides (2.58.3) remarks that of the four-thousand hoplites in the expeditionary force to Potidaea, one-thousand and fifty died. Wylie 1983: 11 comments on the difficulty of assessing any further demographic details beyond this number. See Th. 6.26.2 for his comment about the slow recovery of the city's population.

46 Thomas 2006: 97-98.

strong medical parallels,⁴⁷ he also seems somewhat dismissive about medical labels:

ἀποκαθάρσεις χολῆς πάσαι ὅσαι ὑπὸ ἰατρῶν ὠνομασμέναι (‘There were bilious secretions of all sorts that are named by doctors’).⁴⁸ Yet ἀποκαθάρσις (*secretion*) itself appears to be a specifically medical word.⁴⁹ Her conclusion, I think, is correct: as part of the intellectual elite, Thucydides was exposed to medical terms, and was able to draw upon them when the need arose.

Although limited, the vocabulary for the body in section 2.49 is still exceptional within Thucydides’ project. As Hornblower suggests, this illustrates his attempt at ἀκριβεία (*accuracy*) in his account of the plague.⁵⁰ Page has previously identified only 12 anatomical terms in this section: αἰδοῖα (*genitals*), γλῶσσα (*tongue*), τὰ ἐντός (*innards*), κεφαλή (*head*), κοιλία (*belly*), ὀφθαλμοί (*eyes*), πόδες (*feet*), στήθη (*chest*), φάρυγξ (*throat*), and χεῖρες (*hands*).⁵¹ Despite the generality of these words, Craik has convincingly shown how they correspond with medical writers’ tracking of disease within the body.⁵² As in Herodotus’ account of Egyptian embalming, only two terms suggest possible medical influences:

καρδία: heart

Thucydides describes the plague’s movement from the head (κεφαλή) to the chest (στήθη), where it settles in the καρδία. Scholarly interest in Thucydides’ use of this term, which was common in Greek writings, is not focused on its technicality *per se*, but rather its meaning. The problem stems from Thucydides’ comment that the καρδία was disturbed by the illness and

47 θέρμαι ἰσχυράι (*strong fevers*), ἐρυθήματα (*redness of the skin*), ὑπέρυθρον (*reddish*), φλόγωσις (*inflammation*). See Craik 2001c and Page 1953: 104 for discussions of these terms.

48 Hornblower 1991: 322, who argues for Thucydides’ familiarity with medical thought, suggests that what Thucydides meant was, ‘I could have been even more technical if I had chosen to be.’ Parry 1969: 113 proposes that Thucydides truncated his discussion of the types of bile in order to move on to something that interested him more: the devastating effects of the plague.

49 See *Morb.* 4.37 and *Epid.* 5.20 for its use in the HC.

50 Hornblower 1991: 322. He expands upon the meaning of the term earlier (60): ‘i.e. the meaning is objective, rather than the subjective...There is also present the idea of *precise* conformity with reality.’

51 Page 1953: 99. I omit χολή from the list, since it properly belongs within the domain of physiology.

52 Craik 2001c: 105-6.

agitated bile (χολή).⁵³ Page and Craik have both observed that modern translators often follow Galen, who commented that ‘the ancients’ called the orifice of the stomach the καρδία (τὸ τῆς γαστρὸς στόμα καρδίαν ὀνομάζουσιν οἱ παλαιοί, *Plac. Hp. et Pl.* 2.8.8 K). Both, however, rightly conclude that Thucydides was most likely using the term in the more well-attested sense of ‘heart.’⁵⁴ It was not that he was using καρδία in a different sense other than ‘heart’ (i.e. ‘stomach’). Rather, he was following medical beliefs that the heart was in some way a receptacle for various fluids.⁵⁵ Thucydides must have meant ‘heart’ when he wrote καρδία.

ἄκρωτήρια: bodily extremities

Thucydides later describes the plague’s ‘capture of the extremities’ (ἄκρωτηρίων ἀντίληψις), which included the genitals (αἰδοῖα), the ends of the hands (ἄκραι χεῖρες, i.e. ‘fingers’), and the feet (πόδες).⁵⁶ This is an uncommon use of the word, since it is generally used in classical writings for extreme points of geographical features or of other inanimate objects.⁵⁷ Thucydides himself uses it elsewhere exclusively in the sense of ‘promontory.’⁵⁸ As Page notes, ἄκρωτήρια appears several times in the HC in the sense of extremities of the body,⁵⁹ yet he adds that the Attic orator Lysias (ca. 445 – ca. 380 BCE) also uses it in the same way (*Against Andocides* 26, 400/399 BCE).⁶⁰ In Page’s mind, this diminishes the chance of a limited medical source of the term, since the passage from Lysias does not suggest any such connection. If ἄκρωτήρια here

53 ὅποτε ἐς τὴν καρδίαν στηρίξειεν, ἀνέστρεφέ τε αὐτὴν καὶ ἀποκαθάρσεις χολῆς (‘Whenever [the plague] situated itself in the heart, it upset it and there were purgations of bile’).

54 Page 1953: 100, Craik 2001c: 106, so Hornblower 1991: 322.

55 For Hippocratic examples of fluids (χολή, φλέγμα) travelling to the καρδία, see *Aff.* 14 and *Morb.* 2.5. See further p. 113 above.

56 Cf. Xen. *An.* 4.5.12-13 and 7.4.3 where soldiers’ extremities lost by frostbite are not generalized but individually listed.

57 E.g. Hdt. 7.217 (mountain peak); Xen. *HG* 6.2.36 (the beaks of triremes); Pl. *Crit.* 116d3 (the top of a temple).

58 2.93.4 (Salamis); 1.30.1, 1.47.2, and 3.79 (Leucimna); 6.44.3 and 4.25.4 (Rhegium).

59 E.g. *Prorrh.* 2.6; *Morb.* 1.29, 33; *Aph.* 7.1, 26; *Flat.* 8.

60 Lysias here describes the orator Andocides’s fear that he would be dismembered alive (οἰόμενος τὰ ἄκρωτήρια ζῶντος ἀποτμηθήσεσθαι) after being caught in an act of treachery in Citium. For the dating and a summary of this speech, see Todd 2000: 61-64.

is to be considered technical, or even quasi-technical, we must imagine that Thucydides was thinking specifically about its medical uses.

Thucydides' descriptions of the symptoms of the plague suggests that he knew his medical language. It is curious, then, that we do not find specialized anatomical vocabulary in this section as well. A likely answer is found by returning to Thucydides' reason for providing such a detailed account in the first place: to provide a description of the disease in order for others to recognize it in the future. The disease was the object of his investigation, not the bodies that it affected. Similar accounts of plagues are reported in the *Epidemics* where authors were generally more interested in tracing symptoms of the disease than understanding how it affected the body.⁶¹

Moreover, because Thucydides was primarily recording these details to allow for later recognition of this disease was, he concentrated upon its symptoms, and described them in a way that non-professionals would understand. As Galen comments in his treatise *On Difficulty of Breathing* (3.7.854 K):

Θουκυδίδης μὲν γὰρ τὰ συμβάντα τοῖς νοσοῦσιν ὡς ἰδιώτης ἰδιώταις ἔγραψεν, Ἱπποκράτης δὲ τεχνίτης τεχνίταις.

Thucydides wrote descriptions of disease as a layperson for laypeople; Hippocrates wrote as a professional for professionals.

Thucydides was not concerned with providing a physiological explanation for the plague and its effects that would require a more detailed discussion of human anatomy.⁶² This avoidance

61 For example, in one case recorded at *Epid.* 1.2, the author notes several symptoms of the plague, e.g. φρικώδεις πυρετοί (*fever with shivering*), ἰδρώτες (*sweats*), ψύξις (*chills*), οὔρα ἢ λεπτά καὶ ἄχρω καὶ ἀπεπτα ('urine, either thin, colourless, or crude'), ἔρευθος μετὰ φλεγμονῆς ('red [throat] with inflammation'), ρεύματα σμικρά, λεπτά, δριμέα ('mild fluxes, thin, acrid'), παράληροι (*delirious*). In comparison, only two (common) anatomical words appear in this passage: κοιλία (*bowels*) and φάρυγξ (*throat*).

62 A point he suggests himself at 2.48: λεγέτω μὲν οὖν περὶ αὐτοῦ ὡς ἕκαστος γινώσκει καὶ ἰατρός καὶ ἰδιώτης, ἀφ' οὗτου εἰκός ἦν γενέσθαι αὐτό, καὶ τὰς αἰτίας ἄστινας νομίζει τοσαύτης μεταβολῆς ἱκανὰς εἶναι δύναμιν ἐς τὸ μεταστῆσαι σχεῖν. ('Let a physician or layman give an account of [the disease], as each is able: where it likely came from, and what he thinks were the causes of so great a revolution that were sufficient to have the ability for change.')

of anatomical descriptions also conforms with their general absence elsewhere in his work. As both a military general and a survivor of the plague, he would have seen first-hand the physical effects of both war and disease upon human bodies. Vivid descriptions of either in his project would perhaps have been aesthetically displeasing, especially to an audience that would have lived through the same horrors. Those bodies inflicted with the plague were Thucydides' own fellow citizens; they were not the generalized textual bodies, reducible to a disinterested study of human nature (φύσις ἀνθρωπίνη) that we see in most Hippocratic writings.

7.2. The animal body: Xenophon

As Higgins has remarked, Xenophon is something of a 'Protean' figure,⁶³ since his writings run the gamut from philosophical dialogues to histories, to essays, to technical works on horsemanship and dog-hunting.⁶⁴ As part of the intellectual elite, his broad interests appear to have included medicine as well. We have previously seen that Xenophon knew of medical texts circulating in Athens by the 350s BCE (*Mem.* 4.2.10). In general, though, Xenophon does not offer detailed discussions of human anatomy. For example, he only mentions the heart (καρδία) twice, both times in a psychological sense.⁶⁵ The term ἔντερα (*guts*) appears once in a description of a certain Nicarchus' belly wound.⁶⁶ He also refers to the ἐγκέφαλος (*brain*), but in the context of the edible heart of a palm tree shoot.⁶⁷ No other internal organs appear in his writings.

63 Higgins 1977: 2.

64 For a useful overview of Xenophon's life and works, see Macleod 2008: 7-12. For Xenophon's writings as 'an instrument of *paideia*' in 4th century Athens, see Pownall 2007, esp. 236.

65 *Smp.* 4.28 (Socrates stung in his heart after touching shoulders with the young man Critobulus) and *An.* 2.5.23 (a crown upon the heart [ἐπὶ τῆ καρδία], a metaphor of the Persian statesman Tissaphernes' desire to be king).

66 *An.* 2.5.33: τετρωμένος εἰς τὴν γαστέρα καὶ τὰ ἔντερα ἐν ταῖς χερσὶν ἔχων ('wounded in his belly and holding his guts in his hand.')

67 *An.* 2.3.16 and Dalby 2003: 113-14 for further description of this food.

Xenophon's familiarity with some medical anatomical knowledge is suggested by his description of an injury that the Spartan king (and Xenophon's patron) Agesilaus II suffered while in Megara (376 BCE, *HG* 5.4.58).⁶⁸ Agesilaus, as Xenophon relates, was climbing to the building of the chief magistrate when he ruptured a vessel (φλέψ), although we are not told which one. After blood began to pool in his leg and the pain became unbearable, a Syracusan physician cut a vessel next to his ankle (σφυρόν) to relieve the pressure. The incision refused to heal, and this left him incapacitated for several months. This description is consistent with those in the *HC*. Medical authors were particularly interested in this ankle vessel (the greater saphenous vein), since it was considered an important site for bloodletting. *Internal Affections* traces the vessel to its origin in the head, and suggests that a wound to the ankle could result in pain elsewhere in the body (18). *Nature of Humans* describes a similar path for the vessel (11). The author here suggests that pain can be alleviated by cutting the vein along its track at the lumbar muscles (ψοαί), the testicles (ὄρχιες), the ham of the leg (ἰγνύς), or at the ankle (σφυρόν). Similar accounts are found in specific case histories in the *Epidemics*.⁶⁹

Xenophon's use of technical anatomical vocabulary is more pronounced elsewhere in his treatise *On Horsemanship* (Περὶ Ἴππικῆ) and, to a lesser extent, in *On Hunting with Dogs* (Κυνηγετικός). These works are especially good examples of the intersection between veterinary and human medical terminology for the body.⁷⁰ The term 'veterinary,' however, should be used with caution, since there is no evidence for a specific veterinary profession – the

68 The later parts of the *Hellenica* (including this passage) were probably composed sometime after 362 BCE (Dillery 1995: 12-15).

69 *Epid.* 2.4.5, 5.7, and 7.38.

70 The dating of these works is problematic, although they both appear to have been written during the final two decades of Xenophon's life, the 360s or the 350s BCE (Cartledge 1997: xxxi). The authenticity of *Cyn.* has been questioned (most strongly by Radermacher 1896), yet it is now generally accepted to be genuine (Phillips and Wilcock 1999: 23, Gray 1985, and Delebecque 1970: 13).

medical treatment of animals – until the Hellenistic period.⁷¹ In classical Athens, it appears that such matters as the health of a horse, for example, would fall under the general craft of ‘horsemanship’ (ἵππικὴ) rather than ‘horse medicine’ (ἵππιατρικὴ).⁷² Xenophon’s work suggests what this ἵππικὴ entails, since he is not principally interested in treating sick animals, but rather in their selection and training.

An interest in the health of an animal, however, so far as we can tell from the meagre evidence from the period, appears to have encouraged an overlap with contemporary medical ideas.⁷³ Horses were expensive, so it was financially beneficial to use contemporary medical knowledge for humans to treat them as well.⁷⁴ Xenophon suggests this connection in his description of sickness caused by a horse’s overindulgence in barley (κριθίασις, *Eq.* 4.2):⁷⁵

ἔστι δὲ ὡσπερ ἀνθρώπῳ, οὕτω καὶ ἵππῳ ἀρχόμενα πάντα εὐιατότερα ἢ ἐπειδὴν ἐνσκιρωθῆν τε καὶ ἐξάμαρτηθῆν τὰ νοσήματα.

Just as with a human, so with a horse, diseases are more treatable when they are beginning than when they become more difficult and mistreated.

The passage can be further located in the context of Hippocratic theories of disease by the appearance of the term ὑπεραιμείν (‘to suffer from excess blood’) to explain the internal cause of this barley sickness. This corresponds to the prevalent Hippocratic theory that an imbalance of fluids in the body causes sickness.⁷⁶

71 The earliest record we have of a veterinary surgeon is *IG* 9.2.69 from Lamia, Thessaly (*ca.* 130 BCE) that names a certain Metrodoros as performing this service (Fisher 1988: 191).

72 See for example *Pl. R.* 342c, a discussion of the definition of a τέχνη, where Plato juxtaposes the medical craft (ἰατρικὴ) with ‘horsemanship’ (ἵππικὴ).

73 See for example Adams 1995: 36-41 on the parallels between Hippocratic physiology and that seen in later Hellenistic and Roman veterinary writings.

74 For comments about the expense of keeping horses, see Strepsiades’ monologue at the beginning of *Ar. Nub.*, *Th.* 6.12.2, and *Arist. Pol.* 1321a.

75 See Anderson 1960: 1-2 for a description of the condition in the context of this passage.

76 E.g. *Loc. Hom.* 33 where the author claims that an excess of blood causes pain (ὀδύνη), whereas phlegm causes heaviness (βάρος).

Xenophon's study of horse anatomy further illustrates how medical vocabulary could be used to supplement technical equestrian terms.⁷⁷ He begins the treatise with a description of the ideal qualities of a foal, which he explains must start with a study of its body (since it has yet to be broken, and therefore, we can assume, cannot be tested).⁷⁸ He also tells the reader here that he was relying in part upon the earlier work of Simon, the author of the 5th or possibly early 4th century treatise *On the Appearance and Selection of Horses* (Περὶ Ἐίδους καὶ Ἐπιλογῆς Ἱππῶν).⁷⁹ The lengthy surviving fragment of Simon's work (552 words, according to the *TLG*) suggests how Xenophon was drawing upon preexisting technical writings for his animal anatomical vocabulary (which had close similarities to Hippocratic language).

Xenophon's vocabulary for horses includes a mixture of specifically equestrian terms and technical terms that could be used for both humans and animals. For example, he describes a horse's προκόμιον (*forelock*, 5.6),⁸⁰ the κυνήποδες (*fetlocks*, 1.4),⁸¹ and the χελιδὼν κάλουμένη (the 'so-called *frog*,' 1.3).⁸² All three words are extremely rare in surviving classical writings with these meanings, and appear to be part of equestrian technical vocabulary.⁸³ Other

77 See Widdra 1964: 5 for a useful diagram of anatomical terms that Xenophon employs in this section.

78 τοῦ μὲν τοίνυν ἔτι ἀδαμάστου πῶλου δηλον ὅτι τὸ σῶμα δεῖ δοκιμάζειν.

79 See Althoff 2005: 247-48 for the uncertain dating of Simon's work and for his influence upon Xenophon. He is perhaps the same Simon mentioned at Ar. *Eq.* 242, produced in 424 BCE (so Σ *ad loc.*). If so, it is likely that the treatise was composed sometime during the second half of the century. Doyen-Higuet 2012: 213 suggests a broader date range between the late 5th and the early 4th century. Simon apparently took great pride in his knowledge of horse anatomy. If we are to believe Pollux (2.69), he attacked the painter Mikon for his incorrect depiction of horses with eyelashes on their lower lids.

80 The lock of hair above a horse's forehead.

81 The padded area on the back of a horse's leg immediately above the hoof. The term (lit. 'dog foot') seems to have been appropriated from canine anatomy. See Poll. 5.65, who cites κυνήποδες in a list of 'dog' (κύων) words used outside of their normal sense: κυνήποδες Ἱππῶν.

82 The triangular prominence on the sole of a horse's hoof, lit. 'swallow' (since it is shaped like the bird's tail, LSJ s.v.).

83 προκόμιον appears once elsewhere at Arist. *HA* 630a35; κυνήποδες and χελιδὼν appear only here. For further examples of Xenophon's technical language for horses, see Dover 1997: 112-14. See also Doyen-Higuet 2012 for discussion of equine anatomical terms used by Xenophon and later Greek authors. One of her main observations is that Greek anatomical vocabulary specific to horses is low, except for names designating parts of the foot.

names, specifically those for prominent bones and their parts, also appear in Hippocratic writings (and mostly limited to them) in the context of the human body:

- 1) συγκαμπή (*joint*, *Eq.* 1.8 [here of a horse's jaw]). The term ξυγκαμπή is used in a different sense at *Hp. Nat. Hom.* 11 for the elbow joint.⁸⁴
- 2) ὠμοπλάτη (*shoulder blade*, *Eq.* 1.7; also *Cyn.* 1.7, 4.1, 5.10, and 30; also *Simon Eq.* 6). The word is used frequently in the same sense in the HC.⁸⁵
- 3) ἄκρωμία (*withers*, the ridge between a horse's shoulder blades, *Eq.* 1.11, 6.7, 7.1; also *Simon Eq.* 4, 6, 8). In the HC, the term is used for the points of the shoulder (or the 'acromion process' in modern medical language).⁸⁶
- 4) περόνη (tendon(s) below a horse's knee, *Eq.* 1.5; also *Simon Eq.* 5). The term is apparently used in a similar (although anatomically uncertain) sense at *Hp. Loc. Hom.* 6.⁸⁷

These terms illustrate the possible intersection between vocabulary for human and equine anatomy. Although it is difficult to know the directionality of this influence, the limited use of these words in surviving writings suggests their shared technical status. It is likely, I think, that such terms were developed as part of a larger program of 5th and 4th century intellectual enquiry into the nature (φύσις) of living things in general. In such an environment, cross-pollination of vocabulary is inevitable. As we have seen, medical authors used comparative anatomy as part of their studies into the construction of the human body. Similarly, authors of treatises on animal anatomy could appropriate words used by physicians. It should be noted, though, that neither

84 The *Nat. Hom.* passage is paraphrased at *Hp. Oss.* 9 and quoted directly at *Arist. HA* 513a. The verbal form (ξυγκαμπεῖν, 'to bend') appears often in the HC in descriptions of joints, e.g. *Art.* 19, *Loc. Hom.* 6, *Epid.* 7.23. See also *Arist. HA* 502b11, 575a14, and *Diocl.* fr. 182. But see *Xen. An.* 5.8.10 and *Pl. Phd.* 60b2 for the verb in non-technical contexts, which may suggest a more general use of the term.

85 E.g. *Morb.* 2.58, *Art.* 16, *Epid.* 2.3.4, *Int.* 18. *Arist. HA* 516a32 marks the term as unusual: αἱ καλούμεναι ὠμοπλάται ('the so-called *shoulder blades*'), but cf. *HA* 493b12 for his use of the term without such qualification.

86 E.g. *Art.* 43, *Mochl.* 1, *Coac.* 33. The term next appears in *Arist.*, e.g. *HA* 498b32 (of horses).

87 Here the author describes πέρόναι δύο (lit. 'two pins') that run along the calf (παρὰ... τὴν κνήμην) and extend from just below the knee to the heel. Craik 1998a: 127 notes that these 'pins' are anatomically unclear, although she proposes that the author might have meant the tibia and the fibula bones. If this is so, then they may correspond to the horse's κνήμη (*shank*, i.e. the metacarpal bone) and the περονή (*tendon*, although there are actually two closely grouped ones here that are not distinguishable from external observation: the superficial flexor and the deep flexor). Another possibility is that the author of *Loc. Hom.* was using observations of an animal (e.g. a pig, horse, or dog) for his information. This would account for the two 'pins' (i.e. the superficial and deep flexor tendons) that humans do not have (see König and Liebich 2007: 207-13 and McFadyean 1922: 33-35 for descriptions of these structures in domestic animals).

Simon nor Xenophon appear to be very interested in the internal parts and structures of animals. Attention to these appears to be limited to treatises on human medicine in the Classical period.

Xenophon's and Simon's shared debt to medical anatomical vocabulary is clearest in their use of the suffix -ωδης (designating quality or similarity), which was especially common in Greek medical language, although not limited to it.⁸⁸ In section 5 of his fragment, Simon describes the proper appearance of a foal's leg:

ἔχέτω τὰ περὶ τὴν περόνην καὶ τὴν κνήμην καὶ νευρώδη καὶ ἄσαρκα ὡς μάλιστα ἄχρι τοῦ γόνατος, τὰ δὲ ἄνωθεν τούτου καὶ σαρκωδέστερα καὶ ἰσχυρότερα.

The parts around the tendon [behind the knee] and the shank [of the foal] should be sinewy and as fleshless as possible right up to the knee, but the parts above this should be both fleshier and harder.

At *On Horsemanship* 1.5, Xenophon mirrors his predecessor to some extent, but includes medical elaboration on why the appearance is best. He states that the shanks (κνήμια) of a horse should have thick bones (ὄστᾶ παχέα). This thickness should not be caused by vessels or flesh (οὐ μέντοι φλεψὶ γε οὐδὲ σαρξὶ παχέα), since this could cause a buildup of blood and, as a result, varicose veins (κρισσοί).⁸⁹ Xenophon's rendering of Simon's σαρκώδης (*fleshy*) as σαρξὶ παχέα (*dense with flesh*) illustrates that the same idea could be expressed in a different (and it seems, less technical sounding) way.⁹⁰ But Xenophon does not shy away from such language elsewhere. The adjective appears three times in his anatomical descriptions in *On Hunting with Dogs*.⁹¹ He also uses the suffix -ωδης elsewhere to describe the bony skull of a

88 Schironi 2010: 341, e.g. θανατώδης (*deadly*, *Coac.* 88), ἰδρώδης (*sweaty*, *Int.* 12), χολώδης (*bilious*, *Morb.* 2.5), σπληνώδης (*splenetic*, *Morb.* 2.55), κωματώδης (*lethargic*, *Epid.* 1.3.13), ὑμενώδεα (*fibrous*, *Mul.* 9). Palmer 1980: 256 notes that the 'suffix was productive in Attic-Ionic and in the earlier Koine, but by Byzantine times it was already sterile.'

89 For parallel descriptions of varicose veins in the HC, see *Art.* 41 and *Morb.* 1.14. *Ulc.* 25 suggests blood-letting to relieve the discomfort.

90 Cf. the adjective σάρκινος (*fleshy*), e.g. *Eup.* fr. 417 K.-A., *Ar.* fr. 728 K.-A., *Pl. Lg.* 906c4.

91 4.1 ὄσφῦς σαρκώδεις ('fleshy loins'), σαρκώδη [*sc.* ἰσχία] ('fleshy haunch') and 5.30 κωλῆ σαρκώδη ('fleshy thigh').

horse (κεφαλή ὀστώδης, *Eq.* 1.8 and 5.6); and the sinewy areas below the brows of a dog (ἰνώδη τὰ κάτωθεν τῶν μετώπων, *Cyn.* 4.1). Of course, such use of this suffix would not have required the reader to have any specialized medical knowledge, since he is describing familiar material (flesh, bones, and sinew). With other options available, though, it seems that both Xenophon and Simon were using these adjectives because of their technical connotations.

These adjectives are generally restricted to the HC in classical writings.⁹² For example, in a study of diseases found in different regions the author of *Airs, Waters, Places* notes the appearances of the Scythian people (24):

τὰ εἶδεα αὐτέων παχέα ἐστὶ καὶ σαρκώδεα, καὶ ἀναρθρα καὶ ὑγρὰ καὶ ἄτονα·

They appear stout, fleshy, without visible joints, moist, and slack.

The author of *Articulations* makes a more general claim about the nature (φύσις) of the human thigh (77):

οἱ τε αἱ μηροὶ φύσει γαυσοὶ πεφύκασιν, ἄνωθεν γὰρ σαρκώδεες τε καὶ ξύμμηροι, ἐς δὲ τὸ κάτω ὑπόξηροι.

The thighs are naturally curved, since they are fleshy and close to one another at the top, but slender below.

The adjective ὀστώδης appears only as a substantive in the HC to describe the effects of dropsy (ὀστώδεα τοῦ σώματος, ‘boniness of the body,’ *Morb.* 4.52) and the texture of a skin-growth (μύκη, *Int.* 18, 51); ἰνώδης is used to describe the quality of vessels near the kidneys and around the groin (*Oss.* 14), as well as to describe the texture of the spleen (*Carn.* 9). Both words, however, are not used elsewhere before Aristotle’s work on animal anatomy.⁹³

92 The appearance of σαρκώδης at *Hdt.* 3.29 in a description of the material existence of gods might suggest either an Ionic source for the adjective or a specifically medical borrowing: θεοὶ ἔναιμοι καὶ σαρκώδεες (‘gods of flesh and blood’).

The rare appearances of these adjectives suggest that Xenophon and Simon were drawing upon technical vocabulary for bodies that, because of the similar materials that compose humans and animals, could extend to both species. But what has made Xenophon restrict such language to animals alone? Certainly, subject matter has something to do with it. We see passing glimpses of his interest in the composition of the human body elsewhere in his writings,⁹⁴ however, such detailed language as we see in his studies of horses and dogs would have been out of place, since nowhere else in his writings do bodies become scrutinized to such a high degree. As Xenophon notes in the introduction to *On Hunting with Dogs*, he intended this work as part of a broader program of education (παίδεια);⁹⁵ he likewise begins his work on horses describing himself as experienced (ἐμπειρος) in the subject. Xenophon therefore positions himself as skilled educator on the subjects he is about to discuss, and follows through by using technical vocabulary that bolsters his claim to authority.

7.3. The philosophical body: Plato

Plato undoubtedly had a persistent interest in medicine, which encouraged a greater use of technical anatomical vocabulary than is found in Herodotus, Thucydides, and Xenophon.⁹⁶ He mentioned the medical craft often. Using a *TLG* search for key terms in Plato's writings, Bader remarks that the philosopher refers either to medicine or to physicians 377 times, far more than he mentions rhetoric (290 times) or politics (219 times);⁹⁷ however, it is clear that Plato had a complex relationship with medicine that extends beyond this. He particularly admired the

93 E.g. ὀστώδης: *HA* 499a31 (the legs of quadrupeds: ὀστώδη τὰ σκέλη ἔχει καὶ νευρώδη καὶ ἄσαρκα, 'they have bony, sinewy, and fleshless legs'); *PA* 659b22 (for the head of a bird). ἰνώδης: *PA* 654b28 (the sinewy flesh around the bone), *HA* 508a32 (the sinewy channels of the lungs, i.e. the bronchial tubes).

94 See for example *Mem.* 1.4.5 where he has Socrates argue that the practical organization of parts of the human face, such as the nose and eyes, is due to divine providence.

95 See Jaeger 1944: 179-81 for a discussion of Xenophon's understanding of the educational purpose for this work.

96 Cf. Steckerl 1945: 179-80: 'Plato surely knew the main teachings of Hippocrates by heart.'

97 Bader 2010: 1.

medical profession for its intellectual rigour,⁹⁸ and used its approach to treating disease as an analogy for treating the soul.⁹⁹ Yet he was also wary of medicine's encroachment upon ethical philosophy. Plato's reactions to medical anatomical models in the *Symposium* and the *Timaeus* in particular suggest that 4th century Athenian educated elites were becoming increasingly comfortable with medical discussion. As a result, they were also more willing to use medicine's discoveries about the body to explore other areas of enquiry.

Plato's particular interests in ethical philosophy meant that his writings focus more upon what to do (τί δρᾶν) than upon what a (material) thing is (τί ἔστι).¹⁰⁰ Thus, although he respected the medical art and made use of it as an analogy to explain his own beliefs, he rarely explored questions about what the body itself was. A passage from *Phaedo* provides an excellent example of this contrast.¹⁰¹ Here Socrates, awaiting his execution, describes his young

98 For Plato's admiration of the medical profession as an ideal τέχνη, see Jaeger 1944: 3: 'Plato thinks of the doctor as the representative of a highly specialized and refined department of knowledge; and also as the embodiment of a professional code which is rigorous enough to be a perfect model of the proper relation between knowledge and its purpose in practical conduct.' See further Moes 2001, Moravcsik 2000, Temkin 1963, and Jones 1946: 16-23. Cf. Lloyd 2003: 149 for Plato's possibly strange choice of medicine as a model: 'Plato uses the model of the doctor to construct his image of the expert in moral and political matters. Yet the real-life doctors of Plato's day were – to judge from the evidence in the Hippocratic Corpus – far from being all confident authorities that Plato's ideal would have us believe. Quite the reverse in certain cases.'

99 For an excellent analysis of Plato's soul and its analogy with medical treatment, see Holmes 2010b. See further Ruttenberg 1986 and Lidz 1995 (for Plato's apt use of the medical analogy in his moral philosophy); Stalley 1981 (for his use of disease as an analogy for crime in *R.*); and Stalley 1996 (for a similar discussion of physical pain and punishment in *Ti.*). Plato's view of overall health as an ἰσονομία (equilibrium) is concurrent with that of Hippocratic physicians (e.g. *R.* 585a, *Ti.* 64c and Gocer 1999: 26-27 for discussion). For a similar contemporary notion of health see Philolaus *test.* 27. For the negative impact of this approach upon the progress of medicine in the Hellenistic period, see Nussbaum 1994: 20-22.

100 For τὶ δρᾶν as a core question in Greek ethical philosophy, see Moravcsik 2000, esp. 7-8. For τὶ ἔστι as a primary question in Greek medicine, see Brill 2006: 8: 'By observing nature and attempting to delineate its parts, wholes, and functions the doctor is actively engaged in a process of inquiry to determine what something is.' See Hp. *VM* 1-2, *Nat. Hom.* 1 and *de Arte* 8 for explicit descriptions of this approach. But cf. Rosen 1968: 93-94 for some methodological overlap between Platonic definitions and medical thought: 'the techniques of medicine, to the extent that they reveal or make known "what is," are part of, or the same as, the techniques of philosophy.' For the importance of the question both in the later Aristotelian concept of 'being' and in Hippocratic medicine, see Marx 1977: 14-42, esp. 25-28.

101 I avoid here the difficult problem of whether these ideas are Plato's or Socrates', or the so-called 'Socratic question.' For recent discussion see Prior 2009.

self as being initially swept away by the writings of the natural philosopher Anaxagoras;¹⁰²

however, he later became disillusioned by such theories. He was specifically discouraged by

Anaxagoras' marginalization of the mind (νοῦς) in his studies of cause and effect (98b-c).¹⁰³

ἔπειδ᾽ ἰδὼν καὶ ἀναγιγνώσκων ὁρῶ ἄνδρα τῷ μὲν νῷ οὐδὲν χρώμενον οὐδέ
τινας αἰτίας ἐπαιτιώμενον εἰς τὸ διακοσμεῖν τὰ πράγματα, ἀέρας δὲ καὶ
αἰθέρας καὶ ὕδατα αἰτιώμενον καὶ ἄλλα πολλὰ καὶ ἄτοπα. καὶ μοι ἔδοξεν
ὁμοίωτον πεπονθέναι ὡσπερ ἂν εἴ τις λέγων ὅτι Σωκράτης πάντα ὅσα
πράττει νῷ πράττει, κ᾽ πείτα ἐπιχειρήσας λέγειν τὰς αἰτίας ἐκάστων ὧν
πράττω, λέγοι πρῶτον μὲν ὅτι διὰ ταῦτα νῦν ἐνθάδε κάθημαι, ὅτι σύγκειταί μοι
τὸ σῶμα ἐξ ὀστέων καὶ νεύρων, καὶ τὰ μὲν ὀστᾶ ἔστιν στερεὰ καὶ διαφυὰς ἔχει
χωρὶς ἀπ' ἀλλήλων, τὰ δὲ νεῦρα οἷα ἐπιτείνεσθαι καὶ ἀνίσθαι, περιαμπέχοντα
τὰ ὀστᾶ μετὰ τῶν σαρκῶν καὶ δέρματος ὃ συνέχει αὐτά· αἰωρουμένων οὖν τῶν
ὀστέων ἐν ταῖς αὐτῶν συμβολαῖς χαλῶντα καὶ συντείνοντα τὰ νεῦρα κάμπτεσθαι
που ποιεῖ οἷόν τ' εἶναι ἐμὲ νῦν τὰ μέλη, καὶ διὰ ταύτην τὴν αἰτίαν συγκαμφθεὶς
ἐνθάδε κάθημαι·

As I went on with my reading I saw that the man [Anaxagoras] made no use of the mind, and did not assign any real causes for the ordering of things, but mentioned as causes air and ether and water and many other absurdities. And it seemed to me it was very much as if one should say that Socrates does with intelligence whatever he does, and then, in trying to give the causes of the particular thing I do, should say first that I am now sitting here because my body is composed of bones and sinews, and the bones are hard and have joints which divide them and the sinews can be contracted and relaxed and, with the flesh and the skin which contains them all, are laid about the bones; and so, as the bones are hung loose in their ligaments, the sinews, by relaxing and contracting, make me able to bend my limbs now, and that is the cause of my sitting here with my legs bent.

102 Although the exact dates are uncertain, Anaxagoras (originally from Clazomenae) arrived in Athens sometime near the middle of the 5th century and remained there for about 20 years (Mansfield 1979). See Jouanna 1999: 264 for Anaxagoras' interest in the human body, which seems to have been limited to common materials: "[T]he homeomerous substances (e.g. flesh, bone and so on)," Anaxagoras maintained, "are the elements [= DK 59a]." Although in principle there are an infinite number of homeomerics...or substances formed of like parts, Anaxagoras liked to cite those that constituted the human body.' See further Guthrie 1965: 282-84. Plutarch relates that Anaxagoras, who we are told attracted the attention of many of the intellectual elite in Athens, cut open a ram's head to prove that its single horn was the result of a defect in the brain (*Per.* 6.2 and Holmes 2010a: 84-85 for discussion). Anaxagoras impressed his audience because of his 'natural explanation' for the anomaly (φυσικὸς λόγος, 6.1), but – so far as we can glean from Plutarch's description – his observations were limited to a superficial appraisal of the relative position of the brain (ἐγκέφαλος) within the cranium (κρανίον) of the animal. There is no evidence to suggest that he took care to study the structure of the brain in any detail. See also Onians 1951: 237-38 for further discussion of this passage, where he remarks on connections made between the material of the brain and the material of horns in antiquity.

103 Tr. Fowler 1971 with minor alterations.

In one sense, Socrates is concerned about the use of physiology as a means to acquire a true understanding of causes.¹⁰⁴ He rejected Anaxagoras' investigation into the science of nature (φύσεως ἱστορία, 96a8),¹⁰⁵ because such knowledge of the natural world was insufficient to explain why he chose to do what he did.¹⁰⁶ Socrates is sitting there speaking with Phaedo and not fleeing execution because of his mind. Granted, the parts of his body are 'a "condition *sine qua non*" for that effect,' since they are necessary for his locomotion; however, the particulars of the body's construction remain peripheral to his actions.¹⁰⁷ Anatomical enquiry simply could not provide Socrates (and it appear Plato as well) with the type of truth that he pursued.

7.3.1. Symposium

The *Symposium* provides further evidence of Plato's scepticism about medicine and the medical body when it is used to explore ethical philosophy. The dialogue is particularly interesting to us here because it contains two prolonged speeches where the medical body is brought to the forefront. Notably, the theme of the dialogue is not medicine but rather *Eros* (*love/desire*), which illustrates the encroachment of medical theories into broader areas of enquiry at least by the first quarter of the 4th century.¹⁰⁸

104 For further discussion of Socrates' understanding of 'cause' (αἰτία) in this passage as it relates to human physiology, see Turan 2013: 10-11, Kelsey 2004: 25, Sedley 1998: 114-15, and Davis 1980: 565-66.

105 For this approach in medical writings, see especially Hp. *VM* 20: λέγω δὲ τὴν ἱστορίην ταύτην [*sc.* ἰητρικὴν] εἰδέναι ἄνθρωπος τί ἐστὶ, καὶ δι' οἷας αἰτίας γίνεται...ἐπεὶ τοῖ γέ μοι δοκέει ἀναγκαῖον εἶναι παντὶ ἰητρῶ περὶ φύσιος εἰδέναι ('I assert that the science [of medicine] is the knowledge of what a human is and the causes for his existence...since I believe that it is necessary for every physician to be knowledgeable about nature').

106 So Bostock 1986: 136-37.

107 Sedley 1998: 25.

108 The dramatic date of *Smp.* is 416 BCE following the playwright Agathon's first victory. But there is a very good likelihood that Plato's depiction of medicine and physicians here does not accurately represent ideas and opinions circulating at least 30 years before the dialogue was composed, perhaps between 384 and 379 BCE (see Dover 1980: 9-10 for dating). See further Dodds 1990: 18 for his comments on the dramatic date of *Gorgias*: 'We must conclude either that Plato did not care how his readers situated his fictions in time...or that he deliberately lifted the present fiction [out of its historical context].'

As part of the discussion on the topic of *Eros*, Plato has the historical Athenian physician Eryximachus comment on the nature of *Eros* from the perspective of his profession (186b-188e).¹⁰⁹ Although there is some scholarly debate about the tone of Eryximachus' speech, it is generally regarded as overly pedantic and laced with medical jargon.¹¹⁰

Plato's characterization of Eryximachus serves as an illustration of what happens when the balance between [intellectual] investment and detachment is not present in the medical practitioner. It is when Eryximachus represents the more narrowly defined and most technical elements of the medical practice that we find Plato most critical of him.

Plato's resistance to medical thought in the context of philosophical discussions (what Rosen calls 'medical humanism') is that it is a craft (τέχνη) aimed at the preservation of life, whether or not it is a good life. This interest potentially places it in opposition to the ethical philosopher's goal of understanding the 'good.'¹¹¹

Plato's Eryximachus begins his speech on *Eros* by stating his debt to his medical craft (ἄρξομαι δὲ ἀπὸ τῆς ἰατρικῆς λέγων). His claim is that both love and disease are located in the body, and therefore both affect the 'nature of bodies' (φύσις τῶν σωματῶν, 186b2-4). Despite Eryximachus' interest in studying the body as the locus for disease, the descriptions of its parts are virtually absent in his discussion. His main concern is to follow contemporary medical theories of the balance of bodily substances through repletion (πλησμονή) and depletion (κένωσις) in order to diagnosis (διαγιγνώσκειν) the flux of good and bad love (186c-d). This understanding of *Eros* is further augmented by his theories of medical opposites of bodily

109 Plato mentions him elsewhere at *Prt.* 315c and *Phdr.* 268a (Craik 2001b: 109).

110 Brill 2006: 24. Craik 2001b: 110 n. 7 provides a full bibliography of earlier assessments of Eryximachus' speech. Edelstein 1945 is the strongest defender for the physician. He writes (88): '[I]f Eryximachus is reproached for the "dogmatism of his profession in trying to make good his pedantic correction of his predecessors," one should point out that the other speakers are dogmatic as well.' Levin 2009: 275 acknowledges some shifting of thought in the past decade, which has had, 'a salutary impact on explorations of [Eryximachus'] *logos*.' Nevertheless, she contends that scholars might have gone too far out of their way both to criticize and to praise Eryximachus.

111 Rosen 1968: 93.

qualities.¹¹² Eryximachus' speech is classical medicine at its most abstracted: the material body ceases to be part of the object of enquiry (like in Thucydides' description of the plague). Instead, it encroaches upon the domain of natural philosophy and its search for the basic abstract constituents of the material world, where disease *per se* cannot be located.

Aristophanes, whose speech immediately follows Eryximachus', dwells more upon the construction of the body in his own fanciful account of *Eros*.¹¹³ Aristophanes begins by claiming that *Eros* is an ally (ἐπικουρός) of humans and a physician (ἰατρός) for treating those problems that trouble them the most (189d1-2). He explicitly marks his imitation of Eryximachus' medically oriented discussion by stating that he will discuss 'human nature' (ἀνθρωπίνη φύσις, 189d5).¹¹⁴ Next he explains the original form of humans: they were once conjoined in tandem at their fronts, forming a single body with four arms, four legs, and two faces attached to one neck. Because the gods felt threatened by their size and power, Zeus decided to split them in half with his lightning bolt. He next ordered Apollo, who among other responsibilities was a god of healing, to 'treat' (ἰάσθαι) the freshly torn bodies of humans (190d-e).¹¹⁵

The description of Apollo's procedure appears to imitate the technical anatomical terms coined by physicians (190e-191b). The god began by suturing the original wound (now the front of the torso, στήθη) where the two bodies were split. He then stitched together the loose skin (δέρμα) creating 'the now so-called belly' (ἡ γαστήρ νῦν καλουμένη). The resulting suture

112 See Thivel 2004 and Craik 2001b: 109-10 for further discussions of Eryximachus' language of pathology and Plato's possible medical sources. For similar theories in the HC, see *Aph.* 2.22, *Flat.* 1, *Epid.* 6.8.7, and *Nat. Hom.* 9.

113 My analysis of Aristophanes' speech follows Craik 2001b, although I place greater emphasis on the anatomical imagery. See Hooper 2013, von Moellendorf 2009, and Dover 1980: 112-14 for discussions of myth in Aristophanes' speech. I limit my discussion to the first part, in which medical imagery is most strongly emphasized (189d-191d). Aristophanes follows with his famous explanation of the origin of sexual orientations (191d-193e). Dover 1966 remains one of the best overviews of Plato's possible intellectual and literary influences in his description. More recent scholarly interest in this section is primarily focused upon what it suggests about gender as a construct, e.g. Sandford 2010: ch. 2, Groneberg 2005, and Ludwig 1996.

114 For examples of this expression in the HC see *Vict.* 2, *Flat.* 6, *Morb. Sacr.* 18, *Nat. Hom.* 1, and *VM* 7.

115 Cf. *Ar. Av.* 584 for Apollo as a working physician who takes payment (μισθοφορεῖν) for his services (see further Griffin 2004: 613).

formed a ‘mouth’ (στόμα), a word regularly used in the HC for ‘orifice,’¹¹⁶ that became ‘what they call the navel’ (ὁ τὸν ὀμφαλὸν καλοῦσι).¹¹⁷ The language is an absurd blend of technical language and the humour of comedic theatre. As we have seen, the qualifier καλεῖν was regularly used by physicians to mark specialized terms in their writings. Here, however, Aristophanes earmarks the basic anatomical terms γαστήρ and ὀμφαλός. As Craik has noted, we also see two metaphors in this passage, which are common in anatomical descriptions, to explain the results of Apollo’s procedure: the bellies are like stitched pouches (ὥσπερ τὰ σύσπαστα βαλλάντια, 190e8); and the divided bodies now resemble slices of flat-fish (ὥσπερ αἱ ψῆτται, 191d4).¹¹⁸

Plato here illustrates how comic playwrights could appropriate medical vocabulary, especially anatomical terms, as part of their humour. The extent to which Plato might have been imitating the historical Aristophanes is unclear. Dover detects some elements of humour in the speech that has parallels in Aristophanes’ plays;¹¹⁹ however, he argues that Plato also might have been drawing upon the works of other Old and Middle Comedy poets for inspiration, including Pherecrates and Antiphanes. He continues to claim that the core idea of these conjoined ‘original’ bodies is more akin to Hesiod’s creation accounts, the fables of Aesop, and Presocratic accounts of human origins than to comic theatre.¹²⁰ Although such parallels are difficult to ignore, Dover overlooks similarities of this passage to Aristophanes’ *Birds*, a play that contains

116 E.g. *Aēr.* 21 (of the womb), *Vict.* 56 (of blood vessels), *Epid.* 2.4.5 (the vagina), *Prorrh.* 2.14 (the opening of a wound).

117 Observed by Craik 2001b: 113.

118 For examples, see *Int.* 47 (ὥσπερ κύμα, ‘like a wave,’ the movement of phlegm and bile in the abdomen); *Aph.* 4.79 (ὥσπερ τρίχες, ‘like hairs,’ fibres in urine); *Mul.* 9 (ὥσπερ ἀράχνια, ‘like spider webs,’ morbid menstrual fluid).

119 E.g. Plato’s Aristophanes comments that boys who submit to older male lovers make the best politicians (192a2-7). Dover sees the conclusion of *Ar. Nub.* as a likely source for this notion, where the ‘Honest Argument’ remarks that εὐρύπροκτοι (‘wide-asses’) are best suited for political life (1088 ff.).

120 Dover 1966, esp. 41-42 and 44.

mythical stories of creation (specifically of birds), imitation of contemporary scientific thought, and literary allusions (including to Aesop).¹²¹

The image presented by the character of Aristophanes can be interpreted as a medical monstrosity, both in the absurdity of the language and in its comparison to inanimate objects. We have already seen how comic playwrights including Aristophanes used similar methods to create grotesque bodies. Plato's depiction of Aristophanes may indicate the continued (or even increased) use of such devices in the Middle Comedies that were being performed when the *Symposium* was written. Moreover, as with Eryximachus' speech, Plato has used technical terminology (or a comic impression of it) as a way to comment obliquely upon the limits of medical knowledge. Both speakers provide accounts for the physical body that cannot be used to explain the true nature of love. Similar to Anaxagoras in the passage from *Phaedo* quoted above, the characters Eryximachus and Aristophanes both lack the proper methodological approaches to ethical philosophy and therefore rely on 'ungrounded opinion (δόξα)' to form their conclusions.¹²²

7.3.2. *Timaeus*

In contrast to the *Symposium*, the *Timaeus*, usually dated to his later period writings (ca. 360-47 BCE), contains a detailed and serious investigation into human anatomy and physiology that is uncharacteristic of Plato.¹²³ It has often been observed that this treatise is somewhat of an

121 Craik 2001b: 110-11. See also Hunter 2004: 64-65 for a list of further parallels between Aristophanes' passage here and the historical poet's plays.

122 Bury 1909: lvii. So Rosen 1968: 134.

123 Taylor 1926: 436 for example places *Ti.* after *Sph.* (360 BCE). This later date, however, has been questioned most strongly by Owen 1953, who argues that it is a middle dialogue and locates it after *R.* but before *Prm.* and *Th.* (Plato provides a summary of key points of *R.* at *Ti.* 17c1-19b2, which provides a relative point of composition [see Taylor 1928: 3-4, and Guthrie 1975: 437 for the completion of *R.* ca. 374 BCE].) Stylometric studies have suggested (although not entirely confirmed) *Ti.*'s late position in the dialogues (see especially the rebuttal to Owen by Cherniss 1957). See Zeyl 2000: xvi-xx for further discussion of the problem. The dramatic date of the dialogue is more easily fixed to within a few years before the peace of Nicias in 421 BCE (Taylor 1928: 16).

anomaly among his dialogues.¹²⁴ In addition to its unusual subject matter, the dialogue is dominated by Timaeus of Locri, who we are told was a preeminent philosopher in his own right (20a).¹²⁵ Plato's understanding of the body parts in the work is limited, and he seems to have a peculiar understanding of their functions;¹²⁶ however, his descriptions are clearly appropriated from the medical art (ἰατρική), a debt that he acknowledges early in the dialogue (24c1). The majority of the anatomical terms in the dialogue are either common or rare (and likely technical) words that appear in earlier Athenian drama. Plato's use of these rare words suggests a growing familiarity with medical language among the educated elite in the 4th century. There are also a few exceptional examples that provide stronger evidence for Plato's direct engagement with contemporary medical terminology.

In his account, Plato's Timaeus makes the human body the intermediate point in connecting the natural world with the soul. He first describes the body as being composed of the four elements present in the universe (fire, water, earth, and air). Timaeus continues to explain that the divine builder or *demiurge* created this structure to contain the immortal soul, thereby making it a microcosm of the universe (69b-d). Like other material things, the body is subject to corruption, which is the cause of all diseases (νόσοι).¹²⁷ There are three principal reasons for this:

- 1) The elements within specific parts of the body become imbalanced due to one element's unnatural increase or movement (82a-b).

124 E.g. Kalkavage 2001: 1: 'The *Timaeus* is the strangest of Plato's dialogues'; Broadie 2011: 4: 'Timaeian cornerstones stick out as philosophically offensive anomalies'; Sallis 1999: 3: '[the *Timaeus* is] a dialogue of strangeness; even saying that it is utterly singular does not go far enough.'

125 It is uncertain whether Timaeus was a historical figure, since there is scarce evidence of him outside of this dialogue. Cornford 1937: 2-3 believed that he is Plato's own creation. Taylor 1928: 17-18, however, defends Timaeus' existence, and suggests that he was most influenced by Pythagoreanism.

126 As Longrigg 1993: 135 remarks, 'Plato's knowledge of internal anatomy [in the *Timaeus*] is of a very low order and is patently not based upon any human, or even animal, dissection.'

127 See Grams 2009, Fedorova 1998, Miller 1962, and Taylor 1928: 587-89 for further discussions of Plato's medical ideas in the *Ti*.

- 2) The structures of the body (e.g. marrow, bone, flesh, and sinew) decay into more basic materials (82b-84c).
- 3) Specific substances including air, phlegm, and bile become trapped within parts of the body (84c-86a).

Plato's interests in the material construction of the body and disease in this work are principally linked to his concept of the soul: 'what happens to one affects the other.'¹²⁸ Because of this connection, the soul can be corrupted by similar excesses, specifically bodily pleasure and pain (86b-c). As parts of his broader discussion to explain this, he describes the internal locations of the tripartite soul and provides a detailed account of the anatomy in each region.¹²⁹

Plato rarely mentions internal body parts in his dialogues outside of this work, with the exception of the heart (καρδία). For example, he describes it beating (*Smp.* 215e2, *Ion* 535c8) and comments that it is a place where the hemlock will travel during Socrates' execution (*Phd.* 118a3). Plato provides a fuller picture of its physical appearance in the *Timaeus*: it is a knot of vessels (τὴν δὲ δὴ καρδίαν ἄμμα τῶν φλεβῶν, 70a7-8), and is nested and cushioned by the lungs (τὸν πλεύμονα...περὶ τὴν καρδίαν αὐτὸν περιέστησαν οἶον μάλαγμα, 70d2-3). The *Timaeus* is, again, where we see almost all of Plato's references to other internal organs. Some of these are general anatomical terms that regularly appear in non-technical writings, but rarely elsewhere in his own writings. Only here does Plato mention things like the lungs (πλεύμονες) located in the 'spirited' (τὸ θυμοειδές) part of the body,¹³⁰ or the liver (ἥπαρ), intestines (ἔντερα), and spleen (σπλήν) located in the 'appetitive' (τὸ ἐπιθυμητικόν) region.¹³¹ At each place he describes their appearance and function.¹³² His main focus on the brain (ἐγκέφαλος) –

128 Stalley 1996: 358.

129 See *R.* 435b-445e for an earlier discussion of Plato's division of the soul within the body and Miller 2009 for a useful overview.

130 Cornford 1937: 284.

131 Cornford 1937: 286.

132 E.g. πλεύμονα: 70c (on the appearance of the lungs), 84d (on their function); ἥπαρ: 72b (on the appearance of the liver), 71b (on its function); ἔντερα: 73a (the function of the intestines); σπλήν: 72c (the function and location of the spleen).

the rational part of the body – is also in the *Timaeus*,¹³³ although he mentions it in passing twice elsewhere in the context of thought.¹³⁴

This focus upon the body and its health secured the *Timaeus* as a medical treatise in antiquity. Galen apparently considered the dialogue worthy enough to write a lost commentary on it.¹³⁵ The 1st century CE medical doxography *Anonymous Londinensis* (PBrLibr inv. 137), or the so-called Menon Papyrus (after the possible author, a student of Aristotle), records Plato as an authority on disease, and his name is placed first among those theorists who believe that the body is composed of elements. The author of this text continues by providing a summary of the relevant extract from the *Timaeus* on the subjects of anatomy and disease (69c-87a) to explain the reason for Plato's inclusion among medical theorists (14-18).¹³⁶ Cornford has proposed that the similarity of his theories of disease to those of the physician Diocles of Carystus (*ca.* 400 – *ca.* 300 BCE) suggests that both were relying upon the roughly contemporary work of Philistion of Locri (*fl.* 400-350 BCE).¹³⁷ According to the second letter attributed to Plato, Philistion was a physician to Dionysius II.¹³⁸ Although the letter has generally been considered spurious on

133 63b, 73d, 76a, and 76d; see Cornford 1937: 293 and Taylor 1928: 518-19 for discussions.

134 *Hyp. Ma.* 292d6 and *Phd.* 96b5.

135 Parts of the commentary are preserved in Arabic summaries. See Runia 1986: 55 n. 114, and 55-57 for a survey of other ancient commentaries on *Ti.*

136 For discussions of the Menon Papyrus and *Timaeus*' place in it, see Nutton 2004: 18-19, Tracy 1969: 25-26 and 77-78, Jones 1947, esp. 1-8 (also the standard text and translation), and Steckerl 1945. For a discussion of the history of the Menon Papyrus and its relationship with classical Greek medical theories, see Manetti 1982; on the papyrus as a doxographical work, see Manetti 1999.

137 Cornford 1937: 333-34 and 341. See van der Eijk 2000: xxxi-xxxiv for the problematic dating of Diocles' life.

138 Nutton 2004: 72-73 identifies Philistion's understanding of the causes of disease as the 'imbalance between the body's elements, the failure of the body to function properly, and external factors such as woundings, excessive heat or cold, and bad food.' See Longrigg 1993: 80-81, Miller 1962, and Jones 1947: 19 for further discussion. See Smith 1979: 75 for discussion of Galen's comment at *Anat. Admin.* 900-1 K that Philistion (and all other 'ancients') were ignorant about many parts of the body while developing their theories of disease.

conceptual grounds,¹³⁹ it is still possible that it is historically accurate and that Plato had direct contact with Philistion during his second visit to Syracuse (367 or 366 BCE).

The anatomical vocabulary in the *Timaeus*, however, does not appear to have been introduced to an Athenian audience by either Plato or Diocles. Besides appearing in Hippocratic treatises, most of Plato's terms are seen in earlier 5th century Athenian writings. Seven rare anatomical terms are used in earlier drama:

- 1) ἄρτηρία (channels, sc. of the lungs), 70d2, 78c5: Sophocles (*Tr.* 1054);
- 2) ὁ καλουμένος θώραξ ('the so-called *thorax*'), 69e4: Aristophanes (*V.* 1195) and Euripides (*HF* 1095);
- 3) κύτος (*trunk*), e.g. 74a3, 78c2: Sophocles (*Tr.* 12);
- 4) ἡ ὀνομαζομένην κάτω κοιλία ('the so-named *lower abdomen*'), 73a3: Aristophanes (*Ra.* 485);
- 5) νωτιαίος (adj. of the back, sc. μυελός [*marrow*, 74a1]; φλέβες [*vessels*, 77d2]): Euripides (sc. ἄρθρα [*joints*, *El.* 841]);
- 6) ῥαφαί (*sutures*, sc. of the skull), 76a5: Euripides (*Supp.* 503, *Ph.* 1159)
- 7) σφονδύλος (*vertebra*), 74a2: e.g. Euripides (*El.* 841, *Ph.* 1413), Aristophanes (*V.* 1489).

The previous appearances of these terms in Athens shows that they were already known at least to the educated elite several decades before the *Timaeus*. This may suggest that some technical anatomical vocabulary was becoming more widely diffused by the 4th century, perhaps through an increased circulation of medical writings; however, Plato's cautious marking of two of these terms (the 'so-called' θώραξ and 'so-named' κάτω κοιλία) strongly suggests that not all medical anatomical terms had been fully naturalized among the broader intellectual elite. I can see no reason for him to have included such qualifiers if these anatomical terms had become a

139 See for examples Press 2000: 17 n.6, Edelstein 1966: 145-52, Rist 1965: 79-80, and Bluck 1960. For general discussions of the authenticity of Plato's letters, see Skemp 1976: 9-11 and Easterling and Knox 1985: 480-81. Swift Riginos 1976: 70 n.1 correctly notes that even if these letters are spurious, it is still likely that Plato travelled to Sicily and that he was involved in the court of Dionysus II. See Nails 2009: 5-10 for an overview of Plato's visits to the island, which she accepts as historically true.

part of common speech, i.e. unmarked as belonging to a specific group. Rather, Plato's expressions seem to be signals to his readers that he was using the authoritative technical vocabulary of medicine, regardless of where else his audience might have been exposed to them (e.g. tragedy or comedy).

Two terms in the *Timaeus* do not appear in earlier extant Athenian writings: διάφραγμα (*diaphragm*) and φλεβία (*small vessels*, perhaps capillaries or nerves). Another word has a different meaning: ἴνες (*fibrine* of the blood). The same vocabulary in Hippocratic writings provides further evidence that Plato was consciously drawing upon medical terminology to support his work.

διάφραγμα: diaphragm

The first example is διάφραγμα (*diaphragm*, the muscle dividing the thorax from the abdomen, 70a1 and 84d7).¹⁴⁰ Thucydides uses it once in the context of a partition within a sanctuary (1.133.1). This sense of 'barrier' appears to have led to its specific anatomical meaning. Hippocratic authors use the term only a few times to mean the diaphragm.¹⁴¹ *Epidemics* 5.95 (a passage repeated with minor changes at 7.121) is especially notable, because it can be located both chronologically and geographically to Plato's Athens. Other sections of this treatise

140 The more common term for the diaphragm in the HC is φρένες, e.g. *Morb.* 7.72, *Epid.* 2.4.2, *Morb. Sacr.* 17, and *Prorrh.* 2.9.

141 *Epid.* 5.95 and 7.121; *Coac.* 425. *Hp. Virg.* 1 preserves the variant διάφραξις. (Cf. *Epid.* 2.2.24: the velum of the palate; and *Arist.* 492b16: cartilage of the nose.) The later Anon. Parisinus *On Acute and Chronic Disease* 1 (= fr. 72 DK) also reports Diocles' use of the word: ὁ δὲ Διοκλῆς φλεγμονὴν τοῦ διαφράγματός φησιν εἶναι τὴν φρενίτιν ('Diocles said that phrenitis is the inflammation of the *diaphragm*.'). It is uncertain from this context, however, whether Diocles would have actually used the term διάφραγμα. For both the themes discussed in *On Acute and Chronic Disease* and the difficulty in dating it, see van der Eijk 2000: xv. The author's references to the Hellenistic physician and anatomist Erasistratus (*fl.* 250 BCE) means that the work as it stands must be post-Classical. Erotian later uses the term in his definition of κοιλίη (*Onom.* 86): κοιλίη· πᾶσα ἡ ὑπὸ τὸ διάφραγμα εὐρυχωρία, καὶ ἡ τοῦ θώρακος δὲ ἐνίοτε ('*koiliē*: the entire cavity below the *diaphragm* or sometimes the cavity of the *thorax*').

describe the treatment of Athenians (cases 9 and 10). Here in case 59 the author describes a catapult injury during the siege of Datum (Macedonia) by Philip II (358-357 BCE):¹⁴²

ἔδοκε δέ μοι ὁ ἰητρὸς ἐξαίρέων τὸ ξύλον ἐγκαταλιπεῖν τι τοῦ δόρατος κατὰ τὸ διάφραγμα.

It seems to me that the doctor left a part of the shaft below [the patient's] diaphragm after removing the spear.

This internal evidence provides good reason to suspect that Plato was influenced by new vocabulary of Hippocratic physicians who were active in Athens during the mid-4th century.

Plato first uses διάφραγμα in its literal sense to describe the ‘barrier’ between the torso and the abdomen formed by the φρένες (the more common term for ‘diaphragm’), which separates the ‘spirited’ and ‘appetitive’ regions of the torso (70a1); however, the word appears again later without such qualification (84d-e):¹⁴³

ὅταν μὲν γὰρ ὁ τῶν πνευμάτων τῷ σώματι ταμίης πλεύμων μὴ καθαρὰς παρέχη τὰς διεξόδους ὑπὸ ρευμάτων φραχθεῖς, ἔνθα μὲν οὐκ ἰόν, ἔνθα δὲ πλεῖον ἢ τὸ προσήκον πνεῦμα εἰσιὸν τὰ μὲν οὐ τυγχάνοντα ἀναψυχῆς σήπει, τὰ δὲ τῶν φλεβῶν διαβιαζόμενον καὶ συνεπιστρέφον αὐτὰ τήκον τε τὸ σῶμα εἰς τὸ μέσον αὐτοῦ διάφραγμα τ’ ἴσχον ἑναπολαμβάνεται, καὶ μυρία δὴ νοσήματα ἐκ τούτων ἀλγεινὰ μετὰ πλήθους ἰδρώτος πολλάκις ἀπείργασται.

When the lungs, the dispensers of air to the body, are obstructed by humors, they do not permit a clear passage. At some places the air cannot get in, while at others more than the appropriate amount gets in. In the former case, there will be parts of the body that don't get any breath and so begin to decay, while in the latter case the air forces its way through the veins and twists them together like strands. It makes its way into the central region of the body, the region that contains the diaphragm, where it is shut in, thereby causing the body to waste away. These factors produce countless painful diseases, often accompanied by profuse perspiration.

This passage illustrates the usefulness of medical anatomical models to Plato. The diaphragm provided an effective reference-point for dividing an otherwise confusing mass of internal parts, thereby allowing him to reduce the body into a more comprehensible system. We can easily

142 Jouanna 1999: 390.

143 Tr. Zeyl 1997 with minor changes.

imagine Plato simply using the more familiar term φρένες to express this division. But διάφραγμα, with its primary meaning of ‘barrier,’ strengthens his claim that there is a clear boundary between the spirited and the appetitive regions. Furthermore, the appearance of the word at *Epidemics* 5.95 offers tantalizing evidence to suspect that Plato might have been appropriating some technical medical language that was in circulation in Athens when he composed the *Timaeus*; however, the limited use of the word with this sense means that such conclusions must be tentative.

ἴνες: fibres

Plato uses the word ἴνες (*fibres*) in an uncommon way that suggests similarly restricted medical influences. We have seen the term elsewhere in Aristophanes where it means muscle fasciae, or broad tendons that envelop muscle groups (*Pax* 86). In the *Timaeus*, the word appears in a different sense to mean fibres that are found in blood (or ‘fibrine’) which cause it to coagulate when it cools (85d). In the HC, this meaning of ἴνες is restricted to two 5th century treatises: *Fleshes* 8 in an explanation for the formation of the liver through congealed blood; and *Diseases* 2.47 in a description of draining excess fluid from an inflamed lung. *Fleshes* in particular suggests an influence upon Plato’s medical thought, since the work as a whole posits concepts of disease similar to those attributed to Philistion mentioned above.¹⁴⁴ Aristotle was also apparently influenced by these theories, and frequently used the term in the same sense.¹⁴⁵ It is difficult to imagine that this meaning of ἴνες, *fibrine* of blood, would have much currency outside of the fields of medicine and natural philosophy, and it seems that Plato was inspired by a small group of physicians who thought that these fibres were important for understanding health and disease.

144 Lloyd 1964a, esp. 92-93. Both the author of *Fleshes* and Philistion (followed by Plato in the *Timaeus*) considered health to be a balance of the four elements (air, fire, earth, and water) that possess specific qualities (cold, hot, dry, and wet), although the authors assign different qualities to each element.

145 E.g. *PA* 651a3-4, where he describes these fibres as ‘firm’ (στερεόν) and ‘earthlike’ (γεώδες). See also *Met.* 384a31 and *HA* 520a1.

φλέβια: small vessels

These fibres in Plato's model travel through the blood vessels (φλέβες). He is particularly interested in blood vessels in his project, since they are responsible for delivering good and bad materials to the various parts of the body, causing both health and disease.¹⁴⁶ Nowhere else in his writings does he mention these vessels. The term φλέβες is not technical, despite physicians' particular interest in the vessels. Plato, however, also uses the diminutive φλέβιον (*small vessel*) to refer to particular types of cord-like structures within the body (e.g. nerves, capillaries, and smaller veins), and this form of the word does appear to be borrowed from medicine.

At 65c-d Plato explains that such φλέβια are located in the tongue. In his model, they are responsible for conveying taste: the earth-like material of food is first dissolved through contact with the moisture in the mouth's flesh. The material is then absorbed by these small vessels that distribute taste to the body. Cornford cautiously remarks that since there is no mention of blood in this passage, Plato might have been thinking not of blood vessels, but rather, of 'very fine tubes conveying the liquid of liquefied substances we taste into the veins proper.'¹⁴⁷ Taylor for similar reasons suggests that these φλέβια are probably nerves.¹⁴⁸ Plato mentions the term again later in a discussion of the breakdown of flesh as a cause of disease (84e). The worst result is when air becomes trapped in the body and causes the sinews (νεῦρα) and small vessels (φλέβια) in the muscles at the back of the neck (ἐπιτονοί) to become inflamed.¹⁴⁹ The effects of this are the diseases he calls *tetanos* (τέτανος) and *opisthotonos* (ὀπισθότονος).¹⁵⁰

146 E.g. 79a: διὰ τοῦ σώματος τὰ τῶν φλεβῶν ποιεῖ ῥεύματα. ('The vessels convey flux throughout the body.')

147 Cornford 1937: 270.

148 Taylor 1928: 465.

149 The location of the swelling is unclear in the text. See Cornford 1937: 341 for this interpretation, which relies upon identifying the demonstrative adverb ταύτη ('there') with the ἐπιτονοί (the word appears again at Pl. *Lg.* 945c5 and Arist. *HA* 515b9).

150 The distinction between the two diseases was apparently a fine one (both terms are formed from the verb τείνειν, 'to stretch'): *Coac.* 355 classifies them together; *Morb.* 3.13 states that *opisthotonos* causes the back to arch, and the legs and arms to become immovable; *Aph.* 5.65 describes a similar arching of the back and rigidity for those suffering from *tetanos*; both diseases cause the jaw to become locked (e.g. *Int.* 52, *Epid.* 5.47).

The diminutive φλέβιον in these two passages provides good reason to suspect Plato's engagement with medical models of the body, since the word-form occurs in classical writings only in technical medical and biological works. The author of *Internal Diseases* describes the 'small hollow veins' (τὰ κοῖλα φλέβια, 5) that are spread out in the lungs (πλεύμονες). Elsewhere, he explains that small vessels also run to the kidneys (νεφρά, 15). The author of *Wounds to the Head* describes blood-filled thin vessels in the skull, which are very thin and hollow;¹⁵¹ *Places in Humans* tracks φλέβια (possibly nerves?) from the brain to the eyes (2).¹⁵² Later, he makes an interesting distinction between φλέβες and φλέβια when summarizing his previous discussion of vessels (6):

φλέβες αἱ γεγραμμένοι πασιν ὁμοίως εἰσιν, ἄλλα τε φλέβιά εἰσιν ἄλλοις, ἀλλ' οὐκ ἄξια λόγου.

The vessels described are similar in all people; however, other small vessels differ between people, and these are not worth discussing.¹⁵³

Aristotle also describes these small vessels extending from the brain to the heart (*GA* 744a4), and mentions them frequently elsewhere.¹⁵⁴ In each of these instances, the more common term φλέβες probably would have sufficed for a casual description; however, similar to Plato, these authors were attempting to produce accurate descriptions of the human body. They recognized that some cords in the body were clearly different (both in size and in function) from what were more commonly known as φλεβές, and that such differences were significant enough to deserve a specific label.

151 Ἐνι δ' ἐν τῷ ὀστέῳ καὶ φλέβια λεπτότερα καὶ κοιλότερα, αἵματος πλέα.

152 Craik 1998a *ad loc.* proposes that these are the optic nerves, which the author perhaps observed from the dissection of animals.

153 His point does not appear to be that these small vessels are unimportant in a study of human anatomy, but rather that he cannot describe them accurately because they differ from person to person.

154 E.g. *HA* 514a17 (for the thin vessels running to the meninges [μῆνιγξ] of the brain) and *Spir.* 483b29 (for vessels running from the vena cava to the lungs).

Plato's anatomical vocabulary in the *Timaeus* suggests a class of 4th century educated elites that was becoming increasingly familiar with medical discourse and vocabulary. Although his voyage to Sicily and his likely exposure to Western Greek medical thought while he was there might have influenced his theories of disease, there is no indication that he brought back significantly new anatomical knowledge or vocabulary. The majority of his vocabulary was part of the common vernacular (e.g. καρδία, πλεύμονες, στήθος) that is found in both technical and non-technical writings. A second group of anatomical terms that Plato uses are more rare, yet already attested in earlier 5th century theatre. Several of these words appear in the dialogue without qualification, which may suggest that Plato anticipated an audience that would have been familiar with their meaning. The handful of terms that are unmarked (i.e. by κληῖν) or that are unattested in previous non-technical writings offer some evidence that Plato was specifically appropriating some terms that an audience would have recognized as belonging properly to the medical profession. Plato's frequent remarks about medicine in this dialogue and elsewhere means that he must have had some exposure to medical discourse and that he was able to draw upon it when appropriate.

The apparent incongruity between Plato's avoidance of the topic elsewhere in his dialogues (at least as a topic of serious enquiry) and the full treatment in the *Timaeus* can be resolved if we see him as having adopted an alternative approach to examine the place of humans within the cosmos:¹⁵⁵

Plato has not abandoned human affairs for cosmogony and natural science. His purpose is to place man in the world and draw out the implications for human life and aims.

Medicine provided Plato with models of the body and disease that helped him to explain his own philosophical ideas. In the words of Plato's eponymous *Timaeus* – and I think we can attribute

155 Guthrie 1978: 246.

this to Plato's own thoughts – the account given in the treatise still only represented a 'likely story' (εἰκὸς μῦθος): certain truth about bodies and their creation, both celestial and our own, remains elusive to humans (28c9-29d3):

ὁ λέγων ἐγὼ ὑμεῖς τε οἱ κριταὶ φύσιν ἀνθρωπίνην ἔχομεν, ὥστε περὶ τούτων τὸν εἰκότα μῦθον ἀποδεχομένους πρέπει τούτου μηδὲν ἔτι πέρα ζητεῖν.

I the speaker and you the judges have a human nature, so we should accept the likely story about these things. We should not seek anything beyond this.

In Plato's mind, our 'human nature' (φύσις ἀνθρωπίνη) limits our ability to know the sensible world because of the fallibility of our own senses.¹⁵⁶ Any account of the natural world – including our own bodies, it seems – remains unfalsifiable and tentative.¹⁵⁷ This does not suggest that Plato completely rejected medical investigations.¹⁵⁸ On the contrary, the sources that he drew upon offered useful support for his greater argument for an intelligent design to the body. It was evident to an educated 4th century audience that medicine as a craft (τέχνη) provided useful tools, including special names for parts, that could help to understand the body, disease, and most importantly the soul better. For Plato, however, physicians still only offered provisional models for the human body and its functions; they did not ultimately provide the universal truth that he sought.

7.4. Conclusions

In this chapter I have attempted to illustrate the broader influence of medical anatomical vocabulary upon late 5th and especially 4th century Athenian prose writers. As we might expect, though, it was restricted to special circumstances. Herodotus, the earliest of the four prose authors I have examined, appears to have been especially interested in reporting non-Greek

¹⁵⁶ So Cornford 1937: 31.

¹⁵⁷ Naddaf 1998: x and Kalkavage 2001: 16-17. See also Taylor 1928: 75: 'it is reasonable to stipulate that [Plato's following account] shall be at least "as probable as the alternative proposed by anyone else".'

¹⁵⁸ As Vlastos 1995: 266-79 reminds us, Plato's qualification of *Timaeus* as a 'likely story' does not mean that we should not take the account seriously. So Zeyl 2000: xxiii-xxv.

cultures' different ways of treating the body. Only a few instances suggest that he was exposed to medical vocabulary. Thucydides limited nearly all of his descriptions of the human body to his account of the plague of Athens. If he was familiar with contemporary medical discourse (which he seems to have been), he chose not to draw upon it when discussing the bodies of those infected.

The evidence from Xenophon and Plato provides the strongest indications that technical anatomical vocabulary was more broadly diffused among the Athenian educated elite during the first half of the 4th century. Technical vocabulary in Xenophon's and his predecessor Simon's technical treatises on animals seems to have been a useful way to assert their authority on the subject matter. Plato appears to have been specifically interested in how (and sometimes in whether) these models for the body could be useful outside of their medical contexts. In his *Symposium*, the absent medical body in Eryximachus' speech and the absurd medical body in Aristophanes' illustrate his reservations about medicine's encroachment upon philosophy. In the *Timaeus*, though, Plato engages most directly with medical thought as a viable way to explore (if not to definitively prove) conceptions of the universe and of human existence.

The evidence suggests that a broader class of 4th century intellectual elites had found an appropriate place for medical anatomical vocabulary in their own attempts to understand and to articulate to others what a living thing 'is.' The ordered bodies described by Xenophon and Plato contrast with the strange and destabilizing anatomies that appear in earlier 5th century drama. But the appropriation of these special terms appears to have been restricted. Prose authors did not use technical words to describe any particular individual (or horse or dog, as the case may be), but rather to construct typologies for the nature (φύσις) of bodies in general. We see this distancing in Aristophanes' fanciful depiction of conjoined humans, and also in Xenophon's and

Simon's models of the ideal foal. Plato in the *Timaeus* also restricts such vocabulary to his model of the universal human body. As we have seen, this was the usual approach of Hippocratic authors. If Dover is correct that non-medical prose writers avoided detailed anatomical descriptions because of their potential obscenity, it is possible that special medical terminology offered non-medical authors a means to distance 'the body' from 'my body.' In this way they could construct an abstracted yet still accessible model of a living thing, something that could be explored with (dis)interest rather than with disgust.

Final Conclusions and Summary

This project represents the most complete study of archaic and classical Greek anatomical terminology to date. My primary goals have been to assess Hippocratic authors' possible contributions to Greek anatomical vocabulary and to track non-medical author's appropriation of these terms in the Classical period. In doing so, I have expanded upon previous studies to illustrate further how Hippocratic writers were augmenting traditional understandings of the human body and how and to what extent the broader intellectual elite responded to these new concepts. Through this case study of anatomical terms, I have also sought to contribute to our understanding of the conceptual negotiation that occurs when a specific group's new ideas are disseminated among the broader population.

In chapter 1, I discussed how a study of anatomical terminology can be a useful way for us to understand ancient Greek constructions of the human body and how they can change. In chapter 2, I demonstrated that the Greek language already possessed a rich set of anatomical terms at least by the time that the Homeric poems found literary form (*ca.* 750 BCE). Several terms in the poems, however, either do not appear in later classical writings or are restricted to poetic works. Furthermore, the Homeric poems preserve a set of words with meanings that suggest a different way of imagining the body than we see in later classical Greek writings. This provides strong evidence for changing constructions of the human body in Greek thought over the course of the archaic period.

In chapter 3, I have argued that Greek medical writers needed to expand upon preexisting anatomical terminology in order to relate the more nuanced constructions of the body that they were observing. To explore their contributions to Greek anatomical knowledge, I have examined

medical approaches to the body, which extended beyond living bodies in a clinical setting to animal bodies and perhaps human corpses. The ‘new’ things that they were seeing required new names. These approaches encouraged term-creation for specific body parts, especially for divisions of the superficial body and for those parts that were identified as channels and containers for bodily fluids. Moreover, I have proposed that several examples of the qualifier *καλεῖν* (*so-called*) provide evidence that Greek medical writers were aware of their specialized vocabulary for the body and that special markers were needed to help a broader audience (potentially both physicians and laypeople) to identify some terms. Such sensitivity to clarity of meaning provides further indication that at least some Hippocratic authors were preparing their works for an audience that extended beyond their immediate intellectual circles.

In the following chapters I argued that laypeople’s interests both in the ‘scientific’ methodologies of medicine and in physicians’ potential ability to extend life were key reasons for a broader dissemination of medical ideas during the 5th and 4th centuries BCE. A byproduct of this dissemination was that non-medical intellectual elites were also exposed to novel ways to describe the human body. These new ideas about ‘what a human is’ were met with a mixture of fascination, anxiety, and scepticism.

Tragedians appear to have been among the first non-medical writers to appropriate the burgeoning new anatomical terminology of medicine in Athens. These new words, or new meanings of common words in the case of metaphors, were congruent with poetic language and therefore easily integrated into drama. As a supplement to poetic vocabulary, these terms helped to reinforce grotesque imagery of dramatic bodies, usually in the context of corporeal suffering. Medical anatomical vocabulary in early comic theatre appears to have been a parodic response to the appearance of this new terminology on the tragic stage; however, in late 5th and 4th century

comedies, we see more evidence that comic playwrights were engaging directly with medical thought. This appears to suggest that the general public was becoming increasingly familiar with medical ideas. In nearly all instances, though, technical anatomical vocabulary in comedy was still used to emphasize the potential absurdity of these new constructions of the body.

Classical Athenian prose authors' use of medical anatomical terminology provides further evidence of the broader intellectual elite's growing familiarity with medical thought. We find limited use of such vocabulary in the 5th century histories of Herodotus and Thucydides, but there are far more examples in the 4th century writings of Xenophon and Plato. I argued that both of these authors appropriated medical terms as a way to elucidate their subjects and to assert their authority on them, yet examples from Plato's *Symposium* and *Timaeus* suggest that at least some medical terms (and medical approaches to the body in general) had yet to be completely absorbed by the broader intellectual elite. By the mid-4th century, medical models of the body, although increasingly more familiar to the broader population, still seem to have been unusual, which meant that they could continue to be used to challenge common concepts about human nature.

There is still much work that can be done on the subject of classical Greek anatomical vocabulary, and it is my hope that this project has provided a more solid foundation for future studies. For example, I have only been able to touch upon the large question of what anatomical word-use suggests about broader Greek perceptions of the relationship between animals and humans. I have observed that some terms in the Homeric poems tend to be restricted more narrowly to either animals or humans than we see in later classical writings. It is worth asking whether these and similar patterns illustrate a narrowing conceptual gap in Greek thought during the 5th and 4th centuries BCE. Specifically, do these differences indicate that elite notions about

humankind's central position in the universe were themselves changing, and (more tentatively) could it be that medical authors had inadvertently contributed to this change through their materialistic approach to exploring human existence? Another question for further focused enquiry is what general anatomical terms can tell us about the geographical and chronological contexts of specific Hippocratic writings. One potentially fruitful approach is to systematically compare terminology in these medical treatises to that of identifiable non-medical authors.¹ Patterns of word choice for commonly described anatomical parts (e.g. the belly, the neck, and the chest) could improve our understanding of the obscure origins of some of these writings.

Above all else, I hope to have shown in this project that asking 'what is a human?' can be a worthy pursuit, whether we are interested in our own culture's perceptions or in those of a very different culture 2500 years ago. If we compare these notions, we will find that the human body is not entirely a *tabula rasa* or a 'simple piece of wood each has cut and trimmed to suit him.'² Certain points of subtle wonder remain constant – for example, our beating hearts or the eyes in all their complexity – that provide basic familiar (and perhaps comforting) points of access to another culture's ways of interpreting the world and our shared place as humans within it. But through the process of identifying and attempting to understand the differences, we are also challenged to consider our own broader ideologies and the underpinnings behind them. The body is a marvellous thing to consider, and we can learn much by doing so.

1 This is essentially the opposite approach to the one I have taken in my project, since it requires the identification of general anatomical words that appear to be restricted to a specific dialect (e.g. Ionic/Attic/Doric).

2 Van Gennep 1960: 72.

References

- Adams, J.N. 1995. *Pelagonius and Latin Veterinary Terminology in the Roman Empire*. Brill.
- Adkins, A.W.H. 1970. *From Many to One: A Study of Personality and Views of Human Nature in the Context of Ancient Greek Society, Values and Beliefs*. Cornell University Press.
- Aers, D. 1992. "A Whisper in the Ear of Early Modernists; Or, Reflections on Literary Critics Writing the 'History of the Subject'," in D. Aers (ed.), *Culture and History 1350–1600: Essays on English Communities, Identities and Writing*. Wayne State University Press. 177-202.
- Aleshire, S.B. 1989. *The Athenian Asklepieion: The People, Their Dedications, and the Inventories*. J.C Gieben.
- Alexanderson, B. 1963. *Die Hippokratische Schrift Prognostikon*. Almqvist & Wiksell.
- Alexandridis, A. 2009. "Shifting Species: Animal and Human Bodies in Attic Vase Painting in the 6th and 5th Centuries B.C.," in T. Fögen and M.M. Lee (eds.), *Bodies and Boundaries in Graeco-Roman Antiquity*. de Gruyter. 261-83.
- Allan, W. 2005. "Tragedy and the Early Greek Philosophical Tradition," in J. Gregory (ed.), *A Companion to Greek Tragedy*. Blackwell. 71-82.
- Althoff, J. 2005. "Form und Funktion der beiden hippologischen Schriften Xenophons *Hipparchus* und *De re equestri* (mit einem Blick auf Simon von Athen)," in T. Fögen (ed.), *Antike Fachtexte: Ancient Technical Texts*. de Gruyter. 235-52.
- _____ 1993. "Herodot und die griechische Medizin," in K. Döring and K. Wöhrle (eds.), *Antike Naturwissenschaft und Ihre Rezeption* 3. Colibri. 1-16.
- Amberger-Lahrman, M. 1996. *Anatomie und Physiognomie in der hellenistischen Plastik*. Akademie der Wissenschaften und der Literatur.
- Anderson, E.R. 2003. *Folk-taxonomies in Early English*. FDU Press.
- Anderson, J.K. 1960. "Notes on Some Points in Xenophon's ΠΕΡΙ ΙΠΠΙΚΗΣ," *JHS* 80: 1-9.
- Apostolakis, E., G. Apostolaki, M. Aposolaki, and M. Chorti. 2010. "The Reported Thoracic Injuries in Homer's *Iliad*," *Journal of Cardiothoracic Surgery* 5 114: 1-9.
- Arnott, W.G. 2010. "Middle Comedy," in G.W. Dobrov (ed.), *Brill's Companion to the Study of Greek Comedy*. Brill. 279-331.
- _____ 1965. "Some Notes on the Text and Fragments of the Comic Poet Alexis," *Hermes* 93.3: 298-310.

- Asheri, D., A. Lloyd, and A. Corcella. 2007. *A Commentary on Herodotus, Books 1-4*. Oxford University Press.
- Avery, H.C. 1965. "Heracles, Philoctetes, Neoptolemus," *Hermes* 93.3: 279-297.
- Austin, C. and S.D. Olson 2004. *Aristophanes: Thesmophoriazusae*. Oxford University Press.
- Ayache, L. 1997. "L'animal, les hommes et l'ancienne médecine," in B. Cassin and J.-L. Labarrière (eds.), *L'animal dans l'antiquité*. Bibliothèque d'histoire de la philosophie. 55-74.
- Bader, D.W. 2010. *Platonic Craft and Medical Ethics*. (Diss.) University of Toronto.
- Badger, J.N. 2013. *Sophocles and the Politics of Tragedy: Cities and Transcendence*. Routledge.
- Bakhtin, M. 1984. *Problems in Dostoevsky's Poetics*. Tr. C. Emerson. Manchester University Press.
- _____ 1965. *Rabelais and His World*. Tr. H. Iswolsky. The M.I.T. Press.
- Balzer, W. and A. Eleftheriadis. 1991. "A Reconstruction of the Hippocratic Humoral Theory of Health," *Journal for General Philosophy of Science* 22: 207-27.
- Battezzato, L. 2012. "Pythagorean Comedies from Epicharmus to Alexis," *Aevum Antiquum* 8: 139-164.
- Beerden, K. 2013. *Worlds Full of Signs: Ancient Greek Divination in Context*. Brill.
- Bélis, A. 1995. "Cithares, citharistes et citharôdes en Grèce," *CR Acad. Inscr.* 139.4: 1025-65.
- Benveniste, E. 1965. "Termes gréco-latins d'anatomie," *Rev. Phil.* 91: 7-13.
- Bers, V. 2010. "Kunstprosa: Philosophy, History, Oratory," in E.J. Bakker (ed.), *A Companion to the Ancient Greek Language*. Wiley-Blackwell. 455-67.
- Berthiaume, G. 1982. *Les rôles du mâgeiros: Étude sur la boucherie la cuisine et le sacrifice dans la Grèce ancienne*. Leiden.
- Berzins McCoy, M. 2013. *Wounded Heroes: Vulnerability as Virtue in Ancient Greek Literature and Philosophy*. Oxford University Press.
- Biggs, P. 1966. "The Disease Theme in Sophocles' *Ajax*, *Philoctetes*, and *Trachiniae*," *C Phil.* 61.4: 223-35.
- Blackman, L. 2008. *The Body: Key Concepts*. Berg.
- Bluck, R.S. 1960. "The Second Platonic Epistle," *Phronesis* 5: 140-51.

- Bolens, G. 2000. *La logique du corps articulaire: Les articulations du corps humain dans la littérature occidentale*. Press Universitaires de Rennes.
- Bond, G.W. 1981. *Euripides: Heracles*. Clarendon Press.
- Borthwick, E.K. 1968. "The Dances of Philocleon and the Sons of Carcinus in Aristophanes' *Wasps*," *CQ* 18.1: 44-51.
- Bostock, D. 1986. *Plato's Phaedo*. Clarendon Press.
- Bowie, A.M. 2007. "Religion and Politics in Aeschylus' *Oresteia*," in M. Lloyd (ed.), *Oxford Readings in Classical Studies*. Oxford University Press. 323-358.
- Brendel, A. 1700. *de Homero Medico*. Schrödterus.
- Brill, S.A. 2006. "Medical Moderation in Plato's *Symposium*," *Studies in the History of Ethics* 11: 1-28.
- Broadie, S. 2011. *Nature and Divinity in Plato's Timaeus*. Cambridge University Press.
- _____. 2001. "Soul and Body in Plato and Descartes," *Proceedings of the Aristotelian Society* 101.1: 295-308.
- Brown, C.H. 1979. "A Theory of Lexical-change (with Examples from Folk Biology, Human Anatomical Partonomy and Other Domains)," *Anthropological Linguistics* 21 6: 257-76.
- _____. 1976. "General Principles of Human Anatomical Partonomy and Speculations on the Growth of Partonomic Nomenclature," *American Ethnologist* 3.3: 400-24.
- Buck, C.D. 1955. *The Greek Dialects* (2nd ed.). Chicago University Press.
- _____. 1949. *A Dictionary of Selected Synonyms in the Principal Indo-European Languages: A Contribution to the History of Ideas*. The University of Chicago Press.
- Buckley, T. 2010. *Aspects of Greek History 750-323 BCE: A Source-based Approach*. Routledge.
- Burkert, W. 1992. *The Orientalizing Revolution: Near Eastern Influence on Greek Culture in the Early Archaic Age*. Tr. M.E. Pinder and W. Burkert. Harvard University Press.
- _____. 1985. *Greek Religion*. Tr. J. Raffan. Harvard University Press.
- Bury, R.G. 1909. *The Symposium of Plato*. Cambridge University Press.
- Byl, S. 2011. *De la médecine magique et religieuse à la médecine rationnelle: Hippocrate*. Editions L'Harmattan.

- _____ 1990. "Le vocabulaire hippocratique dans les comédies d'Aristophane et particulièrement dans les deux dernières," *Rev. Phil.* 64: 151-62.
- Cameron, D. 1992. "Naming of Parts: Gender, Culture, and Terms for the Penis among American College Students," *American Speech* 67.4: 367-82.
- Campbell, F.R. 1888. *The Language of Medicine*. D. Appleton and Co.
- Canfora, L. 2006. "Biographical Obscurities and Problems of Composition," in A. Rengakos and A. Tsakmis (eds.), *Brill's Companion to Thucydides*. Brill. 1-31.
- Cañizares, P. 2010. "The Importance of Having Medical Knowledge as a Layman: The Hippocratic Treatise *Affections* in the Context of the Hippocratic Corpus," *Studies in Ancient Medicine* 35: 87-99.
- Carbone, A.L. 2011. *Aristote illustré: Représentations du corps et schématisation dans la biologie aristotélicienne. Les anciens et les modernes*. Classiques Garnier.
- Carter, R.B. 1983. *Descartes' Medical Philosophy: The Organic Solution to the Mind-body Problem*. The John Hopkins University Press.
- Cartledge, P. 1997. "Introduction," in R. Waterfield (tr.), *Xenophon: Hiero the Tyrant and Other Treatises*. Penguin. vii-xxxii.
- Casevitz, M. 1983. "Sur la fonction de la médecine dans le théâtre d'Aristophane," *Cahiers des études anciennes* 15: 5-27.
- Casewell, C.P. 1990. *A Study of Thumos in Early Greek Epic*. Brill.
- Cassio, A.C. 2002. "The Language of Doric Comedy," in A. Willi (ed.), *The Language of Greek Comedy*. Oxford University Press. 51-83.
- _____ 1985. "Two Studies on Epicharmus and his Influence," *Harv. Stud.* 89: 37-51.
- Catani, M. 2007. "From Hodology to Function," *Brain* 130: 602-5.
- Cawthorn, C. 2008. *Becoming Female: The Male Body in Greek Tragedy*. Bloomsbury.
- Centrone, B. 2005. "Die *Anterastai* und Platons erotische Dialoge," in K. Dèoring, M. Erler, and S. Schorn (eds.), *Pseudoplatonica*. Franz Steiner Verlag. 37-49.
- Ceschi, G. 2009. *Il vocabolario medico di Sofocle: Analisi dei contatti con il Corpus Hippocraticum nel lessico anatomico-fisiologico, patologico e terapeutico*. Istituto Veneto di Scienze.
- Chadwick, J. and W.N. Mann. 1950. *The Medical Works of Hippocrates*. Blackwell Scientific Publications.

- Chantraine, P. 1972. "Remarques sur la langue et le vocabulaire du *Corpus Hippocratique*," in *La Collection Hippocratique et son rôle dans l'histoire de la médecine*. Brill. 35-49.
- Chaudenson, R. 2001. *Creolization of Language and Culture*. Psychology Press.
- Cherniss, H. 1957. "The Relation of the *Timaeus* to Plato's Later Dialogues," *American Journal of Philology* 78.3: 225-266.
- Cheyns, A. 1983. "Le θυμός et la conception de l'homme dans l'épopée homérique," *Revue belge de philologie et d'histoire* 61: 20-86.
- Christopoulou-Aletra, H., P. Gigis, and G. Paraskevas. 2000. "Hippocratic Views with Reference to the Anatomical Characteristics of 'Arteries' and 'Veins'," *Internal Angiology* 19.4: 373-76.
- Clarke, M. 1999. *Flesh and Spirit in the Songs of Homer: A Study of Words and Myths*. Clarendon Press.
- Cohen, B. (ed.). 2000. *Not the Classical Ideal: Athens and the Construction of the Other in Greek Art*. Brill.
- Cohen, E. 1994. "The Body as a Historical Category: Science and Imagination, 1660-1760," in M. Winkler and L.B. Cole (eds.), *The Good Body: Aceticism in Contemporary Culture*. Yale University Press. 67-90.
- Collard, C. 2008. *Aeschylus: Persians and Other Plays*. Oxford University Press.
- _____ 1975. *Euripides: Supplices, Vol. 2*. Bouma's Boekhuis b.v. Publishers.
- Collinge, N.E. 1962. "Medical Terms and Clinical Attitudes in the Tragedians," *BICS* 9: 43-55.
- Collins, D. 2008. "Mapping the Entrails: The Practice of Greek Hepatoscopy," *American Journal of Philology* 129.3: 319-45.
- Colvin, S. 1999. *Dialects in Aristophanes and the Politics of Language in Ancient Greek Literature*. Clarendon Press.
- Combella, F.M. 1959. "Milman Parry and Homeric Artistry," *Comparative Literature* 11: 193-205.
- Connolly, A. 1998. "Was Sophocles Heroised as a *Dexion*?" *JHS* 118: 1-21.
- Cordes, P. 1994. *Iatros: Das Bild des Arztes in der griechischen Literatur von Homer bis Aristoteles*. Franz Steiner Verlag.
- _____ 1991. "Innere Medizin bei Homer?" *Rh. Mus.* 134: 113-20.

- Cornford, F.M. 1937. *The Cosmology of Plato*. Kegan Paul, Trench, Trübner and Co.
- Cosans, C.E. 1997. "Galen's Critique of Rationalist and Empiricist Anatomy," *Journal of the History of Biology* 30.1: 35-54.
- Craik, E.M. 2009a. "Hippocratic Bodily "Channels" and Oriental Parallels," *Medical History* 53: 105-116.
- _____ 2009b. *The Hippocratic Treatise On Glands*. Brill.
- _____ 2006a. "Horizontal Transmission in the Hippocratic Tradition," *Mnemos*. 59.3: 334-47.
- _____ 2006b. "Tragedy as Treatment: Medical Analogies in Aristotle's *Poetics*," in D. Cairns and V. Liapis (eds.), *Dionysalexandros: Essays on Aeschylus and his Fellow Tragedians in Honour of Alexander F. Garvie*. The Classical Press of Wales. 283-99.
- _____ 2006c. *Two Hippocratic Treatises: On Sight and On Anatomy*. Brill.
- _____ 2002. "Significant Language in Sophocles, *Antigone* 1192-1243," *Quaderni Urbinati di Cultura Classica* 70.1: 89-94.
- _____ 2001a. "Medical References in Euripides," *BICS* 45: 81-95.
- _____ 2001b. "Plato and Medical Texts: *Symposium*," *CQ* 51: 109-14.
- _____ 2001c. "Thucydides on the Plague: Physiology of Flux and Fixation," *CQ* 51: 102-8.
- _____ 1998a. *Hippocrates: Places in Man*. Clarendon Press.
- _____ 1998b. "The Hippocratic Treatise *On Anatomy*," *CQ* 48.1: 135-67.
- Cregan, K. 2009. *Theatre of the Body: Staging Death and Embodying Life in Early Modern London*. Brepolis.
- Crivellato, E. and R. Domenico. 2007. "A Portrait of Aristotle as an Anatomist," *Clinical Anatomy* 20: 477-85.
- Crombie, I.M. 1962. *Plato's Doctrines*. Taylor and Francis.
- Cropp, M. and G. Fick. 1985. *Resolution and Chronology in Euripides: The Fragmentary Tragedies*. Institute of Classical Studies.
- Csapo, E. 2010. "The Production and Performance of Comedy," in G.W. Dobrov (ed.), *Brill's Companion to the Study of Greek Comedy*. Brill. 103-42.

- Cunningham, A. and B. Andrews. 1997. "Introduction: Western Medicine as Contested Knowledge," in A. Cunningham and B. Andrews (eds.), *Western Medicine as Contested Knowledge*. Manchester University Press. 1-23.
- Dalby, A. 2003. *Food in the Ancient World from A to Z*. Routledge.
- Dalfen, J. 2009. *Minos: Übersetzung und Kommentar*. Vandenhoeck & Ruprecht.
- Daremborg, C.H. 1865. *La médecine dans Homère*. Librairie Académique.
- Davies, M. 1991. *Sophocles: Trachiniae*. Clarendon Press.
- Davis, M. 1980. "Socrates' Pre-Socratism: Some Remarks on the Structure of Plato's *Phaedo*," *The Review of Metaphysics* 33.3: 559-77.
- Dawson, W.R. 1986. "Herodotus as a Medical Writer," *BICS* 33.1: 87-96.
- De La Combe, P.-J. 2001. *L'Agamemnon d'Eschyle*. Presses Universitaires du Septentrion.
- De Romilly, J. 1984. *Patience, mon Coeur: L'essor de la psychologie dans la littérature grecque classique*. Société d'Édition "Les Belles Lettres."
- _____ 1979. *La douceur dans la pensée grecque*. Société d'Édition "Les Belles Lettres."
- De Vries, G.J. 1982. "A Note on Plato, *Phaedrus* 270 AC," *Mnemos.* 35.3/4: 331-333.
- Dean-Jones, L. 2003. "Literacy and the Charlatan in Ancient Greek Medicine," in H. Yunis (ed.), *Written Texts and the Rise of Literate Culture in Ancient Greece*. Cambridge University Press. 97-121.
- DeHart, S.M. 1999. "Hippocratic Medicine and the Greek Body Image," *Perspectives on Science* 7.3: 349-382.
- Deichgräber, K. 1935. *Hippokrates über Entstehung und Aufbau des menschlichen Körpers (Peri sarkon)*. Teubner.
- Delebecque, É. 1970. *Xenophon: L'art de la chasse*. Société d'Édition "Les Belles Lettres."
- DeMaitre, L.E. 2013. *Medieval Medicine: The Art of Healing, from Head to Toe*. ABC-Clio.
- Denniston, J.D. 1939. *Euripides: Electra*. Clarendon Press.
- Devine, A.M. and L.D. Stephens. 1981. "A New Aspect of the Evolution of the Trimeter in Euripides," *TAPA* 111: 43-64.
- Dillery, J. 2002. "Ephebes in the Stadium (Not the Theatre): *Ath. Pol.* 42.4 and *IG II2.351*," *CQ* 52.2: 462-70.

- _____ 1995. *Xenophon and the History of His Times*. Routledge.
- Dillon, J. 2004. "Euripides and the Philosophy of his Time," *Classical Association of Ireland* 11: 47-73.
- Dodds, E.R. 1990. *Plato: Gorgias*. Clarendon Press.
- _____ 1951. *The Greeks and the Irrational*. University of California Press.
- Dover, K.J. 1997. *The Evolution of Greek Prose Style*. Clarendon Press.
- _____ 1993. *Aristophanes: Frogs*. Clarendon Press.
- _____ 1987. "Language and Character in Aristophanes," in K. Dover, *Greek and the Greeks. Collected Papers, Vol. 1: Language, Poetry, Drama*. Blackwell. 237-48.
- _____ 1980. *Plato: Symposium*. Cambridge University Press.
- _____ 1972. *Aristophanic Comedy*. University of California Press.
- _____ 1968. *Aristophanes: Clouds*. Clarendon Press.
- _____ 1966. "Aristophanes' Speech in Plato's *Symposium*," *JHS* 86: 41-50.
- Doyen-Higuet, A.-M. 2012. "Contribution à l'étude du lexique hippiatrice grec," in S. Lazaris (ed.), *Le cheval dans les sociétés antiques et médiévales*. Brepolis. 213-22.
- Du Bois, P. 1996. "Sappho's Body in Pieces," in L.H. Lefkowitz (ed.), *Textual Bodies: Changing Boundaries of Literary Representation*. State University of New York Press. 19-34.
- Duminil, M.-P. 1998. *Hippocrate, Tome VIII: Plaies, nature des os, cœur, anatomie*. Société d'Édition "Les Belles Lettres."
- Dumortier, J. 1935. *Le vocabulaire médical d'Escyle et les écrits Hippocratiques*. Société d'Édition "Les Belles Lettres."
- Dunand, F. and R. Lichtenberg 2006. *Mummies and Death in Egypt*. Tr. D. Lorton. Cornell University Press.
- Durand, J.-L. 1989. "Greek Animals: Toward a Topography of Edible Bodies," in J.P. Vernant, and M. Detienne (eds.), *The Cuisine of Sacrifice Among the Greeks*. University of Chicago Press. 87-118.
- Earp, F.R. 1948. *The Style of Aeschylus*. Cambridge University Press.
- Easterling, P.E. 1988. "Tragedy and Ritual," *Metis* 3.1-2: 87-109.

- _____ 1982. *Sophocles: Trachiniaiæ*. Cambridge University Press.
- Easterling, P.E. and B.M.W. Knox (eds.). 1985. *The Cambridge History of Classical Literature*. Cambridge University Press.
- Edelstein, L. 1967. *Ancient Medicine: Selected Papers of Ludwig Edelstein*. The John Hopkins University Press.
- _____ 1966. *Plato's Seventh Letter*. Brill.
- _____ 1964. *The Hippocratic Oath*. The John Hopkins Press.
- _____ 1945. "The Role of Eryximachus in Plato's *Symposium*," *APA* 76: 85-103.
- Edwards, M.L. 1997. "Constructions of Physical Disability in the Ancient Greek World: The Community Concept," in D.T. Mitchell and S.L. Snyder (eds.), *The Body and Physical Difference: Discourses of Disability*. University of Michigan Press. 35-50.
- Eknoyan, G. 1988. "Origins of Nephrology: Hippocrates, the Father of Clinical Nephrology," *American Journal of Nephrology* 8.6: 498-507.
- Ellen, R. 1977. "Anatomical Classification and the Semiotics of the Body," in J. Blacking (ed.), *The Anthropology of the Body*. Academic Press. 342-73.
- Evans, M. 2001. "The 'Medical Body' as Philosophy's Arena," *Theoretical Medicine* 22: 17-32.
- Fagan, P. and J. Russon. 2009. *Reexamining Socrates in the Apology*. Northwestern University Press.
- Fedorova, O. 1998. "The Theory of Health and Disease in Plato's *Timaeus*," in K.J. Boudouris (ed.), *Philosophy and Medicine: Ninth International Conference on Greek Philosophy, Vol. 1*. Editions Ionia. 70-77.
- Fenik, B. 1968. *Typical Battle Scenes in the Iliad*. Franz Steiner Verlag.
- Ferrini, F. 1978. "Tragedia e patologia: Lessico ippocratico in Euripide," *Quaderni Urbinati di Cultura Classica* 29: 49-62.
- Filhol, E. 1989. "Hérakleïè Nosos: L'épilepsie d'Héraclès," *Rev. Hist. Rel.* 206.1: 3-20.
- Finkelberg, M. 2007. "Elitist Orality and the Triviality of Writing," in C.R. Cooper (ed.), *The Politics of Orality*. Brill. 293-306.
- Fisher, K.-D. 1988. "Ancient Veterinary Medicine: A Survey of Greek and Latin Sources and Some Recent Scholarship," *Medizinhistorisches Journal* 23.3/4: 191-209.

- Flemming, R. 2007. "Women, Writing, and Medicine in the Classical World," *CQ* 57.1: 257-79.
- Flintoff, E. 1986. "The Date of *Prometheus Bound*," *Mnemos.* 39: 82-91.
- _____ 1983. "Aristophanes and the *Prometheus Bound*," *CQ* 33.1: 1-5.
- Flower, M.A. 2008. *The Seer in Ancient Greece*. University of California Press.
- Foley, H. 2000. "The Comic Body in Greek Art and Drama," in B. Cohen (ed.), *Not the Classical Ideal: Athens and the Construction of the Other in Greek Art*. Brill. 275-311.
- Foucault, M. 1990. *The History of Sexuality, Vol. 1. An Introduction*. Tr. R. Hurley. Vintage.
- Fowler, H.N. 1971. *Plato, Vol. 1*. Harvard University Press (The Loeb Classical Library).
- Fraenkel, E. 1950. *Aeschylus: Agamemnon, Vol. 3*. Clarendon Press.
- Fratkin, E. 1996. "Traditional Medicine and Concepts of Healing among Samburu Pastoralists of Kenya," *Journal of Ethnobiology*. 16.1: 63-97.
- Fredrich, W.H. 2003. *Wounding and Death in the Iliad: Homeric Techniques of Description*. Duckworth and Co.
- Frölich, H. 1879. *Die Militärmedizin Homers*. Ferdinand Enke.
- Furdell, E.L. 2002. *Publishing and Medicine in Early Modern England*. University of Rochester Press.
- Fyfe, W.H. 1973. *Aristotle: Poetics*. Harvard University Press (The Loeb Classical Library).
- Gantz, T. 1993. *Early Greek Myth: A Guide to Literary and Artistic Sources*. The John Hopkins University Press.
- Gardiner, E.N. 1906. "The *Pankration* and Wrestling," *JHS* 26: 4-22.
- Garland, R. 1981. "The Causation of Death in the *Iliad*: A Theological and Biological Investigation," *BICS* 28: 43-60.
- Gaskin, R. 1990. "Do Homeric Heroes Make Real Decisions?," *CQ* 40: 1-15.
- Gavrylenko, V. 2005. "Homeric Body Image: $\chi\rho\acute{\omega}\varsigma$ as Body," *Magisterium* 19: 45-50.
- Geller, M.J. 2010. *Ancient Babylonian Medicine: Theory and Practice*. Wiley-Blackwell.
- Gill, L. and I.R. Alfageme. 1972. "La figura del médico en la comedia ática," *Cuadernos de filología clásica* 3: 35-92.

- Gleason, M.W. 2009. "Shock and Awe: The Performance Dimension of Galen's Anatomy Demonstrations," in C. Gill, T. Whitmarsh, and J. Wilkins (eds.), *Galen and the World of Knowledge*. Cambridge University Press. 85-114.
- Gocer, A. 1999. "Hesuchia, a Metaphysical Principle in Plato's 'Moral Psychology'," *Apeiron* 32.4: 17-36.
- Godquin, B. 1990. "Homère était-il chirurgien?," *Chirurgie* 116.2: 136-43.
- Goffart, C. 2000. *L'obstétrique et le vocabulaire du grec ancien*. Connaissance Hellenique.
- Goldhill, S. 2002. *The Invention of Prose*. Cambridge University Press.
- Goldman, B. 2014. *The Secret Language of Doctors*. HarperCollins.
- Good, B. 1994. *Medicine, Rationality, and Experience: An Anthropological Perspective*. Cambridge University Press.
- Gordon, A.H. and C.W. Schwabe. 2004. *The Quick and the Dead: Biomedical Theory in Ancient Egypt*. Brill – Styx.
- Grams, L. 2009. "Medical Theory in Plato's *Timaeus*," *Rhizai* 6.2: 161-92.
- Grant, J.R. 1983. "Some Thoughts on Herodotus," *Phoenix* 37.4: 283-98.
- Gray, H. and W.H. Lewis. 1918. *Anatomy of the Human Body* (20th ed.). Lea & Febiger.
- Gray, V. 1998. *The Framing of Socrates: The Literary Interpretation of Xenophon's Memorabilia*. Franz Steiner Verlag.
- _____ 1985. "Xenophon's *Cynegeticus*," *Hermes* 113: 156-72.
- Green, R. 2002. "Towards a Reconstruction of Performance Style," in P. Easterling and E. Hall (eds.), *Greek and Roman Actors: Aspects of an Ancient Profession*. Cambridge University Press. 95-105.
- Griffin, J. 1980. *Homer on Life and Death*. Clarendon Press.
- Griffin, M. 2004. "Apollo's Hawk at Aristophanes, *Birds* 516," *CQ* 54.2: 610-13
- Griffith, D. 1998. "Corporeality in the Ancient Greek Theatre," *Phoenix* 52.3/4: 230-56.
- Griffith, M. 1977. *The Authenticity of Prometheus Bound*. Cambridge University Press.
- Grmek, M.D. 2002. "The Concept of Disease," in M.D. Grmek and B. Fantini (eds.), *Western Medical Thought from Antiquity to the Middle Ages*. Harvard University Press. 241-58.

- _____ 1989. *Diseases of the Ancient World*. Johns Hopkins University Press.
- Grmek, M.D. and R. Wittern. 1977. "Die Krankheit des attischen Strategen Nikias und die Nierenleiden im Corpus Hippocraticum," *Archives internationales d'histoire des sciences* 27: 3-32.
- Groeneboom, P. 1966. *Aeschylus' Agamemnon*. Adolf M. Hakkert.
- Groneberg, M. 2005. "Myth and Science around Gender and Sexuality: Eros and the Three Sexes in Plato's *Symposium*," *Diogenes* 208: 39-49.
- Gross, C.G. 1998. "Galen and the Squealing Pig," *History of Neuroscience* 4: 216-21.
- Garcia Gual, C. 2000. "Introduction," in C. Garcia Gual (ed.), *Tratados hipocraticos* 1. Gredos. x-xxxii.
- Guardasole, A. 2000. *Tragedia e medicina nell'Atene del V secolo a.C.* M. D'Auria editore.
- Gundert, B. 2000. "Soma and Psyche in Hippocratic Medicine," in J.P. Wright and P. Potter (eds.), *Psyche and Soma: Physicians and Metaphysicians on the Mind-body Problem from Antiquity to Enlightenment*. Clarendon Press. 13-35.
- _____ 1992. "Parts and their Roles in Hippocratic Medicine," *Isis* 83.3: 453-65.
- Guthrie, W.K.C. 1978. *A History of Greek Philosophy, Vol. 5. The Later Plato and the Academy*. Cambridge University Press.
- _____ 1975. *A History of Greek Philosophy, Vol. 4. Plato: The Man and his Dialogues. Early Period*. Cambridge University Press.
- _____ 1965. *A History of Greek Philosophy, Vol. 2. The Presocratic Tradition from Parmenides to Democritus*. Cambridge University Press.
- Hadot, I. 1984. *Arts libéraux et philosophie dans la pensée antique*. Etudes augustiniennes.
- Hainsworth, B. 1993. *The Iliad: A Commentary, Vol. 3. Books 9-12*. Cambridge University Press.
- Halliwel, S. 1987. *The Poetics of Aristotle*. Duckworth.
- Hamilton, R. 1985. "Euripidean Priests," *HSCP* 89: 56-59.
- Hammond, M. 1987. *Homer: The Iliad*. Penguin Books.
- Harauz, G. and M.J. Bronskill. 1979. "Comparison of the Liver's Respiratory Motion in the Supine and Upright Positions: Concise Communication," *Journal of Nuclear Medicine* 20.7: 733-35.

- Harpham, G.G. 1982. *On the Grotesque: Strategies of Contradiction in Art and Literature*. Princeton University Press.
- Harris, C.R.S. 1973. *The Heart and the Vascular System in Ancient Greek Medicine*. Clarendon Press.
- Harrison, T. 2003. "Upside Down and Back to Front: Herodotus and the Greek Encounters with Egypt," in R. Matthews and C. Roemer (eds.), *Ancient Perspectives on Egypt*. UCL Press. 145-56.
- Harrow Feen, R. 1983. "The Moral Basis of Graeco-Roman Medical Practice," *Journal of Religion and Health* 22.1: 39-48.
- Hartigan, K. 2005. "Drama and Healing: Ancient and Modern," in H. King (ed.), *Health in Antiquity*. Routledge. 162-79.
- Hartog, F. 1988. *The Mirror of Herodotus: The Representation of the Other in the Writing of History*. Tr. J. Lloyd. University of California Press.
- Haslam, M. 1997. "Homeric Papyri and Transmission of the Text," in I. Morris and B.P. Powell (eds.), *A New Companion to Homer*. Brill. 55-100.
- Hawley, R. 1998. "The Dynamics of Beauty in Classical Greece," in D. Montserrat (ed.), *Changing Bodies, Changing Meanings: Studies on the Human Body in Antiquity*. Routledge. 37-79.
- Heinrich, L.N. 2008. *The Afterlife of Images: Translating the Pathological Body Between China and the West*. Duke University Press.
- Henderson, J. 1991. *The Maculate Muse: Obscene Language in Attic Comedy* (2nd ed.). Oxford University Press.
- Henry D. 1880. "The Medicine and Surgery of Homer," *The British Medical Journal* 1.993: 48-51.
- Herter, H. 1976. "The Problematic Mention of Hippocrates in Plato's *Phaedrus*," *ICS* 1: 22-42.
- Hesk, J. 2003. *Sophocles: Ajax*. Duckworth.
- Higgins, W.E. 1977. *Xenophon the Athenian: The Problem of the Individual and the Society of Polis*. SUNY Press.
- Hillman, D. 2007. *Shakespeare's Entrails: Belief, Scepticism and the Interior of the Body*. Palgrave MacMillan.
- Hillman, D. and C. Mazzio (eds.). 1997. *The Body in Parts: Fantasies of Corporeality in Early Modern Europe*. Routledge.

- Hoey, T.F. 1979. "The Date of the *Trachiniae*," *Phoenix* 33.3: 210-232.
- Hoffman, H.A. and D.S. Jordan. 1892. "A Catalogue of Fishes of Greece, with Notes on the Names Now in Use and Those Employed by Classical Authors," *Proceedings of the Academy of Natural Sciences of Philadelphia* 44: 230-286.
- Hofmann, J.B. 1950. *Etymologisches Wörterbuch des Griechischen*. R. Oldenbourg.
- Hogan, J.C. 1984. *A Commentary on the Complete Greek Tragedies: Aeschylus*. University of Chicago Press.
- Holliday, A.J, and J.C.F. Poole. 1979. "Thucydides and the Plague of Athens," *CQ* 29.2: 282-300.
- Holmes, B. 2010a. *The Symptom and the Subject: The Emergence of the Physical Body in Ancient Greece*. Princeton University Press.
- _____ 2010b. "Body, Soul, and Medical Analogy in Plato," in K. Bassi and J.P. Euben (eds.), *When Worlds Elide: Classics, Politics, Culture*. Lexington Books. 345-85.
- _____ 2008. "Euripides' Heracles in the Flesh," *Cl. Ant.* 27.2: 231-281.
- _____ 2007. "The *Iliad*'s Economy of Pain," *TAPA* 137.1: 45-84.
- Hooper, A. 2013. "The Greatest Hope of All: Aristophanes on Human Nature in Plato's *Symposium*," *CQ* 63.2: 567-79.
- Hornblower, S. 1991. *A Commentary on Thucydides, Vol. 1. Books I-III*. Clarendon Press.
- Horrocks, G. 1997. "Homer's Dialect," in I. Morris and B.P. Powell (eds.), *A New Companion to Homer*. Brill. 193-217.
- Horstmanshoff, H.F.J. 1990. "The Ancient Physician: Craftsman or Scientist?," *Journal of the History of Medicine and Allied Sciences* 45: 176-97.
- Hughes, A. 2012. *Performing Greek Comedy*. Cambridge University Press.
- Hunter, R. 2006. "Homer and Greek Literature," in R. Fowler (ed.), *Cambridge Companion to Homer*. Cambridge University Press. 235-253.
- _____ 2004. *Plato's Symposium*. Oxford University Press.
- Irby-Massie, G.L. 2008. "*Prometheus Bound* and Contemporary Trends in Greek Natural Philosophy," *GRBS* 48: 133-57.

Ireland, S. and F.L. Steel. 1975. "Phrenes as an Anatomical Organ in the Works of Homer," *Glotta* 53: 183-95.

Irigoin, J. 1980. "La formation du vocabulaire de l'anatomie en grec: Du mycénien aux principaux traités de la collection hippocratique," in M.D. Grmek (ed.), *Les Maladies à l'aube de la civilisation occidentale. Recherches sur la réalité pathologique dans le monde grec préhistorique, archaïque et classique*. Payot. 247-257.

Irwin, E. 2005. *Solon and Early Greek Poetry: The Politics of Exhortation*. Cambridge University Press.

Isenberg, S.K. and D.E. Owen 1977. "Bodies, Natural and Contrived: The Work of Mary Douglas," *Religious Studies Review* 3: 1-17.

Jaeger, W. 1965. *Paideia: The Ideals of Greek Culture, Vol. I. Archaic Greece, The Mind of Athens*. Oxford University Press.

_____ 1944. *Paedeia: The Ideals of Greek Culture, Vol. 3. The Conflict of Cultural Ideals in the Age of Plato*. Oxford University Press.

Jahn, T. 1987. *Zum Wortfeld ‚Seele-Geist‘ in der Sprache Homers*. C.H. Beck.

Janko, R. 1992. *The Iliad: A Commentary, Vol. 4. Books 13-16*. Cambridge University Press.

Jebb, R.C. 1908. *The Trachiniae of Sophocles*. Cambridge University Press.

Jebb, R.C., W.G. Headlam, and A.C. Pearson. 1917. *The Fragments of Sophocles*. Cambridge University Press.

Joly, R. 1960. *Recherches sur le traité pseudo-hippocratique du régime*. Société d'Édition "Les Belles Lettres."

Jones, R.H. 2008. "Good Sex and Bad Karma: Discourse and the Historical Body," in V.K. Bhatia, J. Flowerdew, and R.H. Jones (eds.), *Advances in Discourse Studies*. Routledge. 245-257.

Jones, W.H.S. 1953. *Hippocrates, Vol. 4*. Harvard University Press (The Loeb Classical Library).

_____ 1947. *The Medical Writings of Anonymus Londinensis*. Cambridge University Press.

_____ 1946. *Philosophy and Medicine in Ancient Greece*. Ares Publishers.

_____ 1923a. *Hippocrates, Vol. 1*. Harvard University Press (The Loeb Classical Library).

_____ 1923b. *Hippocrates, Vol. 2*. Harvard University Press (The Loeb Classical Library).

Jouanna, J. 2012. *Greek Medicine from Hippocrates to Galen: Selected Papers*. Brill.

- _____ 2005. "Cause and Crisis in Historians and Medical Writers of the Classical Period," in P.J. van der Eijk (ed.), *Hippocrates in Context*. Brill. 3-28.
- _____ 2002. "The Birth of Western Medical Art," in M.D. Grmek and B. Fantini (eds.), *Western Medical Thought from Antiquity to the Middle Ages*. Tr. A. Shugaar. Harvard University Press. 22-71.
- _____ 2000. "Maladie et médecine chez Aristophane," in J. Leclant and J. Jouanna (eds.), *Le théâtre grec antique: La comédie*. Société d'Édition "Les Belles Lettres." 171-195.
- _____ 1999. *Hippocrates*. Tr. M.B. DeBevoise. John Hopkins University Press.
- _____ 1996. *Hippocrate: Airs, eaux, lieux*. Budé.
- _____ 1983. "Le sommeil médecin (Sophocle, *Philoctète* v. 859 ἀλεῖς ὕπνος)," in *Theatre et spectacles dans l'antiquité*. Brill. 49-62.
- Kahn, A.D. 1970. " 'Every Art Possessed by Man Comes from Prometheus': The Greek Tragedians and Science and Technology," *Technology and Culture* 11.2: 133-162.
- Kalkavage, P. 2001. *Plato's Timaeus*. Focus Publishing.
- Kamerbeek, J.C. 1980. *The Plays of Sophocles. Commentaries, Part 4: The Philoctetes*. Brill.
- _____ 1970. *The Plays of Sophocles. Commentaries, Part 2: The Trachiniae*. Brill.
- _____ 1963. *The Plays of Sophocles. Commentaries, Part 1: The Ajax*. Tr. H. Schreuder. Brill.
- Katz-Anhalt, E. 1993. *Solon the Singer: Politics and Poetics*. Rowman & Littlefield.
- Kelsey, S. 2004. "Causation in the *Phaedo*," *Pacific Philosophical Quarterly* 85: 21-43.
- Keränen, L. 2001. "The Hippocratic Oath as Epideictic Rhetoric: Reanimating Medicine's Past for its Future," *Journal of Medical Humanities* 22.1: 55-68.
- King, H. 2013. *The One-Sex Body on Trial: The Classical and Early Modern Evidence*. Ashgate Publishing.
- _____ 1998. *Hippocrates' Woman: Reading the Female Body in Ancient Greece*. Routledge.
- Kitts, M. 2005. *Sanctified Violence in Homeric Society: Oath-making Rituals and Narratives in the Iliad*. Cambridge University Press.
- Koerner, O. 1922. "Wie entstanden die anatomischen Kenntnisse in *Ilias* und *Odyssee*?" *Münchener Medizinische Wochenschrift* 69: 1484-7.
- Koller, H. 1958. "ΣΩΜΑ bei Homer," *Glotta* 37: 276-81.

- König, H.E. and H-G. Liebich 2007. *Veterinary Anatomy of Domestic Mammals*. Schattauer Verlag.
- Konstan, D. 2011. "Socrates in Aristophanes' *Clouds*," in D.R. Morrison (ed.), *The Cambridge Companion to Socrates*. Cambridge University Press. 75-90.
- Kornell, M. 2000. "Illustrations from the Wellcome Library: Vesalius's Method of Articulating the Skeleton and a Drawing in the Collection of the Wellcome Library," *Medical History* 44: 97-110.
- Kosak, J.C. 2006. "The Male Interior: Strength, Illness and Masculinity in Sophocles' *Philoktetes*," *BICS* 87: 49-64.
- _____ 2004. *Heroic Measures: Hippocratic Medicine in the Making of Euripidean Tragedy*. Brill.
- Kudlien, F. 1985. "'Klassen' - Teilung der Ärzte bei Aristoteles," in P. Moraux and J. Wiesner (eds.), *Aristoteles: Werk und Wirkung, Vol. 2. Aristoteles und seine Schule*. de Gruyter. 427-35.
- _____ 1969. "Antike Anatomie und menschlicher Leichnam," *Hermes* 97.1: 78-94.
- _____ 1965. "Zum Thema 'Homer und die Medizin'," *Rh. Mus.* 108: 293-9.
- Kuriyama, S. 1999. *The Expressiveness of the Body and the Divergence of Greek and Chinese Medicine*. Zone Books.
- Langholf, V. 2004. "Structure and Genesis of Some Hippocratic Treatises," in H.F.J. Horstmannshoff, M. Stoll, and C.R. van Tilburg (eds.), *Magic and Rationality in Ancient Near Eastern and Graeco-roman Medicine*. Brill. 219-75.
- _____ 1990. *Medical Theories in Hippocrates: Early Texts and the Epidemics*. de Gruyter.
- _____ 1986. "Kallimachos, Komödie und hippokratische Frage," *Medizinhistorisches Journal* 21.1/2: 3-30.
- Laqueur, T.W. 1992. *Making Sex: Body and Gender from the Greeks to Freud*. Harvard University Press.
- Lardinois, A.P.M.H. 2006. "Have We Solon's Verses?," in J.H. Blok and A.P.M.H. Lardinois (eds.), *Solon of Athens: New Historical and Philological Approaches*. Brill. 15-65.
- Lascaratos, J. and S. Marektos. 1988. "Ophthalmological Lore in the *Corpus Hippocraticum*," *Documenta Ophthalmologica* 68: 35-45.
- Leder, D. 1992. "Parted Bodies, Departed Souls: The Body in Ancient Medicine and Anatomy," in D. Leder (ed.), *The Body in Medical Thought and Practice*. Springer. 101-22.

- _____ 1992. "Introduction," in D. Leder (ed.), *The Body in Medical Thought and Practice*. Springer. 1-15.
- Lee, K.J. 1997. *Euripides: Ion*. Aris & Phillips.
- Leek, F.F. 1969. "The Problem of Brain Removal During Embalming by the Ancient Egyptians," *The Journal of Egyptian Archaeology* 55: 112-16.
- Leftwich, G.V. 1995. "Polykleitos and Hippocratic Medicine," in W.G. Moon (ed.), *Polykleitos, the Doryphoros, and Tradition*. The University of Wisconsin Press. 38-51.
- Leumann, M. 1950. *Homerische Wörter*. Wissenschaftliche Buchgesellschaft.
- Levin, S.B. 2009. "Eryximachus' Tale: The *Symposium's* Role in Plato's Critique of Medicine," *Apeiron* 42.4: 275-308.
- Lewis, J. 2006. *Solon the Thinker: Political Thought in Archaic Athens*. Duckworth.
- Lewis, V.B. 2006. "Plato's *Minos*: The Political and Philosophical Context of the Problem of Natural Right," *The Review of Metaphysics* 60.1: 17-53.
- Leven, K.-H. 2005. *Antike Medizin: Ein Lexikon*. C.H. Beck.
- Lidz, J.W. 1995. "Medicine and Metaphor in Plato," *The Journal of Medicine and Philosophy* 20: 527-41.
- Lipshutz, H. 1963. "Hand, Arm, and Shoulder Trauma in the *Iliad*," *Surgery* 54: 833-6.
- Littré, É. 1839-61. *Oeuvres complètes d'Hippocrate*. J.-B. Baillière. 10 vols.
- Llewellyn-Jones, L. 2010. *Ctesias' History of Persia: Tales of the Orient*. Routledge.
- Lloyd, A.B. 1976. *Herodotus: Book 2, Commentary 1-98*. Brill.
- _____ 1975c. *Herodotus: Book 2, Introduction*. Brill.
- Lloyd, G.E.R. 2003. *In the Grip of Disease: Studies in the Greek Imagination*. Oxford University Press.
- _____ 1993. *Methods and Problems in Greek Science: Selected Papers*. Cambridge University Press.
- _____ 1987. *The Revolutions of Wisdom: Studies in the Claims and Practices of Ancient Greek Science*. University of California Press.
- _____ 1985. "Animali e piante," in M. Vegetti (ed.), *Il sapere degli antichi*. Turin. 246-61.

- _____ 1983. *Science, Folklore and Ideology: Studies in the Life Sciences in Ancient Greece*. Cambridge University Press.
- _____ 1975a. "The Hippocratic Question," *CQ* 25.2: 171-92.
- _____ 1975b. "Alcmaeon and the Early History of Dissection," *Sudhoffs Archiv* 59.2: 113-47.
- _____ 1970. *Early Greek Science: Thales to Aristotle*. Chatto and Windus.
- _____ 1966. *Polarity and Analogy: Two Types of Argumentation in Early Greek Thought*. Cambridge University Press.
- _____ 1964. "The Hot and the Cold, the Dry and the Wet in Greek Philosophy," *JHS* 84: 92-106.
- Lloyd-Jones, H. 1996. *Sophocles: Fragments*. Harvard University Press (The Loeb Classical Library).
- Lo Presti, R. 2012. "Shaping the Difference: Medical Inquiry into the Nature of Places and the Early birth of Anthropology in the Hippocratic Treatise *Airs Waters Places*," in P.A. Baker, H. Nijdam, and K. van 't Land (eds.), *Medicine and Space: Body, Surroundings and Borders in Antiquity and the Middle Ages*. Brill. 169-95.
- Lock, M.M. 1997. "Decentering the Natural Body: Making Difference Matter," *Configurations* 5.2: 267-92.
- _____ 1993. "Cultivating the Body: Anthropology and Epistemologies of Bodily Practice and Knowledge," *Annual Review of Anthropology* 22: 133-55.
- Logan, M.H. 1973. "Humoral Medicine in Guatemala and Peasant Acceptance of Modern Medicine," *Human Organization* 32.4: 385-96.
- Long, A.A. 1968. *Language and Thought in Sophocles: A Study of Abstract Nouns and Poetic Techniques*. The Athlone Press.
- Longrigg, J. 2000. "Death and Epidemic Disease in Athens," in V.M. Hope and E. Marshall (eds.), *Death and Disease in the Ancient City*. Routledge. 55-64.
- _____ 1993. *Greek Rational Medicine: Philosophy and Medicine from Alcmaeon to the Alexandrians*. Routledge.
- _____ 1988. "Anatomy in Alexandria in the Third Century B.C.," *BJHS* 21.4: 455-88
- _____ 1980. "The Great Plague of Athens," *History of Science* 18: 209-225.

Lonie, I.M. 1983. "Literacy and the Development of Hippocratic Medicine," in F. Lasserre and P. Mudry (eds.), *Formes de pensée dans la collection Hippocratique*. Droz. 145-61.

_____ 1981. *The Hippocratic Treatises On Generation, On the Nature of the Child, Diseases IV*. de Gruyter.

_____ 1978. "Cos versus Cnidus and the Historians: Part 1," *History of Science* 16: 42-75.

_____ 1965. "The Hippocratic Treatise *Peri diaites oxeon*." *Sudhoffs Archiv für Geschichte der Medizin und der Naturwissenschaften* 49.1: 50-79.

Lopez-Ferez, J.A. 2006. "Algunos Euphemismos, Indicadores de la Relacion Sexual, en el Corpus Hippocraticum," in E. Calderon, A. Morales, and M. Valverde (eds.), *Koinos Logos: Honenaje al profesor Jose Garcia Lopez*. University of Murcia. 507-517.

_____ 1999. "Eufemismos y vocabulario tecnico en el Corpus Hippocraticum. (Estudio de algunos terminos escatologicos y anatomicos)," in F. de Martino and A.H. Sommerstein (eds.), *Studi sull' eufemismo*. Bari. 219-257.

Lowe, N.J. 2008. *Comedy. Greece & Rome New Surveys in the Classics*, No. 37. Cambridge University Press.

Ludwig, P.W. 1996. "Politics and Eros in Aristophanes' Speech: *Symposium* 191e-192a and the Comedies," *AJPhil*. 117.4: 537-62.

MacDowell, D.M. 1995. *Aristophanes and Athens: An Introduction to the Plays*. Oxford University Press.

_____ 1971. *Aristophanes: Wasps*. Clarendon Press.

Macleod, M.D. 2008. *Xenophon: Apology and Memorabilia I*. Aris & Phillips.

Madea, B. 2013. "Cadaveric Spasm," *Forensic Science, Medicine, and Pathology* 9: 249-50.

Majno, G. 1975. *The Healing Hand: Man and Wound in the Ancient World*. Harvard University Press.

Malomo, A.O., O.E. Idowu, and F.C. Osuagwu. 2006. "Lessons from History: Human Anatomy, from the Origin to the Renaissance," *International Journal of Morphology* 24.1: 99-104.

Manetti, D. 1999. "The Role of Doxography in the *Anonymus Londiniensis*," in P.J. van der Eijk (ed.), *Ancient Histories of Medicine: Essays in Medical Doxography and Historiography in Classical Antiquity*. Brill. 95-141.

Manetti, D. and A. Roselli 1982. *Ippocrate, Epidemie (Libro Sesto)*. La Nuova Italia.

Mangidis, T. 2003. *Antiphanes' Mythentravestien*. Peter Lang.

- Mann, J.E. 2012. *Hippocrates: On the Art of Medicine*. Brill.
- Männlein-Robert, I. 2005. "Zur literarischen Inszenierung eines Philosophiekonzeptes in den pseudoplatonischen *Anterastai*," in K. Döring, M. Erler, and S. Schorn (eds.), *Pseudoplatonica*. Franz Steiner Verlag. 119-133.
- Mansfield, J. 1980. "Plato and the Method of Hippocrates," *GRBS* 21 4: 341-62.
- _____ 1979. "The Chronology of Anaxagoras' Athenian Period and the Date of His Trial," *Mnemos.* 32.2: 39-69.
- Marg, W. 1976. "Kampf und Tod in der *Ilias*," *WJA* 2: 7-19.
- Marincola, J. 2001. *Greek Historians*. Cambridge University Press.
- Marrou, H.I. 1964. *A History of Education in Antiquity*. The New American Library.
- Marx, W. 1977. *Introduction to Aristotle's Theory of Being as Being*. Springer.
- Mastronarde, D.J. 1994. *Euripides: Phoenissae*. Cambridge University Press.
- McClelland Foster, G. 1994. *Hippocrates' Latin American Legacy: Humoral Medicine in the New World*. Taylor & Francis.
- McCoskey, D.E. 2012. *Race: Antiquity and its Legacy*. I.B. Tauris.
- McFadyean, J. 1922. *The Anatomy of the Horse: A Dissection Guide* (3rd ed.). W. & A.K. Johnston.
- McGowan, F.G. 1935. "Penetrating Wounds of the Abdomen," *Annals of Surgery* 102.3: 395-411.
- Métraux, G.P.R. 1996. *Sculptors and Physicians in Fifth-Century Greece: A Preliminary Study*. McGill-Queen's University Press.
- Miller, F.D. 2009. "The Platonic Soul," in H.H. Benson (ed.), *A Companion to Plato*. Blackwell. 278-93.
- Miller, G.L. 1990. "Literacy and the Hippocratic Art: Reading, Writing, and Epistemology in Ancient Greek Medicine," *Journal of the History of Medicine and Allied Sciences* 45.1: 11-40.
- Miller, H.W. 1962. "The Aetiology of Disease in Plato's *Timaeus*," *TAPA* 93: 175-87.
- _____ 1949. "Philosophy and Medicine in Ancient Greece," *CJ* 44.5: 309-18.
- _____ 1945. "Aristophanes and Medical Language," *TAPA* 76: 74-84.

- _____. 1944. "Medical Terminology in Tragedy," *TAPA* 75: 156-167.
- Miller, J. 1977. "Delaware Anatomy: With Linguistic, Social, and Medical Aspects," *Anthropological Linguistics* 19.4: 144-66.
- Mitchell-Boyask, R. 2008. *Plague and the Athenian Imagination: Drama, History, and the Cult of Asclepius*. Cambridge University Press.
- Moes, M. 2001. "Plato's Conception of the Relations Between Moral Philosophy and Medicine," *Perspectives in Biology and Medicine* 44.3: 353-67.
- Mol, A. 2002. *The Body Multiple: Ontology in Medical Practice*. Duke University Press.
- Montserrat, D. (ed.). 1998. *Changing Bodies, Changing Meanings: Studies on the Human Body in Antiquity*. Routledge.
- Moravcsik, J. 2000. "Health, Healing, and Plato's Ethics," *The Journal of Value Inquiry* 34: 7-26.
- Morelli, E. 2007. "An Epic Expert of Hand Neurosurgery: Homer," *British Association of Plastic, Reconstructive and Aesthetic Surgeons* 60.11: 1272.
- Morgan, T.J. 1999. "Literate Education in Classical Athens," *CQ* 49.1: 46-61.
- Morin, B. 2003. "L'épopée homérique au service du personnage tragique: Polyphème, Héphaïstos et Philoctète à Lemnos," *Rev. Ét. Grec.* 116: 386-417.
- Mueller, M. 1984. *The Iliad*. G. Allen and Unwin.
- Mugler, C. 1963. *Les origines de la science grecque chez Homère: L'homme et l'univers physique*. Klincksieck.
- Mulroy, D.D. 2007. "The Subtle Artistry of the *Minos* and *Hipparchus*," *TAPA* 137.1: 115-31.
- Murray, G. 1920. *The Thesmophoriazusae of Aristophanes*. G. Bell and Sons.
- Mylonas, A.I., F.H. Tzerbos, A.C. Eftychiadis, and E.C. Papadopoulou 2008. "Cranio-maxillofacial Injuries in Homer's *Iliad*," *Journal of Cranio-maxillo-facial Surgery* 36.1: 1-7.
- Naddaf, G. 1998. "Translator's Introduction," in L. Brisson, *Plato the Myth Maker*. The University of Chicago Press. vii-lii.
- Nails, D. 2009. "The Life of Plato of Athens," in H.H. Benson (ed.), *A Companion to Plato*. Blackwell. 1-12.
- Natali, C. 2013. *Aristotle: His Life and School*. Princeton University Press.

- Neer, R. 2010. *The Emergence of the Classical Style in Greek Sculpture*. The University of Chicago Press.
- Nooter, S. 2012. *When Heroes Sing: Sophocles and the Shifting Soundscape of Tragedy*. Cambridge University Press.
- Norri, J. 1998. *Names of Body-parts in English: 1400-1550*. Academia Scientiarum Fennica.
- Nussbaum, M. C. 1994. *The Therapy of Desire: Theory and Practice in Hellenistic Ethics*. Princeton University Press.
- Nutton, V. 2004. *Ancient Medicine*. Routledge.
- Ober, J. 2009. *Mass and Elite in Democratic Athens: Rhetoric, Ideology, and the Power of the People*. Princeton University Press.
- O'Brien, J.V. 1978. *Guide to Sophocles' Antigone*. Southern Illinois University Press.
- Olson, S.D. 2007. *Broken Laughter: Select Fragments of Greek Comedy*. Oxford University Press.
- _____ 1998. *Aristophanes: Peace*. Oxford University Press.
- Onians, R.B. 1951. *The Origins of European Thought: About the Body, the Mind, the Soul, the World, Time and Fate*. Cambridge University Press.
- Osborne, R. 2011. *The History Written on the Classical Greek Body*. Cambridge University Press.
- Oswald, A. 2011. *Memorial*. Faber and Faber.
- Owen, G.E.L. 1953. "The Place of the *Timaeus* in Plato's Dialogues," *CQ* 3.1/2: 79-95.
- Padel, R. 1992. *In and Out of the Mind: Greek Images of the Tragic Self*. Princeton University Press.
- Page, D.L. 1957. *Aeschylus: Agamemnon*. Clarendon Press.
- _____ 1953. "Thucydides' Description of the Great Plague at Athens," *CQ* 3: 97-119.
- Palmer, G.H. 1894. *The Odyssey of Homer*. Houghton Mifflin and Co.
- Palmer, L.R. 1980. *The Greek Language*. Faber and Faber.

- Papagrigorakis, M.J., C. Yapijakis, and P. N. Synodinos. 2008. "Typhoid Fever Epidemic in Ancient Athens," in D. Raoult and M. Drancourt (eds.), *Paleomicrobiology: Past Human Infections*. Springer. 161-73.
- Parry, A. 1969. "The Language of Thucydides' Description of the Plague," *BICS* 16.1: 106-18.
- Patsioti, J.G. and F.C. Rose. 1995. "What Did the Greeks Mean?," *Journal of the History of the Neurosciences: Basic and Clinical Perspectives* 4.1: 67-76.
- Peck, W.H. 1998. "Mummies of Ancient Egypt," in A. Cockburn, E. Cockburn, and T.A. Reyman (eds.), *Mummies, Disease and Ancient Cultures*. Cambridge University Press. 15-37.
- Pelliccia, H 1995. *Mind, Body, and Speech in Homer and Pindar*. Yandenhoeck and Ruprecht.
- Peradotto, J. 1997. "Modern Theoretical Approaches to Homer," in I. Morris and B. Powell, (eds.), *A New Companion to Homer*. Brill. 380-95.
- Persaud, T.V.N. 1984. *Early History of Human Anatomy: From Antiquity to the Beginning of the Modern Era*. Charles C. Thomas.
- Peterson, S. 2011. *Socrates and Philosophy in the Dialogues of Plato*. Cambridge University Press.
- Phillips, A.A. and M.M. Wilcock 1999. *Xenophon & Arrian: On Hunting* (ΚΥΝΗΓΗΤΙΚΟΣ). Aris & Phillips.
- Phillips, E.D. 1973. *Greek Medicine*. Thames and Hudson.
- Phillips, J. 1989. "Xenophon's *Memorabilia* 4.2," *Hermes* 117.3: 366-70.
- Phillips, J.H. 1980. "Early Greek Medicine and the Poetry of Solon," *Clio Medica* 15: 1-4.
- Pickard-Cambridge, A. 1962. *Dithyramb, Tragedy and Comedy* (2nd ed.). Clarendon Press.
- Platnauer, M. 1964. *Aristophanes: Peace*. Clarendon Press.
- Platter, C. 2007. *Aristophanes and the Carnival of Genres*. The John Hopkins University Press.
- Podlecki, A.J. 2005. *Aeschylus: Prometheus Bound*. Aris & Phillips.
- _____. 1977. "Herodotus in Athens?," in K.H. Kinzl (ed.), *Greece and the Eastern Mediterranean*. de Gruyter. 246-65.
- Pomeroy, S. 1977. "Technikai kai Mousikai: The Education of Women in the Fourth Century and in the Hellenistic Period," *AJAH* 2: 51-68.
- Porter, J.L. (ed.). 1999a. *Constructions of the Classical Body*. The University of Michigan Press.

- _____. 1999b. "Introduction," in J. Porter (ed.), *Constructions of the Classical Body*. The University of Michigan Press. 1-18.
- Porter, J.R. 1990. "Tiptoeing Through the Corpses: Euripides' *Electra*, Apollonius, and the *Bouphonia*," *GRBS* 31.3: 255-80.
- Porter, J.I. 2002. "Homer: The Very Idea," *Arion* 10.2: 57-86.
- Potte-Bonneville, M. 2012. "Michel Foucault's Bodies," *Journal of the British Society of Phenomenology* 43.1: 1-32.
- Potter, P. 2010. *Hippocrates, Vol. 9*. Harvard University Press (The Loeb Classical Library).
- _____. 1988. *Hippocrates, Vol. 5*. Harvard University Press (The Loeb Classical Library).
- _____. *Short Handbook of Hippocratic Medicine*. Les Éditions du Sphinx.
- Pownall, F. 2007. "From Orality to Literacy: The Moral Education of the Elite in Fourth-Century Athens," in C. Cooper (ed.), *Politics of Orality*. Brill. 235-49.
- Press, G.A. 2000. *Who Speaks for Plato?: Studies in Platonic Anonymity*. Rowman & Littlefield.
- Prior, W.J. 2009. "The Socratic Problem," in H.H. Benson (ed.), *A Companion to Plato*. Blackwell. 25-35.
- Prioreschi, P. 1996. *A History of Medicine: Greek Medicine*. Horatius Press.
- Psichari, J. 1908. "Sophocle et Hippocrate: À propos de Philoctète à Lemnos," *RPh* 32: 95-108.
- Raaflaub, K.A. 2002. "Philosophy, Science, Politics: Herodotus and the Intellectual Trends of his Time," in E.J. Bakker, I.J.F. de Jong, and H. van Wees (eds.), *Brill's Companion to Herodotus*. Brill. 149-86.
- Radermacher, L. 1896. "Über den *Cynegeticus* des Xenophon," *RPh* 51: 596-629.
- Raeburn, D. and O. Thomas 2011. *The Agamemnon of Aeschylus*. Oxford University Press.
- Rau, P. 1967. *Paratragodia*. C.H. Beck.
- Rechenaur, G. 1991. *Thukydides und die hippokratische Medizin*. Olms.
- Rehm, R. 2002. *The Play of Space: Spatial Transformation in Greek Tragedy*. Princeton University Press.
- Renehan, R. 1992. "The Staunching of Odysseus' Blood: The Healing Power of Magic," *AJPhil*. 113.1: 1-4.

- _____. 1979. "The Meaning of ΣΩΜΑ in Homer: A Study in Methodology," *California Studies in Classical Antiquity* 12: 269-82.
- Revermann, M. 2006. *Comic Business: Theatricality, Dramatic Technique, and Performance Contexts of Aristophanic Comedy*. Oxford University Press.
- Richard, A.G. 2007. *Soldiers' Lives Through History: The Ancient World*. Greenwood Publishing Group.
- Rist, J.M. 1965. "Neopythagoreanism and "Plato's" Second Letter," *Phronesis* 10: 78-81.
- Robertson, N. 1999. "Σπλαγχνόπτης," *ZPE* 127: 175-79.
- Rocca, J. 2008. "Anatomy," in R.J. Hankinson (ed.), *The Cambridge Companion to Galen*. Cambridge University Press. 242-62.
- Rodríguez-Noriega Guillén, L. 2012. "Epicharmus' Literary and Philosophical Background," in K. Boshier (ed.), *Theater Outside Athens: Drama in Greek Sicily and South Italy*. Cambridge University Press. 76-96.
- Roisman, H.M. and C.A.E. Luschnig. 2012. *Euripides' Electra*. University of Oklahoma Press.
- Roochnik, D. 1998. *Of Art and Wisdom: Plato's Understanding of Techne*. Penn State Press.
- Roos, E. 1951. *Die Tragische Orchestik im Zerrbild der altattischen Komödie*. C.W.K. Gleerup.
- Rose, M.L. 2003. *The Staff of Oedipus: Transforming Disability in Ancient Greece*. University of Michigan Press.
- Roselli, A. 1999. "Notes on the *Doxai* of Doctors in Galen's Commentaries on Hippocrates," in P.J. van der Eijk (ed.), *Ancient Histories of Medicine: Essays in Medical Doxography and Historiography in Classical Antiquity*. Brill. 359-82.
- Rosen, S. 1968. *Plato's Symposium*. Yale University Press.
- Ross, D. 2005. *Aristotle*. Routledge.
- Roth, A.D. 2008. *Reciprocal Influences Between Rhetoric and Medicine in Ancient Greece*. (Diss.) University of Iowa.
- Rothwell, K.S. 2007. *Nature, Culture, and the Origins of Greek Comedy*. Cambridge University Press.
- Roura, C. 1972. "Aproximaciones al lenguaje científico de la Colección hipocrática," *Emerita* 40.2: 319-27.

- Rozin, R.R. and Y. Kleinman. 1987. "Surgical Priorities of Abdominal Wounded in a Combat Situation," *The Journal of Trauma* 27.6: 656-60.
- Rubinelli, S. 2009. *Ars Topica: The Classical Technique of Constructing Arguments from Aristotle to Cicero*. Springer.
- Runia, D.T. 1986. *Philo of Alexandria and the Timaeus of Plato*. Brill.
- Russell, D.A. 1981. *Criticism in Antiquity*. University of California Press.
- Rutherford, R.B. 2012. *Greek Tragic Style: Form, Language, and Interpretation*. Cambridge University Press.
- Ruthrof, H. 1997. *Semantics and the Body: Meaning from Frege to Postmodern*. University of Toronto Press.
- Ruttenberg, H.S. 1986. "Plato's Use of the Analogy Between Justice and Health," *The Journal of Value Inquiry* 20: 145-56.
- Sahlas, D.J. 2001. "Functional Neuroanatomy in the Pre-Hippocratic Era: Observations from the *Iliad* of Homer," *Neurosurgery* 48.6: 1352-7.
- Sakai, T. 2007. "Historical Evolution of Anatomical Terminology from Ancient to Modern," *Anatomical Science International* 82: 65-81.
- Salazar, C.F. 2000. *The Treatment of War Wounds in Graeco-Roman Antiquity*. Brill.
- Sallis, J. 1999. *Chorology: On Beginning in Plato's Timaeus*. Indiana University Press.
- Sandford, S. 2010. *Plato and Sex*. Polity Press.
- Santos, G.H. 2000. "Chest Trauma During the Battle of Troy: Ancient Warfare and Chest Trauma," *The Annals of Thoracic Surgery* 69: 1285-87.
- Sapounakis, C., G. Rallis, C. Mourouzis, E. Konsolaki, and C. Tesseromatis 2007. "Injuries to the Head and Neck in Homer's *Iliad*," *The British Journal of Maxillo and Facial Surgery* 45.2: 112-15.
- Saunders, B. 2008. "(Review) *Shakespeare's Entrails: Belief, Scepticism and the Interior of the Body*," *Shakespeare Quarterly* 59.1: 98-101.
- Saunders, K.B. 2004. "Frölich's Table of Homeric Wounds," *CQ* 54.1: 1-17.
- _____ 2000. "A Note on the Strange Death of Mydon in *Iliad* 5," *Symb. Osl.* 75: 24-33.
- _____ 1999. "The Wounds in *Iliad* 13-16," *CQ* 49: 345-63.

- Sawday, J. 1995. *The Body Emblazoned: Dissection and the Human Body in Renaissance Culture*. Routledge.
- Scarborough, J. 1992. *Medical Terminologies: Classical Origins*. University of Oklahoma Press.
- _____ 1984. *The Mortal Hero: An Introduction to Homer's Iliad*. University of California Press.
- Schein, S.L. 2013. *Sophocles: Philoctetes*. Cambridge University Press.
- Schiefsky, M.J. 2005a. *Hippocrates: On Ancient Medicine*. Brill.
- _____ 2005b. "On Ancient Medicine on the Nature of Human Beings," in P.J. van der Eijk (ed.), *Hippocrates in Context*. Brill. 69-85.
- Schironi, F. 2010. "Technical Languages: Science and Medicine," in E.J. Bakker (ed.), *A Companion to the Ancient Greek Language*. Wiley-Blackwell. 338-53.
- Schöner, E. 1964. *Das Viereschema in der antiken Humoralpathologie*. W.F. Steiner.
- Sedley, D. 1998. "Platonic Causes," *Phronesis* 43.2: 114-32.
- Segal, C.P. 1985. "Tragedy, Corporeality, and the Texture of Language: Matricide in the Three Electra Plays," *CW* 79.1: 7-23.
- _____ 1971. *The Theme of the Mutilation of the Corpse in the Iliad*. Brill.
- Shanks, D. 2002. "Muscularity and the Western Medical Tradition," *Hirundo* 2: 58-81.
- Shelley, P.B. 1840. *Essays, Letters from Abroad, Translations, and Fragments*. Edward Moxon.
- Shilling, C. 2003. *The Body and Social Theory*. Sage.
- Sigerist, H.E. 1961. *A History of Medicine, Vol. 2: Early Greek, Hindu, and Persian Medicine*. Oxford University Press.
- _____ 1951. *A History of Medicine, Vol. 1: Primitive and Archaic Medicine*. Oxford University Press.
- Silk, M.S. 1990. "Aristophanic Paratragedy," in A.H. Sommerstein, S. Halliwell, J. Henderson, and B. Zimmermann (eds.), *Tragedy, Comedy and the Polis*. Levante Editori. 477-504.
- Singer, C. 1959. "The Strange Histories of Some Anatomical Terms," *Medical History* 3.1: 1-7.
- _____ 1956. *Galen: On Anatomical Procedures*. Oxford University Press.
- Skemp, J.B. 1976. *Plato: New Surveys*. Clarendon Press.

- Skinner, H.A. 1961. *The Origin of Medical Terms*. Williams and Wilkins.
- Skinner, J.E. 2012. *The Invention of Greek Ethnography: From Homer to Herodotus*. Oxford University Press.
- Skoda, F. 1988. *Médecine ancienne et métaphore: Le vocabulaire de l'anatomie et de la pathologie en grec ancien*. Peeters/Selaf.
- Slater, N.W. 2002. *Spectator Politics: Metatheatre and Performance in Aristophanes*. University of Pennsylvania Press.
- Smith, W.D. 1979. *The Hippocratic Tradition* (electronic ed., rev. 2002). Cornell University Press.
- _____ 1967. "Diseases in Euripides' *Orestes*," *Hermes* 95.3: 291-307.
- _____ 1966. "Physiology in the Homeric Poems," *TAPA* 97: 547-556.
- Snell, B. 1977. "φρένες - φρόνησις," *Glotta* 55.1/2: 34-64.
- _____ 1971. *Tragicorum Graecorum fragmenta, Vol. 1*. Vandenhoeck & Ruprecht.
- _____ 1953. *The Discovery of the Mind The Greek Origins of European Thought*. Harvard University Press.
- Soleil, D. 2010. "Les mots d'Aristophane et les mots d'Hippocrate: Encore une fois sur le vocabulaire médical d'Aristophane," *Lucida Intervalla* 40: 25-42.
- Solmsen, F. 1963. "Nature as Craftsman in Greek Thought," *Journal of the History of Ideas* 24.4: 473-96.
- Sommerstein, A.H. 2010. *Aeschylean Tragedy*. Duckworth.
- _____ 1998. *Aristophanes: Ecclesiazusae*. Aris & Phillips.
- _____ 1998. "Monsters, Ogres and Demons in Old Comedy," in C. Atherton (ed.), *Monsters and Monstrosity in Greek and Roman Culture*. Levante Editori. 19-40.
- _____ 1985. *Aristophanes: Peace*. Bolchazy-Carducci.
- _____ 1983. *Aristophanes: Wasps*. Aris & Phillips.
- _____ 1982. *Aristophanes: Clouds*. Aris & Phillips.
- Southard, G.C. 1971. *The Medical Language of Aristophanes*. (Diss.) University of Michigan.

- Sprague, R.K. 1976. *Plato's Philosopher King: A Study of the Theoretical Background*. University of South Carolina Press.
- Staley, G.A. 1985. "The Literary Ancestry of Sophocles' Ode to Man," *CW* 78.6: 561-70.
- Stalley, R.F. 1996. "Punishment and the Physiology of the *Timaeus*," *CQ* 46: 357-70.
- _____ 1981. "Mental Health and Individual Responsibility in Plato's *Republic*," *The Journal of Value Inquiry* 15: 109-24.
- Stanford, W.B. 1942. *Aeschylus in His Style: A Study in Language and Personality*. Blackwell.
- Starkie, W.J.M. 1968. *The Wasps of Aristophanes*. Adolf M. Hakkert.
- _____ 1909. *The Acharnians of Aristophanes*. Macmillan and Co.
- Steckerl, F. 1945. "Plato, Hippocrates, and the Menon Papyrus," *C Phil.* 40.3: 166-80.
- Stehle, E.M. 2006. "Solon's Self-reflexive Political Persona and its Audience," in J.H. Blok and A.P.M.H. Lardinois (eds.), *Solon of Athens: New Historical and Philological Approaches*. Brill. 79-113.
- _____ 2002. "The Body and its Representations in Aristophanes' *Thesmophoriazousai*: Where Does the Costume End?," *AJPhil.* 123.3: 369-406.
- Stewart, A. 1997. *Art, Desire, and the Body in Ancient Greece*. Cambridge University Press.
- Stone, L.M. 1981. *Costume in Aristophanic Comedy*. Ayer.
- Storey, I.C. 2011. *Fragments of Old Comedy, Vol. 3*. Harvard University Press (The Loeb Classical Library).
- Storey, I.C. and A. Allan 2008. *A Guide to Ancient Greek Drama*. John Wiley & Sons.
- Strauss, L. 1996. *Socrates and Aristophanes*. University of Chicago Press.
- Sugar, O. 1987. "How the Sacrum Got its Name," *Journal of the American Medical Association* 257.15: 2061-63.
- Sullivan, S. 1995. *Psychological and Ethical Ideals: What Early Greeks Say*. Brill.
- _____ 1994. "'Self' and Psychic Entities in Early Greek Epic," *Eos* 82: 5-16.
- _____ 1988. *Psychological Activity in Homer*. Carleton University Press.
- Sutton, D.F. 1983. "The Date of *Prometheus Bound*," *GRBS* 24: 289-94.

- Swift Riginos, A. 1976. *Platonica*. Brill.
- Taylor, A.E. 1928. *A Commentary on Plato's Timaeus*. Clarendon Press.
- _____ 1926. *Plato: The Man and his Works*. Methuen and Co.
- Temkin, O. 1963. "Greek Medicine as Science and Craft," *Isis* 33: 213-25.
- Terrase, S. 2001. "Pathologie et bestialité: Une représentation métaphorique de la maladie dans les tragédies de Sophocle," *Anthropozoologica* 33-34: 47-59.
- Thivel, A. 2004. "Eryximaque et le principe des contraires," *Cuadernos de filología clásica* 14: 35-44.
- Thomas, R. 2006. "Thucydides' Intellectual Milieu and the Plague," in A. Rengakos and A. Tsakmis (eds.), *Brill's Companion to Thucydides*. Brill. 87-108.
- _____ 2004. "Greek Medicine and Babylonian Wisdom: Circulation of Knowledge and Channels of Transmission in the Archaic and Classical Periods," in H.F.J. Horstmanshoff and M. Stol (eds.), *Magic and Rationality in Ancient Near Eastern and Graeco-Roman Medicine*. Brill. 175-185.
- _____ 1998. "Ethnography, Proof, and Argument in Herodotus' Histories," *Proceedings of the Cambridge Philological Society* 43: 128-48.
- Thompson, A.P.D. 1966. "Medicine and Herodotus," *Central African Journal of Medicine* 12 (Supp.): 13-24.
- Todd, S.C. 2000. *Lysias*. University of Texas Press.
- Totelin, L.M.V. 2008. *Hippocratic Recipes: Oral and Written Transmission of Pharmacological Knowledge in Fifth- and Fourth-Century Greece*. Brill.
- Tracy, T.J. 1969. *Physiological Theory and the Doctrine of the Mean in Plato and Aristotle*. Loyola University Press.
- Tredennick, H. 1960. *Aristotle: Posterior Analytics, Topica*. Harvard University Press (The Loeb Classical Library).
- Tsekourakis, D. 1993. "Plato's *Phaedrus* and the Holistic Viewpoint in Hippocrates' Therapeutics," *BICS* 38.1: 162-73.
- Tsiafakis, D. 2003. "ΠΕΛΩΠΑ: Fabulous Creatures and/or Demons of Death," in J.M. Padgett (ed.), *The Centaur's Smile: The Human Animal in Early Greek Art*. Yale University Press. 73-104.

- Tuplin, C. 2004. "Doctoring the Persians: Ctesias of Cnidus, Physician and Historian." *Klio* 86.2: 305-47.
- Turan, H. 2013. "Cosmos, the Meaningful Construct," in A.-T. Tymieniecka (ed.), *Phenomenology and the Human Positioning in the Cosmos: The Life-world, Nature, Earth: Book One*. Analecta Husserliana. 9-19.
- Ugent, D. 2000. "Medicine, Myths and Magic: The Folk Healers of a Mexican Market," *Economic Botany*, 54.4: 427-38.
- Urso, C. 1997. "Anatomical References in Homer's *Iliad*," *Patologica* 89.1: 26-30.
- Usselman, J.A. 1966. "Liver Scanning in the Assessment of Liver Damage from Therapeutic External Irradiation," *Journal of Nuclear Medicine* 7: 761-72.
- Valakas, K. 2002. "The Use of the Body by Actors in Tragedy and Satyr-Play," in P. Easterling and E. Hall (eds.), *Greek and Roman Actors: Aspects of an Ancient Profession*. Cambridge University Press. 69-92.
- Van Brock, N. 1961. *Recherches sur le vocabulaire médical du grec ancien: Soins et guérison*. Klincksieck.
- Van der Eijk, P.J. 2005. *Medicine and Philosophy in Classical Antiquity: Doctors and Philosophers on Nature, Soul, Health and Disease*. Cambridge University Press.
- _____. 2000. *Diocles of Carystus, Vol. 2: Commentary*. Brill.
- _____. 1990. "The 'Theology' of the Hippocratic Treatise *On the Sacred Disease*," *Apeiron* 23: 87-119.
- Van der Eijk, P.J. and S.R. Francis 2009. "Aristoteles, Aristotelismus und antike Medizin," in C. Brockmann, C. Wolfram Brunschön, and O. Overwien (eds.), *Antike Medizin im Schnittpunkt von Geistes- und Naturwissenschaften*. de Gruyter. 213-234.
- Van Gennep, A. 1960. *The Rites of Passage*. Tr. M.B. Vizedom and G.L. Caffee. Routledge.
- Van Straten, F. 2006. "Ancient Greek Animal Sacrifice: Gift, Ritual Slaughter, Communion, Food Supply or What? Some Thoughts on Simple Explanations of a Complex Ritual," in S. Georgoudi, R. Kotch Piettre, and F. Schmidt (eds.), *La cuisine et l'autel: Les sacrifices en questions dans les sociétés de la Méditerranée ancienne*. Brepolis. 15-29.
- _____. 1995. *Hiera Kala: Images of Animal Sacrifice in Archaic and Classical Greece*. Brill.
- Varakis, A. 2010. "Body and Mask in Aristophanic Performance," *BICS* 53.1: 17-38.
- Verdenius, W.J. 1982. "Another Note on Plato, *Phaedrus* 270 AC," *Mnemos*. 35.3/4: 333-35.

- Vlastos, G. 1995. *Studies in Greek Philosophy: Socrates, Plato, and Their Tradition, Vol. 2*. Princeton University Press.
- Vom Lehn, D. 2006. "The Body as Interactive Display: Examining Bodies in a Public Exhibition," *Sociology of Health & Illness* 28.2: 223-51.
- Von Möllendorf, P. 2009. "Man as Monster: Eros and Hubris in Plato's *Symposium*," in T. Fögen and M.M. Lee (eds.), *Bodies and Boundaries in Graeco-Roman Antiquity*. de Gruyter. 87-109.
- Von Staden, H. 1992. "The Mind and Skin of Heracles: Heroic Diseases," in D. Grourevitch (ed.), *Maladie et maladies: Histoire et conceptualisation. Melanges en l'honneur de Mirko Grmek*. Champion. 131-50.
- _____ 1989. *Herophilus: The Art of Medicine in Early Alexandria*. Cambridge University Press.
- _____ 1976. "A New Testimonium about Polybus," *Hermes* 104: 494-496.
- Walker, J.H. 1996. *Studies in Ancient Egyptian Anatomical Terminology*. Aris & Phillips.
- Wallis Budge, E.A. 2011. *The Mummy: A Handbook of Egyptian Funerary Archaeology*. Cosimo, Inc.
- Walshe, T.M. 1997. "Neurological Concepts in Archaic Greece: What did Homer Know?," *Journal of the History of the Neurosciences* 6.1: 72-81.
- Weidauer, K. 1954. *Thukydides und die Hippokratischen Schriften: Der Einfluss der Medizin auf Zielsetzung und Darstellungsweise des Geschichtswerks*. Carl Winter.
- West, M.L. 1999. "The Invention of Homer," *CQ* 49.2: 364-82.
- _____ 1990. *Studies in Aeschylus*. de Gruyter.
- _____ 1978. *Works & Days*. Clarendon Press.
- White, J.W. 1880. *Stein's Summary of the Dialect of Herodotus*. Ginn and Heath.
- Whitman, C.H. 1964. *Aristophanes and the Tragic Hero*. Harvard University Press.
- Widdra, K. 1964. *Xenophontis de re Equestri*. Teubner.
- Wilk, S.R. 2000. *Medusa: Solving the Mystery of the Gorgon*. Oxford University Press.
- Willi, A. 2003. *The Languages of Aristophanes: Aspects of Linguistic Variation in Classical Attic Greek*. Oxford University Press.
- Williams, B. 1993. *Shame and Necessity*. University of California Press.

- Winkler, J. 1990. "Phallos Politikos: Representing the Body Politic in Athens," *Differences* 2: 24-45.
- Winton, R.I. 1992. "Athens and the Plague: Beauty and the Beast," *Metis* 7.1-2: 201-8.
- Withington, E.T. 1927. *Hippocrates, Vol. 3*. G.P. Putnam's Sons (Loeb Classical Library).
- Wolff, R.J. 1965. "Modern Medicine and Traditional Culture: Confrontation on the Malay Peninsula," *The Society for Applied Anthropology*, 24.4: 339-345.
- Wood, S. 1931. "Homer's Surgeons: Machaon and Podalirius," *The Lancet* 217.5617: 947-48.
- Worman, N. 2012. "Cutting to the Bone: Recalcitrant Bodies in Sophocles," in K. Ormand (ed.), *A Companion to Sophocles*. John Wiley & Sons. 351-66.
- _____. 2000. "Infection in the Sentence: The Discourse of Disease in Sophocles' *Philoctetes*," *Arethusa* 33.1: 1-36.
- Wyatt, W.F. 1988. "Homeric Language," *CW* 82.1: 27-29.
- Wylie, J.A.H. and H.W. Stubbs. 1983. "The Plague of Athens: 430-428 B.C. Epidemic and Epizootic," *CQ* 33.1: 6-11.
- Xie, Z.-F. 2001. "Harmonization of Traditional and Modern Medicine," in R.R. Chaudhury and U.M. Fafei (eds.), *Traditional Medicine in Asia*. World Health Organization. 115-34.
- Zacharia, K. 2003. *Converging Truths: Euripides' Ion and the Athenian Quest for Self-Definition*. Brill.
- Zeitlin, F. 1996. *Playing the Other: Gender and Society in Classical Greek Literature*. University of Chicago Press.
- _____. 1991. "Euripides' *Hekabe* and the Somatics of Dionysiac Drama," *Ramus* 20: 53-94.
- Zeyl, D.J. 2000. *Timeaus*. Hackett.
- _____. (tr.). 1997. "Timaeus," in J.M. Cooper (ed.), *Plato: Complete Works*. Hackett Publishing Company. 1224-91.

Appendix 1: Anatomical term glossary

The following list of anatomical terms comprises the core data used in the preparation of this project. Citations to specific authors and works are intended to illustrate the distribution of a word's use in different genres during the Archaic and Classical periods. When selecting examples, I have concentrated on major authors and works discussed in this dissertation, and I have included references to them whenever possible. Translations generally follow those provided in the LSJ, except when a translation either is out of date or is otherwise potentially unclear. Bold numbers following entries refer to page numbers of passages or discussions.

ep. = epic; **lyr.** = lyric/elegiac; **dr.** = drama; **pr.** = prose

A

ἄγκών: *bend in the arm / elbow*, **ep.** *Il.* 10.80, *Od.* 14.494; **lyr.** Sapph. fr. 99 col. 12, Pi. *O.* 2.83; **dr.** *S. Ant.* 1237, *E. IA* 131; **pr.** *Hdt.* 2.99, *Xen. Cyr.* 6.1.29, *Pl. Phdr.* 257d9, *Hp. Art.* 10, *Morb.* 3.14. **109.**

(ἀγκάλη) **lyr.** Archil. fr. S478a45; **dr.** *A. Ch.* 587, *E. Alc.* 351, *Ar. Ra.* 704; **pr.** *Hdt.* 6.61, *Xen. Cyr.* 5.50, *Pl. Lg.* 790d7.

ἀγοστός: *flat of the hand*, **ep.** *Il.* 11.425 (= ἀγκάλη at Theoc. 17.129). **34.**

ἀδήν: *gland*, **pr.** *Hp. Art.* 11, *Gland.* 1. **100-1.**

αἰδοῖα: *genitals*, **ep.** *Il.* 13.568, *Hes. Op.* 733; **dr.** *A. Supp.* 491, *S. fr.* 1078 Radt, *E. HF* 301, *Ar. Nu.* 978; **pr.** *Hdt.* 1.108, *Th.* 2.49.8, *Xen. An.* 4.3.12, *Pl. Phdr.* 254a2, *Hp. Aër.* 9, *Aph.* 3.21, *Aër.* 9. **60-61, 105, 158, 239.**

ἄκανθα: *backbone / spine* (lit. *thorn*, e.g. *Od.* 5.328), **dr.** *E. El.* 492, *Ar. V.* 969 (of a fish); **pr.** *Hdt.* 4.72, *Hp. Art.* 14, *Mochl.* 1. **140, 179.**

ἄκνηστις: *backbone / spine* **ep.** *Od.* 10.61 (or κατὰ κνήστις). **33 n. 40.**

ἄκρωτήρια: *bodily extremities* (adj. *extreme points*, e.g. *Hdt.* 7.217 [of a mountain peak]), **pr.** *Th.* 2.49, *Lys. In And.* 26, *Hp. Prorrh.* 2.6, *Flat.* 8, *Aph.* 7.1. **239.**

ἀνθερών: *chin*, **ep.** *Il.* 5.293; **pr.** *Hp. Epid.* 5.60, *Oss.* 18.

ἀντιάς: *tonsil*, **pr.** *Morb.* 2.11.

ἄορτή: *bronchial tube*, **pr.** *Hp. Coac.* 394, *Loc. Hom.* 14; cf. *Arist. HA* 496a7 and [*Hp.*] *Cord.* 10 (*artery to the heart*). **101.**

ἄορτρον: *lobe of lungs*, **pr.** *Hp. Morb.* 2.54; cf. *Gal. Ling. Hp.* 19.82 K = τὸ ἀπηρητημένον τοῦ πνεύμονος μέρος ἐκατέρωθεν. **101 n. 136.**

ἄρθρον: *joint*, **dr.** *A. fr.* 17 Radt, *S. OT* 1032, *E. HF* 1395, *Ar. V.* 1494; **pr.** *Hdt.* 3.87, *Xen. Cyn.* 4.1, *Pl. Phdr.* 265e1, *Hp. Loc. Hom.* 6, *Epid.* 1.2.4. **101, 211.**

διάρθρωσις: *joint*, **pr.** *Hp. Nat. Puer.* 18.

ἄρτηρία: *channel*, **dr.** *S. Tr.* 1054 (of the lungs, prob. *bronchus*), [*E.*] *Rh.* 785 (*nostrils*); **pr.** *Pl. Ti.* 78c5 (of the lungs), *Hp. Morb.* 1.22 (of the lungs), *Epid.* 7.25 (*windpipe*), *Carn.* 5 (*vessel*), *Art.* 45 (*vessel*); cf. *Arist. HA* 495a20 (*windpipe*). **177-79.**

ἄρχος: (lit. ruler, e.g. *Il.* 1.144), *rectum*, **pr.** *Hp. Aph.* 5.58, *Arist. HA* 507a33; *anus*, **pr.** *Hp. Haem.* 2, *Epid.* 5.20.

ἀστράγαλος: *vertebra*, **ep.** *Il.* 14.466, *Od.* 11.65; *ball of the ankle joint*, **lyr.** *Anacr.* fr. 43; **pr.** *Hdt.* 3.129, *Xen. Eq.* 1, *Hp. Epid.* 5.48; *knuckle bones* (especially animal bones used as dice), **ep.** *Il.* 23.88; **dr.** *Ar. V.* 295; **pr.** *Pl. Lys.* 206e5. **48, 109.**

ἀσφάραγος: *throat / gullet*, **ep.** *Il.* 22.328.

αὐλός: *channel* (lit. *pipe / flute*, e.g. *Il.* 10.13), **ep.** *Od.* 22.18 (nostril). **173 n. 117.**

αὐλήν: *neck, throat*, **ep.** *Il.* 7.12, *Od.* 10.559, *Hes. Op.* 815; **lyr.** *Stesich.* fr. S15, col. 12.14; **dr.** *A. Per.* 191, *S. Ant.* 1221, *E. Hec.* 376, *Ar. Lys.* 681; **pr.** *Hdt.* 4.188, *Pl. Ti.* 69e2, *Hp. Prog.* 23, *Art.* 5, *Nat. Hom.* 11; cf. *Mul.* 230 = neck of the uterus, *Art.* 51 = neck of the thigh bone. **46, 48, 59, 74, 172 n. 110.**

B

βαθμῖς: *socket* (lit. *base*, e.g. *Pi. N.* 5.1), **pr.** *Hp. Fract.* 2; cf. *Gal. UP* 3.143 K.

βάλανος: *glans penis* (lit. *acorn*, e.g. *Od.* 10.242), **dr.** *Ar. Lys* 410; cf. *Arist. HA* 493a27.

βάσις: *foot* (lit. *step*, e.g. *A. Eu.* 36), **pr.** *Pl. Ti.* 92a3; cf. *Arist. GA* 750a4.

βλέφαρον: *eyelid*, **ep.** *Il.* 17.438, *Od.* 5.493, *Hes. Th.* 910; **lyr.** *B.* 5.157; **dr.** *A. Ag.* 15, *S. Ant.* 104, *E. Or.* 158, *Ar. V.* 12; **pr.** *Xen. Cyn.* 5.11, *Pl. Ti.* 45d8, *Hp. VM* 19, *Epid.* 7.5.

βουβών: *groin*, **ep.** *Il.* 4.492; **pr.** *Hp. Epid.* 1.3.13, *Art.* 41; *gland*, **pr.** *Hp. Epid.* 2.2.24; cf. *Ar. Ra.* 1280: τῶ νεφρῶ βουβωνίῳ = *testicles*. **100, 189 n. 7.**

βραχίων: *upper arm*, **ep.** *Il.* 13.529, *Od.* 18.69; **dr.** *A. Supp.* 747, *S. Tr.* 1090, *E. HF* 312, *Ar. Ec.* 267; **pr.** *Hdt.* 1.74, *Xen. Eq.* 7.8 (of a horse), *Pl. Ti.* 75a1, *Hp. Aër.* 17, *Epid.* 5.92. **45, 159.**

βρέγμα: *front part of the forehead*, **ep.** *Il.* 5.586 (βρέγμα), *Batr.* 228; **dr.** *A.* fr. 451h Radt, *Stratt.* fr. 35 K.-A.; **pr.** *Hp. Epid.* 5.50, *VC* 2; cf. *Arist. HA* 491a31. **26 n. 10.**

βρογχία: *bronchial tubes*, **pr.** *Hp. Carn.* 16; cf. [*Hp.*] *Anat.* 1 = a system of ducts connecting heart with liver. **101.**

βρόγχος: *trachea, windpipe*, **pr.** *Hp. Loc. Hom.* 6, *Epid.* 7.28, *Aph.* 6.37; cf. [*Arist.*] *Pr.* 900a13. **101.**

Γ

γαργαρεών: *uvula*, **pr.** *Hp. Morb.* 2.10, *Epid.* 2.2.24; cf. *Arist. HA* 492b11.

γαστήρ: *paunch / belly*, **ep.** *Il.* 5.539, *Od.* 7.216; **lyr.** *Pi. P.* 4.99; **dr.** *A. Ag.* 726, *S. Ph.* 287, *E. Supp.* 865, *Ar. Ach.* 733; **pr.** *Hdt.* 1.123, *Xen. An.* 2.5.33, *Lg.* 792e3, *Hp. Prog.* 3, *Epid.* 7.97. **57 n. 92, 58, 62, 82, 94, 201, 239, 254.**

ἐπιγάστριος: *covering over the abdominal cavity*, **pr.** *Hp. Vict.* 30; cf. *Ruf. Onom.* 97: τὸ ἐπὶ τῆς γαστρὸς δέρμα. **98 n. 126.**

ὑπογάστριον: *the lower belly from the navel downwards*, **dr.** *Stratt.* fr. 32 K.-A., *Ar. V.* 195, *Antiphan.* fr. 190 K.-A.; **pr.** *Hp. Epid.* 7.97, *Aph.* 4.80; cf. *Arist. HA* 503a17. **206.**

γένυς: *jaw*, **ep.** *Il.* 11.416, *Od.* 11.320; **lyr.** *Pi. O.* 13.85; **dr.** *A. Sept.* 122, *S. Ant.* 121, *E. HF* 693, *Ar. Lys.* 1257; **pr.** *Xen. Cyn.* 5.10, *Hp. Coac.* 234, *Epid.* 5.75. **180.**

γένειον: *part covered by the beard* (i.e. *chin*), **ep.** *Il.* 22.74, *Od.* 16.176; **lyr.** Anacr. fr. 34a, *Pi. O.* 1.68; **dr.** A. *Sept.* 666, *S. El.* 1208, *E. Hec.* 286, *Ar. Av.* 902; **pr.** *Hdt.* 6.117, *Xen. Cyr.* 8.3.30, *Hp. Art.* 33, *Epid.* 3.3.4.

γίγγλυμος: *joint* (lit. *hinge*, e.g. *Xen. Eq.* 12.6), **pr.** *Hp. Loc. Hom.* 6 (metaph.).

γλήνη: *eyeball*, **ep.** *Il.* 8.164, *Od.* 9.390; **dr.** *S. OT* 1277; cf. *Hp. Art.* 79: γληνοειδής, *eyeball-like*, in reference to large bone sockets. **217.**

γλωσσα, γλωττα: *tongue*, **ep.** *Il.* 5.74, *Od.* 3.332; **lyr.** Sapph. fr. 18, *Pi. O.* 9.42; **dr.** A. *Ag.* 637, *S. Aj.* 584, *E. HF* 229, *Ar. Ra.* 827; **pr.** *Hdt.* 9.122, *Th.* 2.68.5, *Pl. Smp.* 199a5, *Hp. Epid.* 1.3.13, *Prorrh.* 1.163.

ἐπιγλωσσίς: *epiglottis*, **pr.** *Arist. HA* 492b34; cf. [*Hp.*] *Cord.* 2.

ὑπογλωσσίς: *underside of the tongue*, **pr.** *Hp. Morb.* 2.11. **89.**

γνάθος: *jaw*, **lyr.** *Pi. N.* 1.42, **dr.** A. *Ch.* 280, *S.* fr. 848 Radt, *E. Med.* 1201, *Ar. Lys.* 635; **pr.** *Hdt.* 9.86, *Xen. Eq.* 1.9, *Pl. Phdr.* 254e4, *Hp. Art.* 31, *Carn.* 13, *VM* 19. **195.**

(γναθμός) **ep.** *Il.* 17.617, *Od.* 18.29, *Hes.* fr. 372 West; **dr.** *S.* fr. 507 Radt. **41.**

γομφίος: *molar*, **dr.** Epicharm. fr. 18 K.-A., *Ar. Pax* 34; **pr.** *Hdt.* 9.83, *Xen. Mem.* 1.4.6, *Hp. Epid.* 5.100, *Oss.* 12; cf. *Arist. HA* 501b24. **195.**

γόνυ: *knee*, **ep.** *Il.* 7.118, *Od.* 6.310, *Hes. Op.* 587; **lyr.** *Pi. I.* 3/4.43; **dr.** A. *Per.* 930, *S. OT* 1607, *E. Tr.* 1307, *Ar. Ra.* 345; **pr.** *Hdt.* 1.189, *Xen. An.* 3.2.23, *Pl. R.* 617b4, *Hp. Art.* 82, *Epid.* 4.25, *Loc. Hom.* 6; cf. *Arist. HA* 494a18. **48, 95 n. 102.**

ἐπιγουνίς: *great muscle of the thigh*, **ep.** *Od.* 17.225; *knee pan*, **pr.** *Hp. Art.* 70. **95 n. 102.**

γυῖον: *limb* (or part of), **ep.** *Il.* 3.34, *Od.* 1.192, *Hes. Th.* 492 (*h. Merc.* 20 = *womb*); **lyr.** *Pi. N.* 8.38 (cf. *N.* 7.73 = *whole body*); **dr.** A. *Per.* 913, *E. HF* 231; **pr.** *Pl. Ion* 539a2 (= *Od.* 20.352); *Hp. Int.* 31, *Loc. Hom.* 30, *Epid.* 4.1. **36, 46-47.**

γυναικεῖα: *female genitals* (adj. *of/belonging to women*), **pr.** *Hp. Epid.* 6.8.32, *Coac.* 537, *Nat. Mul.* 109.

Δ

δάκτυλος: *digit* (usually *finger*), **ep.** (only in the compound ῥοδοδάκτυλος, *rosy-fingered*) *Il.* 1.477, *Od.* 2.1; **lyr.** Alc. fr. 346; **dr.** *E. Or.* 1432 (cf. *A. Ag.* 1332: δακτυλοδεικτος = *pointed at with the finger*), *Ar. Nu.* 651; **pr.** *Hdt.* 1.179, *Xen. Eq.* 6.8, *An.* 4.5.13 (*toe*), *Pl. R.* 523c5, *Hp. Prog.* 17, *Epid.* 7.170, *Carn.* 19. **75 n. 31.**

δειρή: *neck / throat*, **ep.** *Il.* 3.371, *Od.* 23.240, *h. Cer.* 389, *Hes. Th.* 727; **lyr.** Anacr. fr. 96a; **dr.** *E. Ion* 1065; **pr.** *Hdt.* 2.76, *Pl. Ion* 539c3 (= *Il.* 22.204), *Hp. Mul.* 38.

δελφύς: *womb*, **pr.** *Hp. Mul.* 222; cf. *Arist. HA* 510b13.

δέμας: *bodily frame*, **ep.** *Il.* 1.115, *Od.* 2.268, *Hes. Th.* 260; **lyr.** *Pi. O.* 1.20; **dr.** A. *Per.* 209, *S. El.* 57, *E. Med.* 338, *Pl. Com.* fr. 189 K.-A. **35-39, 73 n. 22.**

δέρμα: *skin / hide*, *Il.* 16.341, *Od.* 13.431, *Hes. Op.* 513; **dr.** A. fr. 275.4 Radt, *E. Cyc.* 528, *Ar. Pax* 746; **pr.** *Hdt.* 4.64, *Xen. Mem.* 2.1.17, *Pl. Smp.* 190e6, *Hp. Epid.* 3.3.17, *Art.* 11, *Morb.* 2.7. **43 n. 66, 47, 83-84, 236, 250, 253.**

δέρρις: *skin* (always of an animal), **dr.** *Eup.* fr. 357 K.-A., *Pl. Com.* fr. 267 K.-A. **189 n. 11.**

δέρτρον: *omentum*, **ep.** *Od.* 11.579, *Antim.* fr. 47; **pr.** *Hp. Epid.* 5.26. **33, 79.**

δημός: *fat*, **ep.** *Il.* 8.380, *Od.* 14.428, *Hes. Th.* 538; **dr.** *Ar. V.* 40. **33 n. 38, 44 n. 68, 45 n. 70.**

διάφραγμα: *diaphragm* (lit. *partition*, e.g. *Th.* 1.133), **pr.** *Pl. Ti.* 84d7, *Hp. Epid.* 5.95, *Virg.* 1 (διάφραξις); *velum of the palate*, *Hp. Epid.* 2.2.24. **260-62.**

διπλόη: *diploë* (porous substance between the double plates in the skull bone), **pr.** *Hp. VC* 1, *Morb.* 2.23 (διπλοίς). **96.**

E

ἔγκατα: *viscera*, **ep.** *Il.* 11.176, *Od.* 9.293. **57 n. 93, 73 n. 22.**

ἔδρη: *buttocks* (lit. *seat*, e.g. *Il.* 19.77), **dr.** *Ar. Th.* 133; **pr.** *Xen. Eq.* 5.6, *Hp. Prorrh.* 2.23, *Nat. Hom.* 15; *anus*, *Hdt.* 2.87, *Hp. Aër.* 3. **234-35.**

καθέδρη: *buttocks* (lit. *seat*, e.g. *Th.* 2.18.5), **pr.** *Xen. Cyn.* 4.4, *Hp. Mul.* 230, *Int.* 47.

ἔλυτρον: *membrane* (lit. *sheath*, e.g. *Ar. Ach.* 1120), **pr.** *Hp. Art.* 45 (of spine); cf. *Arist. de An.* 421b29 (of eye-lid). **206.**

ἔνδινα: *viscera*, **ep.** *Il.* 23.806. **57 n. 93.**

ἔντερα: *intestines*, **ep.** *Il.* 13.507, *Od.* 21.408; **dr.** *A. Ag.* 1221, *E. fr.* 383.476 *Nauck*, *Ar. Ra.* 476; **pr.** *Xen. An.* 2.5.33, *Pl. Ti.* 73a3, *Hp. Epid.* 5.21, *Morb.* 3.1, *Nat. Hom.* 12. **57-58, 94, 99, 167 n. 95, 241, 257.**

μεσεντέριον: *membrane of the intestines*, **pr.** *Hp. Epid.* 2.4.2; cf. *Arist. HA* 495b32. **99.**

ἐντοσθίδια: *entrails*, **pr.** *Hp. Mul.* 230, *Epid.* 2.6.13; cf. *Arist. PA* 684b32. **99.**

ἐπίπλοον, ἐπίπλοος: *omentum* (visceral fold over the stomach), **dr.** *Epich. fr.* 69 K.-A.; **pr.** *Hdt.* 2.47, *Hp. Aph.* 5.46, *Prorrh.* 2.10, *Loc. Hom.* 24. **99, 189 n. 11, 231.**

ἐπισκύνιον: *skin of the brow*, **ep.** *Il.* 17.136; **dr.** *Ar. Ra.* 823; cf. *Arist. GA* 780b28. **33 n. 38, 40.**

ἐπίφυσις: *attachment of a long bone*, **pr.** *Hp. Art.* 27, *Fract.* 12; cf. *Epid.* 3.3.7 = *growth on skin.* **89, 95-96, 210.**

Z

ζύγωμα: *cheek bone / zygomatic arch*, **pr.** *Hp. Art.* 30 (cf. *Plb.* 7.16.5 = *bar*). **95.**

ζώνη: *waist* (lit. *belt / girdle*, e.g. *Od.* 5.231), **ep.** *Il.* 2.479; **pr.** *Hp. Art.* 14; cf. *Erot. Onom.* 74 = ὄσφύς. **61 n. 107.**

H

ἥπαρ: *liver*, **ep.** *Il.* 11.579, *Od.* 11.578, *Hes. Th.* 523; **lyr.** *Archil. fr.* 234; **dr.** *A. Ch.* 272, *S. Aj.* 938, *E. Or.* 1063, *Ar. fr.* 304.5 K.-A.; **pr.** *Pl. Ti.* 71b7, *Hp. Epid.* 2.2.23, *VM* 22, *Aph.* 7.45. **54-55, 98, 113, 167, 175, 206, 257.**

ἥπατις: *hepatic vessel* (sc. φλέψ), **pr.** *Hp. Epid.* 2.4.1, *Morb.* 1.28, *Arist. HA* 512a30; cf. *Hp. Int.* 27 = *disease of the liver.* **102-4, 111, 174.**

ἤτορ: *heart* (seat of emotion), **ep.** *Il.* 1.188, *Od.* 1.48, *Hes. Th.* 163; **lyr.** *Alcm. fr.* 26.1.4; **dr.** *A. Per.* 991; **pr.** *Pl. R.* 388c5 (= *Il.* 22.169). **51-52, 74, 203.**

ἤτρον: *abdomen*, **dr.** *Ar. Th.* 509; **pr.** *Xen. Eq.* 12.4, *Pl. Phd.* 118c5, *Hp. Epid.* 6.2.19, *Coac.* 446, *Mul.* 2.58; cf. *Arist. HA* 493a19. **203-206.**

Θ

θέναρ: *palm of the hand*, **ep.** *Il.* 5.339; **lyr.** *Pi. P.* 4.206; **pr.** *Hp. Fract.* 39, *Art.* 16, *Epid.* 6.5.7; cf. *Arist. HA* 502b8; *sole of the foot*, *Hp. Mul.* 116. **33 n. 38, 154 n. 59.**

θηλή: *nipple*, **dr.** *E. Cyc.* 584; **pr.** *Pl. Cra.* 414a4, *Hp. Epid.* 6.5.11, *Mul.* 61, *Aër.* 19.

θώραξ, θώρηξ: *chest / torso* (lit. *breastplate*, e.g. *Il.* 4.133), **dr.** *E. HF* 1095, *Ar. V.* 1194; **pr.** *Pl. Ti.* 69e4, *Hp. de Arte* 10, *Mul.* 174; cf. *Arist. HA* 493a17. **6, 159-64, 109, 208, 259.**

Ι

ἰγνύη: *part behind the thigh and knee*, **ep.** *Il.* 13.212, *h.Merc.* 152; **pr.** *Nat. Mul.* 12, *Fract.* 18, *Art.* 57, *Nat. Hom.* 11. **33 n. 38, 242.**

ἴκταρ: *female genitals* (lit. adv. *close together*, e.g. *Hes. Th.* 691), *Mul.* 174; cf. *Gal. Ling. Hp.* 19.105 K: τὸ τῆς γυναικὸς αἰδοῖον καλεῖται.

ἴνες: *fascia / sinews*, **ep.** *Il.* 23.191, *Od.* 11.219; **dr.** ; **pr.** *Hp. Flat.* 12, *Loc. Hom.* 5, *Arist. HA* 515b27; *fibrine of the blood*, *Pl. Ti.* 85d2, *Hp. Morb.* 2.47; cf. *Arist. PA* 650b18. **49-50, 210-14, 262.**

ἰνίον: *occipital bone*, **ep.** *Il.* 5.73 (*neck muscle* ?); **pr.** *Pherecyd. fr.* 22b, *Hp. Aph.* 3.26, *Oss.* 3; cf. *Arist. HA* 491a33. **40, 49 n. 76.**

ἰξύς: *waist*, **ep.** *Od.* 5.231; **pr.** *Hp. Epid.* 5.61, *Art.* 47, *Nat. Mul.* 2.

ἰσθμός: *neck*, **dr.** *S. fr.* 568 Radt; **pr.** *Pl. Ti.* 69e1.

ἰσθμιον: *pharynx* (adj. *of the throat*, e.g. *Od.* 18.300 [of a necklace]), **pr.** [*Hp.*] *Dent.* 21. **110, 204.**

παρίσθμιον: *tonsils*, **pr.** *Hp. Gland.* 7, *Aph.* 3.26 (inflammation of the tonsils); cf. *Arist. HA* 493a1. **110.**

ἰσχίον: *hip joint*, (pl.) *haunches*, **ep.** *Il.* 8.340, *Od.* 17.234; **pr.** *Hdt.* 6.75, *Xen. Eq.* 7.7, *Pl. Ti.* 75a1, *Hp. Aër.* 20, *Epid.* 3.3.17, *Art.* 53. **62, 95, 109, 210 n. 89.**

Κ

κανθός: *corner of the eye*, **pr.** *Hp. Epid.* 7.11, *Morb.* 2.12, *Loc. Hom.* 3; cf. *Arist. HA* 491b6.

καρδία, κραδία: *heart*, *Il.* 10.94, *Od.* 4.293, *Hes. Th.* 99; **lyr.** *Pi. N.* 1.54, *Sapp. fr.* 31; **dr.** *A. Supp.* 785, *S. Ant.* 1085, *E. Hipp.* 1274, *Ar. Ra.* 482; **pr.** *Hdt.* 3.35, *Th.* 2.48.3, *Xen. Smp.* 4.28, *Pl. Ti.* 65d1, *Hp. Morb. Sacr.* 6, *Epid.* 3.2.12, *Aff.* 15. **53-54, 98, 106, 109, 113-14, 141, 167, 201-3, 206, 222, 231, 238-39, 241, 257.**

καρπός: *wrist*, **ep.** *Il.* 5.458, *Od.* 22.277; **dr.** *E. Ion* 1009; **pr.** *Xen. Cyr.* 6.4.2, *Hp. Fract.* 4, *Art.* 64, *Aër.* 20; cf. *Arist. HA* 494a2. **154 n. 57.**

κάρα, κάρη: *head*, **ep.** *Il.* 2.11, *Od.* 1.90, *Hes. Op.* 534; **lyr.** *Anacr. fr.* 1.2; **dr.** *A. Ch.* 496, *S. Aj.* 9, *E. Med.* 1152, *Ar. Ach.* 1218 (cf. *καρηβαρικός* = *subject to headaches*, e.g. *Telecl. fr.* 66 K.-A., *Hp. Aph.* 3.5, *Coac.* 537, *Epid.* 3.3.17). **73 n. 23.**

κέαρ, κῆρ: *heart*, **ep.** *Il.* 18.535, *Od.* 1.310; **lyr.** *Pi. P.* 10.22; **dr.** *A. Sept.* 287, *S. Aj.* 686, *E. Med.* 398, *Ar. Ach.* 5; **pr.** *Pl. Th.* 194c7 (= *Il.* 2.851, 16.554). **52 n. 79.**

κενέων: *hollow between the ribs and flank*, **ep.** *Il.* 5.284, *Od.* 22.295; **pr.** *Xen. Eq.* 11.2, *Hp. Epid.* 1.2.8, *Art.* 52, *Int.* 14.

κερκίς: *tibia* (lit. *weaver's shuttle*, e.g. *Il.* 22.448), **pr.** *Hp. Oss.* 17; cf. *Plu. Alex.* 45 = κνήμη.

κεφαλή: *head*, **ep.** *Il.* 11.39, *Od.* 4.70, *Hes. Th.* 924; **lyr.** *Thgn.* 1.1012, *Pi. P.* 9.31; **dr.** *A. Sept.* 525, *S. Aj.* 238, *E. Med.* 144, *Ar. Av.* 475; **pr.** *Hdt.* 1.195, *Th.* 2.49, *Xen. An.* 7.4.4, *Pl. Ti.* 75c7, *Hp. Aph.* 5.69, *Loc. Hom.* 1, *Epid.* 2.6.1; also the end of other anatomical parts, e.g. *Art.* 55 (of the femur), *Fract.* 3 (of the humerus). **48, 73-74, 82, 181.**

ἐγκέφαλος: *brain*, **ep.** *Il.* 16.347, *Od.* 9.290; **dr.** *E. Hipp.* 1352, *Cyc.* 402, *Ar. Nu.* 1276; **pr.** *Pl. Ti.* 73d1, *Hp. VC* 2, *Aph.* 6.18, *Morb.* 1.3. **81-82, 105, 188, 234, 241, 250 n. 101, 257.**

κίθαρος: *chest* (from κίθαρα, *lyre*, e.g. *Hdt.* 1.24), **pr.** *Hp. Loc. Hom.* 3. **166.**

κίων: *tonsil* (lit. *pillar*, e.g. *Od.* 8.66), **pr.** *Hp. Epid.* 1.26, *Arist. HA* 493a3; cf. *Hp. Nat. Mul.* 65 = wart.

κιονίς: *uvula* (dim. of κίων), **pr.** *Hp. Acut.* 6. **109.**

κισσός: *varicose vein*, **pr.** *Xen. Eq.* 1.5 (κρυσσός), *Hp. Aër.* 7, *Epid.* 2.1.7, *Art.* 41. **101 n. 43, 246.**

κλήις, κλείς: *collarbone* (lit. *bar*, e.g. *Il.* 14.168), **ep.** *Il.* 21.47; **dr.** *S. Tr.* 1035; **pr.** *Hp. Acut.* 7, *Epid.* 1.3.13, *Loc. Hom.* 14, *Art.* 13. **59, 92.**

κνήμη: *shin*, **ep.** *Il.* 4.147, *Od.* 8.135, *Hes. Sc.* 123; **lyr.** *Archil.* fr. 114; **dr.** *S.* fr. 608 Radt, *E. Ph.* 1394, *Ar. Pl.* 275; **pr.** *Hdt.* 6.125, *Xen. Eq.* 1.16, *Hp. Epid.* 4.30, *de Arte* 10, *Morb.* 2.71. **109.**

ἀντικνήμιον: *part of the leg in front of the κνήμη*, **dr.** *Ar. Ach.* 218; **pr.** *Xen. Cyr.* 2.3.19, *Hp. Fract.* 23, *Ulc.* 25; cf. *Arist. HA* 494a6. **89, 109.**

γαστροκνήμη, γαστροκνημία: *calf of the leg*, **pr.** *Hp. Art.* 60, *Coac.* 76; cf. *Arist. HA* 494a7.

περικνήμια: *flesh of the leg*, **pr.** *Hp. Epid.* 3.4 (dub.).

κοιλία: *cavity of the body* (esp. the belly), **dr.** *Ar. Ra.* 485; **pr.** *Hdt.* 2.86, *Th.* 2.49, *Pl. Ti.* 85e10, *Hp. Epid.* 1.2.4, *VC* 11, *Aër.* 3. **71 n. 15, 94, 109, 200-3, 206 n. 75.**

κόλον: *colon*, **dr.** *Ar. Eq.* 455; cf. *Arist. PA* 675b7.

κόνδυλος: *knuckle bone*, **dr.** *Pherecr.* fr. 48 K.-A., *Ar. Eq.* 1236; **pr.** *Hp. Epid.* 4.19, *Loc. Hom.* 6, *Art.* 2.

κόρη: *pupil* (lit. *girl*, e.g. *A. Supp.* 145), **dr.** *E. Hec.* 972, *Ar. V.* 7; **pr.** *Pl. Alc.* 1.133a2, *Hp. Prorrh.* 2.20, *Int.* 48, *Epid.* 7.26. **110.**

κόρη: *temple*, **ep.** *Il.* 4.502; **lyr.** *Alc.* fr. 338.7; **dr.** *A. Ch.* 282. **73 n. 22, 144-45.**

κορώνη, κορωνόν: *condyle* (bony outgrowth), **pr.** *Hp. Art.* 18, *Fract.* 45, *Mochl.* 8.

κοτίς: *occiput*, **pr.** *Hp. Morb.* 2.12; cf. *Erot.* fr. 56: κοτίς ἐστί τῆς κεφαλῆς ἢ κορυφή.

κοτύλη: *hip socket* (lit. *cup*, e.g. *Il.* 22.494) **ep.** *Il.* 5.306; **pr.** *Hp. Art.* 79, *Loc. Hom.* 6, *Int.* 18 (κοτυλίς). **33 n. 38, 89, 109, 209.**

κοτυληδών: *hip socket*, **dr.** *Ar. V.* 1495; **pr.** *Hp. Int.* 18, *Oss.* 3; *cotulydons* (foetal and uterine vascular connections), **pr.** *Hp. Nat. Mul.* 17, *Aph.* 5.45; cf. *Arist. GA* 745b33. **95, 207-10.**

κοχώνη: *perineum*, **dr.** *Eup.* fr. 159 K.-A., *Ar. Eq.* 424; **pr.** *Hp. Mul.* 8, *Epid.* 5.7.

κραδία: see καρδία.

κρανίον: *upper part of the head*, **ep.** *Il.* 8.84; **lyr.** *Pi. I.* 3/4.72; **dr.** *E. Cyc.* 647, *Ar. fr.* 380 K.-A.; **pr.** *Pl. Euthd.* 299e5, *Hp. VC* 2, *Epid.* 7.124. **33 n. 38, 96 n. 108, 250 n. 101.**

κρέας: *flesh* (usually of animals), **ep.** *Il.* 4.345, *Od.* 1.112, *Hes. Op.* 591; **lyr.** *Thgn.* 1.239; **dr.** *S. fr.* 767 Radt, *E. Cyc.* 126, *A. R.* 509; **pr.** *Hdt.* 1.216, *Th.* 4.16.1, *Xen. An.* 1.5.2, *Pl. R.* 338c8, *Hp. VM* 13, *Morb.* 2.34, *Epid.* 7.3. **44-45, 65, 83, 206, 231, 236.**

κρημνοί: *labia* (lit. *overhanging bank*, e.g. *Il.* 12.54), **pr.** *Hp. Loc. Hom.* 29; cf. *Erot. Onom.* 90: κρημνοί· τὰ χεῖλη τοῦ γυναικείου αἰδοίου.

κρόταφος: *side of the head*, **ep.** *Il.* 4.502, *Od.* 11.319, *Hes. Scut.* 137; **lyr.** *Anacr. fr.* 50; **dr.** [*A.*] *Pr.* 721, *E. Tr.* 115, *Ar. Ra.* 854; **pr.** *Hdt.* 3.8, *Hp. Art.* 30, *Prog.* 2, *Epid.* 2.2.24, *Loc. Hom.* 13. **110, 145 n. 32, 230.**

κροταφίτης: *temporal muscle* (sc. μῦς), **pr.** *Hp. Art.* 30; cf. *Ruf. Onom.* 142: κροταφῖται· οἱ [μύες] δὲ περὶ τὴν κάτω γνάθον. **110-12.**

κτεῖς: *metacarpal bones* (lit. *comb*, e.g. *Pherecr. fr.* 101 K.-A.), **dr.** *A. Ag.* 1554; *genitals*, **pr.** *Hp. Aph.* 7.39, *Art.* 63, *Morb.* 2.48. **152-56.**

κύβιτον: *elbow*, **pr.** *Hp. Loc. Hom.* 6; cf. *Ruf. Onom.* 79 = ὀλέκρανον.

κύλον: *part under the eye*, **pr.** *Hp. Morb.* 2.48, *Nat. Mul.* 9, *Mul.* 37.

κύσθος: *vulva*, **dr.** *Eup. fr.* 247 K.-A., *Ar. Ach.* 782.

κύσσαρος: *anus*, **pr.** *Hp. Nat. Puer.* 17.

κύστις: *bladder*, **ep.** *Il.* 5.67; **dr.** *Ar. Nub.* 405; **pr.** *Pl. Ti.* 91a5, *Hp. Prog.* 19, *Aph.* 6.18, *Aër.* 9. **57, 74, 99.**

κύστιγξ: *small internal sack*, *Gal. Ling. Hp.* 19.116 K.

κύτος: *hollow cavity of the body, trunk* (lit. *hollow*, e.g. *A. Th.* 495 [of a shield]), **dr.** *S. Tr.* 12; **pr.** *Pl. Ti.* 74a3; cf. *Arist. HA* 491a29. **157-59, 259.**

κωλή, κωλήν: *thigh, leg*, **dr.** *Eup. fr.* 54 K.-A., *Ar. Pl.* 1128; **pr.** *Xen. Cyn.* 5.30, *Hp. Epid.* 7.62.

κώληψ: *hollow of the knee*, **ep.** *Il.* 23.726. **33 n. 38, 73 n. 22.**

κῶλον: *limb*, **dr.** *A. Ag.* 344, *S. OC* 183, *E. Ph.* 1185; **pr.** *Hdt.* 4.108, *Pl. Ti.* 76e6; *intestine*, *Hp. Epid.* 6.4.6; cf. *Oss.* 1. **85.**

ἄκροκώλια: *extremities of the body*, **dr.** *Pherecr. fr.* 113 K.-A., *Ar. fr.* 4 K.-A.; **pr.** *Hp. Vict.* 75, *Mul.* 169.

μεσόκωλον: *membrane of the intestines* (part of the mesentery), **pr.** *Hp. Epid.* 6.4.6. **85, 99 n. 126.**

Λ

λαγών: *flank*, **ep.** *Batr.* 222; **dr.** *E. Hec.* 559, *Ar. Ra.* 662; **pr.** *Xen. Cyn.* 4.1, *Hp. Aff.* 22, *Int.* 25.

λαιμός: *throat*, **ep.** *Il.* 13.388, *Od.* 22.15; **lyr.** *Tim. fr.* 15 col. 4.130; **dr.** *E. Hec.* 565, *Ar. Av.* 1560; **pr.** *Hp. Epid.* 6.6.1. **101 n. 135, 172, 189 n. 11.**

λακκόπεδον: *scrotum*, **dr.** *Aristag. fr.* 4 K.-A.

λαπάρη: *flank*, **ep.** *Il.* 3.359; **dr.** *Epich. fr.* 79 K.-A.; **pr.** *Hdt.* 2.86, *Xen. Cyn.* 5.30, *Hp. Epid.* 2.6.5, *Coac.* 290, *Flat.* 9. **58, 62, 230.**

λάρυγγ: *larynx, upper part of the windpipe*, **dr.** *E. Cyc.* 158, *A. Ra.* 575; **pr.** *Carn.* 18, *Oss.* 1; cf. *Arist. HA* 499a1.

λαυκανίη: *throat*, **ep.** *Il.* 22.325. **59, 73 n. 22.**

λοβός: *lobe (of the liver)*, **dr.** *A. Eum.* 158, *E. El.* 827; **pr.** *Pl. Ti.* 71c1, *Hp. Prog.* 2, *Loc. Hom.* 14, *Epid.* 6.8.28; cf. *Arist. HA* 492a16. **174-75, 215.**

λόφος: *nape of the neck*, **ep.** *Il.* 10.573; **dr.** *S. Ant.* 292 (more commonly for the withers of a horse, e.g. *Il.* 23.508; or for a tuft of hair, e.g. *Ar. Eq.* 496). **73 n. 22, 149.**

M

μάλη: *armpit*, **dr.** *Ar. Lys.* 985; **pr.** *Xen. HG* 2.3.23, *Pl. Grg.* 469d1.

μαζός, μαστός: *breast*, **ep.** *Il.* 4.528, *Od.* 22.82; **lyr.** *Archil. fr.* S478a48; **dr.** *A. Ch.* 531, *S. Tr.* 925, *E. Hec.* 424, **pr.** *Hdt.* 4.202, *Hp. Aër.* 17, *Nat. Hom.* 11, *Prorrh.* 2.24. **61.**

μασσητήρ: *jaw muscle (sc. μῦς)*, **pr.** *Hp. Art.* 30. **110-12.**

μασχάλη: *armpit*, **dr.** *A. fr.* 39.2 Radt, *Ar. Ach.* 852 (cf. *S. fr.* 623 Radt: *μασχαλισμάτα* = *extremities cut off from a corpse*); **pr.** *Simon Atheniensis Eq.* 12.6, *Hp. Epid.* 7.43, *Art.* 71, *Nat. Hom.* 11. **75 n. 31.**

μέλος: *limb (or part of)*, **ep.** *Il.* 23.191, *Od.* 14.428, *Hes. Op.* 149; **lyr.** *Pi. O.* 1.47; **dr.** *A. Per.* 463, *E. Hec.* 720; **pr.** *Hdt.* 1.119, *Pl. Ti.* 74b5, *Arist. HA* 486a9; *parts of the body*, *Hp. Aff.* 43, *Loc. Hom.* 1, *Morb. Sacr.* 8, **46-47.**

μετώπιον: *forehead*, **ep.** *Il.* 11.95; cf. *Hp. Mul.* 171: *μετωπίδος* = *adj., on/of the forehead.*

μήδεα: *male genitals*, **ep.** *Od.* 18.67. **61 n. 105, 73 n. 22.**

μηνιγξ: *membrane (usually of the brain = dura mater)*, **pr.** *Hp. VC* 17, *Loc. Hom.* 2, *Epid.* 5.27, *Carn.* 3 (general); cf. *Arist. HA* 514a17. **81, 100.**

μηρός: *thigh*, **ep.** *Il.* 1.190, *Od.* 11.231, *Hes. Sc.* 460; **lyr.** *Archil. fr.* 66; **dr.** *A. fr.* 135.1 Radt, *S. Ant.* 1011, *E. Andr.* 598, *Ar. Lys.* 552; **pr.** *Hdt.* 1.191, *Xen. An.* 7.4.4, *Pl. Ti.* 74e10, *Hp. Epid.* 2.1.7, *Art.* 52, *Loc. Hom.* 6.

μήτρα: *womb*, **dr.** *Telecl. fr.* 1.14; **pr.** *Hdt.* 3.108, *Pl. Ti.* 91d2, *Hp. Aër.* 21, *Mul.* 64, *Prorrh.* 2.25. **74, 99, 204 n. 64.**

μίτρον: *epididymis (duct behind the testis; lit. girdle, e.g. Il. 4.137)*, **pr.** *Hp. ap. Gal. Ling. Hp.* 19.123 K.

μύλη: *knee pan (lit. mill, e.g. Od. 7.104)*, **dr.** *Com. Adesp.* 450; **pr.** *Hp. Loc. Hom.* 6, *Arist. HA* 454a5; cf. *Hp. Mul.* 1.71 = *hard formation in the womb.* **95 n. 102.**

(ἐπιμυλίσ) **pr.** *Hp. Mochl.* 1; cf. *Ruf. Onom.* 120: ἐπιγονατίς· Ἴπποκράτης δὲ ἐπιμυλίδα ὀνομάζει. **95.**

μυκτήρ: *nostril*, **dr.** *S. fr.* 1135.3 Radt, *E. Alc.* 493, *Ar. V.* 1488; **pr.** *Hdt.* 3.87, *Xen. Smp.* 5.6, *Pl. Ti.* 79c7, *Hp. Prorrh.* 1.1.3, *Art.* 38, *Morb. Sacr.* 7. **208, 234.**

(μυξωτήρ) **pr.** *Hdt.* 2.86. **234.**

μῦς: *muscle (lit. mouse / rat, e.g. Batr. 173)*, **ep.** *Il.* 16.315 (μυών); **pr.** *Hp. de Arte* 10, *Fract.* 4. **45-46, 110.**

N

νεῖρα: *lower abdomen*, **dr.** A. *Ag.* 1479, **pr.** Hp. *Coac.* 579 (νεῖαιρα); cf. Hsch. s.v.: οἱ δὲ κοιλίας τὰ κατώτατα; and νεῖαιρη γαστήρ, e.g. *Il.* 5.539, Hp. *Mul.* 175, *Morb.* 2.40.

νεῦρον: *sinew, tendon*, **ep.** *Il.* 16.316; **pr.** Xen. *An.* 3.4.17 (of a bowstring), Pl. *Phd.* 80d1, Hp. *Epid.* 4.43, *Art.* 11, *Flat.* 8; cf. Arist. *HA* 515b4. **33 n. 38, 48, 71 n. 15, 78 n. 39, 212, 263.**

νευρίον, νευρίνη: *small tendon* (possibly *nerve*), **pr.** Hp. *Mochl.* 1.28, *Morb.* 2.35.

νευροκοίλιος: *hollow cord* (possibly the parotid duct in the jaw [Craik 1998a: 118]), **pr.** Hp. *Loc. Hom.* 5.

νεφρός: *kidney*, **dr.** Ar. *Ra.* 475 (cf. 1280 = *testicles*); **pr.** Pl. *Ti.* 91a5, Hp. *Aph.* 5.58, *Epid.* 5.26, *Nat. Hom.* 11, Arist. *HA* 497a6; cf. ἐπινεφρίς, *Il.* 21.104. **56-57, 98, 102 n. 147, 167, 206, 264.**

νηδύς: *abdomen, womb*, **ep.** *Il.* 20.486, *Od.* 9.296, Hes. *Th.* 487; **dr.** A. *Eum.* 665, S. *OC* 1263, E. *Andr.* 356; **pr.** Hdt. 2.47, Hp. *de Arte* 12, *Carn.* 13, *Mul.* 64; cf. *VM* 10: νηδύες = *bodily cavities*. **61 n. 106, 71 n. 15, 98, 232.**

νηστίς: *jejenum* (middle section of the small intestine; lit. *fasting*, e.g. *Il.* 19.207), **dr.** Ar. fr. 520 K.-A.; **pr.** Hp. *Carn.* 13; cf. Arist. *PA* 675b34. **99 n. 118.**

νώτον: *back*, **ep.** *Il.* 5.147, *Od.* 8.475, Hes. *Op.* 468; **lyr.** Pi. *P.* 4.83; **dr.** A. *Supp.* 91, S. *Aj.* 110, E. *Hec.* 739, Ar. *V.* 1295; **pr.** Hdt. 6.57, Xen. *Mem.* 3.10.13, Pl. *Smp.* 189e6, Hp. *Epid.* 4.25, *Art.* 45, *Nat. Hom.* 11. **62.**

Ξ

ξυγκαμπή: see συγκαμπή.

Ο

όδους: *tooth*, **ep.** *Il.* 11.416, *Od.* 10.263, Hes. *Sc.* 235; **lyr.** Pi. *N.* 4.64; **dr.** S. fr. 897 Radt, E. *Ba.* 621, Ar. *Pax* 1310; **pr.** Hdt. 9.83, Xen. *Mem.* 1.4.6, Pl. *Phdr.* 251c2, Hp. *Epid.* 4.19, *Art.* 34, *Morb. Sacr.* 7; *spinal dens*, **pr.** Hp. *Epid.* 2.2.24. **110, 112.**

οἰσοφάγος: *esophagus*, **pr.** Hp. *Loc. Hom.* 3; cf. Arist. *HA* 524b9. **101.**

ὄμμα: *eye*, **ep.** *Il.* 1.225, *Od.* 1.208, Hes. *Sc.* 262; **lyr.** Pi. *P.* 5.56; **dr.** A. *Sept.* 537, S. *Ph.* 151, E. *Med.* 27, Ar. *Lys.* 1283; **pr.** Hdt. 6.117, Xen. *Smp.* 8.3, Pl. *R.* 508b1, Hp. *Epid.* 2.3.1, *de Arte* 11, *Aph.* 3.17.

(ὄσσε: *eyes*) **ep.** *Il.* 1.104, *Od.* 4.186, Hes. *Th.* 698; **dr.** A. *Per.* 1065, E. *Tr.* 1315.

ὀμφαλός: *navel*, **ep.** *Il.* 4.525, *Od.* 1.50 (the ‘navel’ of the sea), Hes. fr. 33a26 West; **lyr.** Pi. *P.* 4.74; **dr.** S. *OT* 898 (the ‘navel’ of the earth), E. *Hec.* 559, Ar. *Pax* 175; **pr.** Hdt. 7.60, Xen. *An.* 4.5.2, Pl. *Ti.* 70e1, Hp. *Epid.* 1.3.13, *Aph.* 4.11, *Loc. Hom.* 24. **62, 158, 254.**

ὄνυξ: *nail of the hand or foot* (also *claw / talon*, e.g. *Il.* 8.248), **ep.** Hes. *Sc.* 266; **dr.** S. *Aj.* 310, E. *El.* 840, Ar. *Av.* 8; **pr.** Hdt. 4.64, Xen. *Mem.* 1.2.54, Pl. *Ti.* 76e4, Hp. *Loc. Hom.* 16, *Morb.* 2.47, *Prog.* 9.7.

ὄρρος: *rump*, Ar. *Lys.* 964, *Ra.* 222..

ὄρχις: *testicle*, **dr.** S. fr. 1130 Radt, Ar. *Nu.* 713; **pr.** Hdt. 4.109, Hp. *Epid.* 2.1.7, *Nat. Hom.* 11, *Loc. Hom.* 3. **75 n. 28, 198 n. 40.**

(ὄρχίπεδον) **dr.** Ar. *Eq.* 772, *Av.* 443.

ὀστέον: *bone*, **ep.** *Il.* 4.174, *Od.* 1.161, *Hes. Sc.* 152; **lyr.** *Simon.* 7.250.5; **dr.** *S. Tr.* 769, *E. Tr.* 1177, *Ar. Ach.* 1226; **pr.** *Hdt.* 1.67, *Th.* 1.126.12, *Xen. Eq.* 1.4, *Pl. Criti.* 111b5, *Hp. Epid.* 2.1.7, *Art.* 15, *Loc. Hom.* 6. **48, 149, 179-80, 231, 246.**

ὀσφύς: *loins / lower back*, **dr.** [A.] *Pr.* 497; **pr.** *Hdt.* 2.40, *Xen. Eq.* 11.2, *Hp. Epid.* 2.4.1, *Int.* 16, *Aër.* 20. **93 n. 89, 217, 246 n. 91.**

ὄσχη: *scrotum*, **pr.** *Hp. Coac.* 528, *Morb.* 2.71, *Int.* 21, *Epid.* 7.20 (ὄσχεον); cf. *Arist. HA* 493a33.

ὄσχος: *female peritoneal ligament*, **pr.** *Hp. Mul.* 2.204. **110.**

οὔθηρ: *udder / breast*, **ep.** *Il.* 9.141 (metaph. of rich land), *Od.* 9.440; **dr.** *A. Ch.* 532, *Ar. fr.* 112.2 K.-A.; **pr.** *Hdt.* 4.2; cf. *Arist. HA* 523a1. **75 n. 31.**

οὔλον: *gums*, **dr.** *A. Ch.* 898; **pr.** *Pl. Phdr.* 251c3, *Hp. Prorrh.* 2.36, *Morb.* 2.11, *Aff.* 4.

οὐρήθηρ: *urethra*, **pr.** *Hp. Aph.* 4.82, *Int.* 14, *Mul.* 9; cf. *Arist. HA* 493b4. **101.**

(οὐρητήρ) **pr.** *Hp. Aër.* 9, *Mul.* 137, *Coac.* 463.

οὔς: *ear*, **ep.** *Il.* 11.109, *Od.* ; **dr.** *A. Ch.* 380, *S. El.* 27, *E. Hipp.* 932, *Ar. Th.* 18; **pr.** *Hdt.* 2.162, *Xen. Mem.* 1.4.5, *Pl. Euthd.* 275e4, *Hp. Art.* 12, *Morb. Sacr.* 3, *Epid.* 1.2.9; *auricle of the heart*, **pr.** *Hp. de Arte* 10. **106, 109.**

ὀφθαλμός: *eye*, **ep.** *Il.* 16.349, *Od.* 4.115, *Hes. Op.* 267; *Sapph. fr.* 151; **dr.** *A. Per.* 168, *S. OT* 1377, *E. Hel.* 118, *Ar. Ec.* 11; **pr.** *Hdt.* 1.114, *Th.* 2.49.2, *Xen. Mem.* 2.3.19, *Pl. Prt.* 329d6, *Hp. Epid.* 6.4.22, *VM* 10, *Morb.* 1.8. **41, 102 n. 147, 105, 148, 238.**

ὑποφθάλμιος: *the parts below the eye*, **pr.** *Hp. Coac.* 136, *Mul.* 11; cf. *Erot. Onom.* 130: ὑποφθάλμιον· τὸ κύλον τοῦ ὀφθαλμοῦ.

ὀφρύς: *brow*, **ep.** *Il.* 14.493, *Od.* 9.389, *Hes. Th.* 827; **lyr.** *Anacr. fr.* 65; **dr.** *A. Ch.* 285, *S. Ant.* 528, *E. IA* 648, *Ar. Ach.* 18; **pr.** *Hdt.* 2.66, *Hp. Loc. Hom.* 6, *Epid.* 4.7, *VC* 13; cf. *Arist. HA* 518b7. **40, 146.**

Π

παραστάτης: *testicle*, **dr.** *Pl. Com. fr.* 188 K.-A.; *epididymis* (duct behind the testis), **pr.** *Hp. Oss.* 14 (so Potter 2010: 39).

παραφάσιες: *walls of vagina*, **pr.** *Hp. Mul.* 171; cf. *Gal. Ling. Hp.* 19.128 K: τοὺς κρυπτοὺς τόπους τοὺς κατὰ τὸ γυναικίον αἰδοῖον παραφάσις ὀνομάζουσι.

πάρᾳφυσις: *attachment point of muscle to bone*, **pr.** *Hp. Art.* 45; cf. *Gal. Ling. Hp.* 19.113 K.

παρειά: *cheek*, **ep.** *Il.* 11.393, *Od.* 8.522, *Hdt. Sc.* 243; **lyr.** *Simon. fr.* 38.1.5; **dr.** *A. Supp.* 70, *S. Ant.* 530, *E. Hec.* 410, *Ar. Pl.* 690; **pr.** *Hdt.* 1.134, *Xen. Cyr.* 6.4.3, *Pl. Pol.* 270e3. **73 n. 22, 164 n. 82.**

πέζα: *instep*, **pr.** *Hp. Mul.* 169; cf. *Gal. Ling. Hp.* 19.129 K.

πέος: *penis*, **lyr.** *Archil. fr.* 327; **dr.** *Ar. Ach.* 158. **75 n. 28.**

περίνεος: *perineum*, **pr.** *Hp. Art.* 14, *Mochl.* 20, *Aph.* 4.80; cf. *Arist. HA* 493b9. **156.**

περόνη: *small bone of the arm / radius*, **pr.** *Hp. Loc. Hom.* 6; *leg tendon*, *Xen. Eq.* 1.5 (perhaps also at *Loc. Hom.* 6). **95, 110, 246.**

πῆχυς: *forearm*, **ep.** *Il.* 21.166, *Od.* 17.38; **lyr.** *Simon.* 16.82.2; **dr.** *E. Heracl.* 728; **pr.** *Hdt.* 1.178, *Th.* 7.36.2 (in *Hdt.* and *Th.* always a distance of measurement, or *cubit*), *Xen. Eq.* 12.5 (the lower foreleg of a horse), *Pl. Ti.* 75a2, *Hp. Art.* 7, *Loc. Hom.* 6, *Epid.* 3.3.4; cf. *Arist. HA* 493b27. **109 n. 178, 230.**

πιμελή: *fat*, **dr.** *S. Ant.* 1011; **pr.** *Hdt.* 2.47, *Hp. Loc. Hom.* 24, *Int.* 22, *Aër.* 19; cf. *Arist. HA* 520a6. **231.**

πλώστη: *shoulder blade* (lit. *a broad object*, e.g. *A. Ag.* 695 [blade of an oar]), **pr.** *Hp. Loc. Hom.* 6; cf. *Erot. Onom.* 108 and *Poll.* 2.133 = ὠμοπλώστη. **95.**

πλεύμων: *lung*, **lyr.** *Alc. fr.* 347a1; **dr.** *A. Ch.* 639, *S. Tr.* 1054, *E. Or.* 277, *Ar. Ra.* 474; **pr.** *Pl. Ti.* 70d2, *Hp. Aph.* 5.10, *Nat. Hom.* 11, *Morb.* 1.11. **73 n. 23, 98, 167, 206, 257.**

(πνεύμων) **ep.** *Il.* 4.528; **lyr.** *Archil.* 13; **dr.** *Eup. fr.* 158 K.-A.; **pr.** *Hp. Epid.* 2.5.8, *Carn.* 16, *Gland.* 14. **55-56.**

πλευρή: *side of the body*, **ep.** *Il.* 4.468, *Od.* 17.232, *Hes. Sc.* 430; **lyr.** *Pi. N.* 10.70; **dr.** *A. Eum.* 843, *S. Ant.* 1236, *E. HF* 1379, *Ar. Nu.* 711; **pr.** *Hdt.* 9.72, *Xen. An.* 4.1.18, *Pl. Lg.* 796a5, *Hp. Epid.* 3.3.4, *Loc. Hom.* 14, *Art.* 45. **84 n. 56, 121, 162, 177, 197, 208.**

πλιχάς: *inside of the thighs, perineum*, **pr.** *Hp. Art.* 54, *Fract.* 20.

πόσθη: *penis*, **dr.** *Ar. Nub.* 1014.

(πόσθιον) **dr.** *Ar. Th.* 254; **pr.** *Hp. Epid.* 5.17, *Ulc.* 12.

πούς: *foot*, **ep.** *Il.* 2.217, *Od.* 1.164, *Hes. Op.* 497; **lyr.** *Pi. O.* 1.74; **dr.** *A. Supp.* 31, *S. Ph.* 7, *E. Heracl.* 728, *Ar. Ach.* 945; **pr.** *Hdt.* 3.129, *Th.* 2.49, *Xen. Mem.* 1.6.6, *Pl. R.* 400a1, *Hp. Art.* 53, *VM* 16, *Epid.* 1.2.9. **47, 236.**

πραπίδες: *midriff / diaphragm* (seat of emotion), **ep.** *Il.* 11.579, *Od.* 7.92, *Hes. Th.* 608; **lyr.** *Pi.. P.* 4.281; **dr.** *A. Ag.* 380, *E. Andr.* 480, *Ar. Th.* 103. **51-52, 54, 74.**

πρόσωπον: *face*, **ep.** *Il.* 18.414, *Od.* 8.85, *Hes. Op.* 594; **lyr.** *Pi. N.* 5.17; **dr.** *A. Ag.* 639, *S. El.* 1297, *E. Hipp.* 416, *Ar. Eq.* 38; **pr.** *Hdt.* 2.76, *Th.* 1.134.1, *Xen. Smp.* 3.10, *Pl. Smp.* 190e3, *Hp. Epid.* 2.3.1, *Aër.* 7, *Int.* 4.

πρότμησις: *waist*, **ep.** *Il.* 11.424; cf. *Hsch. s.v.* = κατὰ τὸν ὀμφαλόν. **33 n. 38.**

πρωκτός: *anus*, **dr.** *Ar. Ach.* 83, *Eub. fr.* 106 K.-A. **75 n. 29, 198-200.**

πτέρνη: *heel*, **ep.** *Il.* 22.397; **dr.** *A. Ch.* 209, *Cratin. fr.* 74 Austin; **pr.** *Hp. Art.* 47, *Fract.* 11, *Epid.* 5.48. **102 n. 147.**

πτέρυξ: *lobe of the lung* (lit. *wing*, e.g. *Il.* 2.316), **pr.** *Hp. Coac.* 394.

πυγή: *buttocks*, **dr.** *Ar. Th.* 1187; **pr.** *Hp. Nat. Puer.* 13. **75 n. 29.**

(πυγαῖον) **pr.** *Hdt.* 2.76, *Hp. Art.* 57, *Loc. Hom.* 6; cf. *Arist. HA* 620a15.

πύλη: *orifice, portal vein of the liver* (lit. *gate*, e.g. *Il.* 3.145), **dr.** *E. El.* 828; **pr.** *Pl. Ti.* 71c1, *Hp. Epid.* 2.4.1; cf. *Arist. HA* 496b3. **174-77.**

P

ῥαφή: *suture of the skull*, **dr.** *E. Ph.* 1159; **pr.** *Hdt.* 9.83, *Pl. Ti.* 76a5, *Hp. VC* 1, *Loc. Hom.* 6, *Epid.* 7.52. **180-84, 230.**

ῥάχις: *spine*, **ep.** *Il.* 9.208; **lyr.** *Archil. fr.* 21; **dr.** *A. Eum.* 190, *S. fr.* 20 Radt, *E. Cyc.* 643, *Ar. Lys.* 314; **pr.** *Hdt.* 7.216 (the 'spine' of a hill), *Xen. Eq.* 7.2, *Pl. Ti.* 77d3, *Hp. Epid.* 2.4.2, *Art.* 2, *Nat. Hom.* 11. **180, 209, 218.**

ῥέθος: *face / limb*, **ep.** *Il.* 16.856; **lyr.** *Sapph.* fr. 22; **dr.** *S. Ant.* 529, *E. HF* 1204; **pr.** *Pl. R.* 386d9 (= *Il.* 16.856). **73 n. 22.**

ῥίς: *nose* (pl. *nostrils*), **ep.** *Il.* 5.291, *Od.* 4.445, *Hes. Op.* 515; **dr.** [E.] *Rh.* 784, *Ar. Ec.* 630; **pr.** *Hdt.* 3.157, *Xen. Smp.* 5.6, *Pl. Prt.* 329d6, *Hp. Epid.* 2.1.7, *Aph.* 4.49, *Art.* 39.

ὑπορρίνιον: *part below the nose*, **pr.** *Hp. Acut. (Sp.)* 10; cf. *Ruf. Onom.* 41: τὸ δὲ ὄλον μετὰ τὸν ῥίνα τοῦ ἄνω χείλους.

ῥινός: *skin*, **ep.** *Il.* 5.308, *Od.* 5.426 (elsewhere *animal hide*, e.g. *Il.* 10.334, *Pi. I.* 5/6.37). **43 n. 66, 78 n. 41.**

Σ

σάρξ: *flesh*, **ep.** *Il.* 13.832, *Od.* 11.219, *Hes. Th.* 538; **dr.** *A. Ag.* 72, *S. Ph.* 1157, *E. HF* 1151, *Ar. fr.* 1 K.-A.; **pr.** *Hdt.* 2.87, *Xen. Eq.* 4.5, *Pl. Grg.* 518c7, *Hp. Aër.* 10, *Aff.* 47, *Loc. Hom.* 10. **37, 44-46, 83, 110, 115, 231, 236, 246.**

σήραγγες: *pores of the lungs* (lit. *hollow rock*, e.g. *Pl. Phd.* 110a5), **pr.** *Pl. Ti.* 70c6; cf. [*Hp.*] *Ep.* 23.

σιαγών, σιηγών: *jaw bone*, **dr.** *A. fr.* 281 *Radt.*, *S. fr.* 112 *Radt.*, *Ar. fr.* 300 K.-A.; **pr.** *Xen. Eq.* 1.8, *Pl. Ti.* 75d3, *Hp. Morb.* 2.26, *Epid.* 3.3.17, *Coac.* 491, *Arist. HA* 516a25.

σιηγόνιον: *the area under the jaw*, **pr.** *Hp. Morb.* 2.27.

σκάφιον: *crown of the head* (lit. *small bowl*, e.g. *Thphr. CP* 4.16.3), **dr.** *Ar. fr.* 620 K.-A.

σκέλος: *leg*, **ep.** *Il.* 16.314; **lyr.** *Alc.* fr. 306(14), col.2.13; **dr.** [A.] *Pr.* 74, *S. El.* 753, *E. Ph.* 1400, *Ar. Ach.* 220; **pr.** *Hdt.* 2.76, *Xen. Cyr.* 8.3.13, *Pl. Phd.* 117b1, *Hp. Epid.* 1.3.13, *Art.* 10, *Carn.* 5. **33 n. 38, 247 n. 92.**

σπάθη: *broad rib* (lit. *any broad blade*, e.g. *A. Ch.* 232 [a weaving blade]), **pr.** *Hp. Gland.* 14; cf. *Poll.* 2.181: τὰ τῶν πλευρῶν ὀστᾶ σπάθαι. **95.**

σπλάγχνα: *viscera*, **ep.** *Il.* 1.464, *Od.* 2.426, *Hes. fr.* 343 *West.*; **lyr.** *Pi. N.* 1.35; **dr.** *A. Eum.* 249, *S. Aj.* 995, *E. Or.* 1201, *Ar. Ra.* 1006; *Hdt.* 2.87, *Pl. Ti.* 72c2, *Hp. VM* 10, *Mul.* 37, *Epid.* 6.2.2. **53, 56, 84-85, 94, 115, 206, 231.**

σπλήν: *spleen*, **dr.** *Ar. Th.* 3; **pr.** *Hdt.* 2.47, *Pl. Ti.* 72c6, *Hp. VM* 22, *Epid.* 1.3.13, *Loc. Hom.* 3. **56, 98, 167, 206, 232.**

σπληνίτις: *splenetic vessel* (sc. φλέψ), **pr.** *Hp. Morb.* 1.26; cf. *Arist. HA* 512a29. **102-4, 111.**

σπόγγοι: *tonsils* (lit. *sponge*, e.g. *Od.* 1.111), **pr.** *Hp. Epid.* 4.7.

σπονδύλος: see σφονδύλος.

στεάρ: *fat*, **ep.** *Od.* 21.178; **pr.** *Hp. Morb.* 2.47, *Int.* 21, *Mul.* 79; cf. *Arist. HA* 511b9.

στέρνον: *breast, chest*, **ep.** *Il.* 4.106, *Od.* 5.346; **lyr.** *Pi. P.* 1.19; **dr.** *A. Ag.* 76, *S. Tr.* 1090, *E. Hec.* 424; **pr.** *Xen. Cyr.* 2.1.9, *Hp. Flat.* 10, *Loc. Hom.* 6, *Morb.* 2.20. **55, 61.**

στεφάνη: *eyeball* (lit. *anything that surrounds the head*, e.g. *Il.* 7.12 [a helmet's brim]), **pr.** [*Hp.*] *Vid.Ac.* 4.

στήθος: *breast*, **ep.** *Il.* 3.397, *Od.* 17.447, *Hes. Th.* 122; **lyr.** *Sapph.* fr. 158; **dr.** *A. Sept.* 865, *S. Tr.* 1076, *E. Or.* 1251, *Ar. Nu.* 1012; **pr.** *Hdt.* 2.106, *Th.* 2.49.3, *Xen. Mem.* 3.10.13, *Pl. Prt.* 352a5, *Hp. Epid.* 2.6.13, *Art.* 14, *Nat. Hom.* 12; *ball of the foot*, *Hp. Art.* 55, *Epid.* 4.1, 5.48. **61, 95.**

στόμα: *mouth*, **ep.** *Il.* 15.389, *Od.* 18.97, *Hes. Th.* 97; **lyr.** *Pi. P.* 9.87; **dr.** *A. Sept.* 579, *S. Tr.* 977, *E. Tr.* 695, *Ar. Th.* 511; **pr.** *Hdt.* 7.225, *Xen. Mem.* 1.4.12, *Pl. Tht.* 209b5, *Hp. Epid.* 2.1.7, *Aph.* 5.49, *Morb. Sacr.* 7; *orifice*, e.g. *Loc. Hom.* 47 (of the womb). **6, 41, 74.**

στόμαχος: *throat*, **ep.** *Il.* 3.292; **pr.** *Arist. HA* 496a2; *orifice of the stomach*, *Hp. Gland.* 11, *Carn.* 3, *Morb. Sacr.* 7; *orifice of the bladder*, *Hp. Aër.* 9; *mouth of the womb*, *Hp. Mul.* 238. **71 n. 15, 99.**

στρόφιγξ: *joint*, **dr.** *Pherecr.* fr. 270 K.-A., *Ar. Ra.* 892 (metaph. of the tongue); **pr.** *Pl. Ti.* 74b6.

συγκαμπή, ξυγκαμπή: *joint*, **pr.** *Xen. Eq.* 1.8, *Hp. Nat. Hom.* 11; cf. *Arist. HA* 513a3. **245.**

συναγωγεύς: *sphincter muscle* (lit. *one who brings together*, e.g. *Lys.* 12.43), **pr.** *Hp. Oss.* 14.

σῦριγξ: *duct / channel* (lit. *pipe*, e.g. *Il.* 18.526), **dr.** *S. Aj.* 1412; **pr.** *Hp. Int.* 1, *Morb.* 2.50, *Mul.* 78. **173-74.**

σφαγαί: *vessels of the throat* (lit. *slaughter*, e.g. *A. Eu.* 187), **dr.** *E. Or.* 291; **pr.** *Th.* 4.48.3 (but prob. sing. = *throat*), *Hp. Gland.* 4, *Int.* 18, *Mul.* 110. **172, 237.**

σφαγίτις: *vessel of the throat* (sc. φλέψ), **pr.** *Hp. Nat. Hom.* 11, *Coac.* 256, *Flat.* 256; cf. *Arist. HA* 512b20. **102, 110.**

σφονδύλος, σφονδύλιος, σπονδύλος: *vertebra*, **ep.** *Il.* 20.483; **dr.** *E. Ph.* 1413, *Pherecr.* fr. 28 K.-A., *Ar. V.* 1489; **pr.** *Pl. Ti.* 74a2, *Hp. Epid.* 2.2.24, *Art.* 41, *Loc. Hom.* 3. **141, 165, 208-9, 259.**

σφυρόν: *ankle*, **ep.** *Il.* 4.147; **lyr.** *Pi. I.* 7.13; **dr.** *E. IA* 225-26, *Ar. Ach.* 1179; **pr.** *Xen. HG* 5.4.58, *Hp. Fract.* 11, *Nat. Hom.* 11, *Epid.* 1.3.13. **107 n. 167, 189 n. 9, 198 n. 41, 242.**

σῶμα: *body*, **ep.** *Il.* 7.79, *Od.* 11.53, *Hes. Op.* 540; **lyr.** *Pi. O.* 6.56; **dr.** *A. Per.* 199, *S. Tr.* 1197, *E. El.* 428, *Ar. Av.* 1376; **pr.** *Hdt.* 1.32, *Th.* 6.15.4, *Xen. Mem.* 1.3.5, *Pl. Phd.* 64c6, *Hp. Aph.* 1.3, *Aff.* 25, *Flat.* 7. **35-39.**

σωφρονιστήρ: *wisdom tooth*, **pr.** *Hp. Carn.* 13.

T

ταρσός: *metatarsal bones, flat of the foot* (lit. *wickerwork*, e.g. *Od.* 9.219), **ep.** *Il.* 11.377; **pr.** *Hdt.* 9.37, *Hp. Prorrh.* 2.41, *Fract.* 9. **111, 154.**

τένων: *sinew / tendon*, **ep.** *Il.* 4.521, *Od.* 3.449, *Hes. Sc.* 419; **dr.** *A. Ch.* 209, *E. Ba.* 938; **pr.** *Hp. Art.* 1, *Loc. Hom.* 39, *Epid.* 5.83. **44.**

τεῦχος; *channel* (lit. *tool / implement*, e.g. *Il.* 6.340 [armour]), **pr.** *Hp. Carn.* 17, *Loc. Hom.* 1; *body* (as container), *Epid.* 6.2.1. **74.**

τιτθός: *nipple*, **dr.** *Ar. Th.* 640; **pr.** *Pl. R.* 373c2, *Hp. Epid.* 2.1.6, *Mul.* 71, *Aph.* 5.40.

(τιτθίον) **dr.** *A.* fr. 61.143 Radt, *Ar. Nu.* 412.

τόνος: *sinew / tendon / nerve* (lit. *cord*, e.g. *Hdt.* 9.118), **pr.** *Hp. Art.* 45, *Epid.* 2.4.2, *Gland.* 15.

τράχηλος: *neck*, **dr.** *E. Tr.* 362, *Ar. Eq.* 490; **pr.** *Hdt.* 2.40, *Xen. HG* 3.3.11, *Pl. Ti.* 75d1, *Hp. Epid.* 1.2.6, *VM* 23, *Morb.* 2.27. **75 n. 31, 204.**

Υ

ύμην: *membrane*, **pr.** *Hp. Nat. Puer.* 12, *Carn.* 9; cf. *Arist. HA* 495a8.

ὑπερώη: *palate*, **ep.** *Il.* 22.495; **pr.** *Hp. Morb.* 2.29, *Carn.* 16, *Gland.* 14.

ὑπόπιον: *part under the eye*, **ep.** *Il.* 12.463; **pr.** *Hp. Int.* 12, *Epid.* 7.7; *black eye*, **dr.** *Ar. V.* 1386.

ὑστέρα: *womb*, **pr.** *Pl. Ti.* 91c1, *Hp. VM* 22, *Mul.* 18, *Loc. Hom.* 46; cf. *Arist. HA* 493a25. **17 n. 57, 74, 110 n. 187.**

Φ

φάρυγξ: *throat, windpipe*, **ep.** *Od.* 9.373; **dr.** *E. Cyc.* 215, *Cratin.* fr. 198 K.-A.; **pr.** *Th.* 2.49.2, *Hp. VM* 19, *Epid.* 1.3.13, *Loc. Hom.* 14. **101 n. 135, 197, 238.**

φλέψ: *vessel*, **ep.** *Il.* 13.546; **dr.** *A.* fr. 230 *Radt*, *S. Ph.* 825, *E. Ion.* 1011, *Ar. Th.* 694; **pr.** *Xen. HG* 5.4.58, *Pl. Ti.* 66a3, *Hp. Aër.* 22, *Morb.* 1.28, *Flat.* 14. **101-4, 111, 168-73, 219-24, 242, 259, 263.**

φλέβιον (dim. of φλέψ, perhaps capillary or nerve), **pr.** *Pl. Ti.* 65c7, *Hp. VC* 1, *Morb.* 1.28, *Loc. Hom.* 2.; cf. *Arist. HA* 503b16. **263-64.**

φρένες: *midriff, heart* (seat of emotion), **ep.** *Il.* 19.125, *Od.* 4.120 (perhaps 'lungs' in Homer), *Hes. Op.* 55; **lyr.** *Pi. P.* 1.12; **dr.** *A. Eum.* 158, *S. Ant.* 603, *E. Hec.* 359, *Ar. Pl.* 581; **pr.** *Hdt.* 3.33, *Xen. Mem.* 2.6.1, *Pl. Ti.* 70a1. **51-56, 74, 106, 160, 167, 261.**

μετάφρενον: *broad of the back*, **ep.** *Il.* 12.428, *Od.* 8.528, *Hes. Sc.* 223; **lyr.** *Tyrt.* fr. 11; **pr.** *Pl. Prt.* 352a5, *Hp. Int.* 1, *Epid.* 7.96, *Morb.* 2.46. **56, 62.**

φύσκη: *large intestine* (of animals only, used in meat dish), **dr.** *Pherecr.* fr. 50 K.-A., *Ar. Eq.* 364.

X

χείλος: *lip*, **ep.** *Il.* 22.495, *Od.* 18.21; **lyr.** *Pi. P.* 9.63, **dr.** *S.* fr. 796 *Radt*, *E. Ba.* 621, *Ar. Nu.* 873; **pr.** *Hdt.* 9.112, *Xen. Smp.* 5.7, *Pl. Ti.* 75d6, *Hp. VM* 22, *Epid.* 3.2.5, *Aph.* 4.49. **40.**

χέλυς: *breast, chest* (lit. *tortoise shell*, e.g. *h.Merc.* 33), **dr.** *E. El.* 837; **pr.** [*Hp.*] *Anat.* 1. **164-67.**

χείρ: *hand, hand and arm*, **ep.** *Il.* 5.82, *Od.* 9.302, *Hes. Op.* 114; **lyr.** *Pi. O.* 7.65; **dr.** *A. Sept.* 680, *S. Aj.* 453, *E. Med.* 496, *Ar. Ach.* 1170; **pr.** *Hdt.* 4.62, *Th.* 4.25.4, *Xen. An.* 1.10.1, *Pl. Prt.* 352a4, *Hp. Coac.* 154, *Art.* 16, *Loc. Hom.* 3.

χιτών: *membrane* (lit. *chiton* [a type of garment], e.g. *Od.* 15.60), **pr.** *Hp. Carn.* 3 (general), *VM* 19 (of the eye), *Coac.* 275 (of the abdomen); cf. *Arist. HA* 557b16 (drum of the ear). **6, 100.**

χολάδες: *bowels / guts*, **ep.** *Il.* 4.526, *h.Merc.* 123; **pr.** *Arist. HA* 493a21 (sing. = *abdominal cavity*). **57-58, 73 n. 22.**

χόλικες: *bowels / guts*, **dr.** *Pherecr.* fr. 113 K.-A., *Ar. Nu.* 576.

χόνδρος: *gristle, cartilage* (lit. *granule / lump*, as of wheat or spelt, e.g. *Hdt.* 4.181), **pr.** *Hp. Art.* 35, *Loc. Hom.* 3, *Aph.* 7.28; cf. *Arist. HA* 517a4. **93.**

(χονδρίον) **pr.** *Hp. Carn.* 16, *Art.* 45, *Mochl.* 40.

ὑποχόνδριον: *the soft part(s) below the cartilage of the breastbone*, **pr.** *Hp. Prog.* 18, *Epid.* 1.3.13, *Flat.* 9. **92-93.**

χορδή: *gut* (as instrument string or sausage), **ep.** *Od.* 21.407, *Batr.* 222; **dr.** *Pherecr.* fr. 137 K.-A., *Ar. Ra.* 338; **pr.** *Pl. Phd.* 86e2, *Hp. Morb.* 2.35 (cord used as binding); cf. *Arist. HA* 581a20. **33 n. 40.**

χόριον: *caul, afterbirth*, **dr.** Ar. fr. 581 K.-A.; **pr.** Hp. *Mul.* 84, *Nat. Puer.* 16, *Nat. Mul.* 32; cf. Arist. *HA* 586a26.

χρώς, χρώα: *skin, flesh*, **ep.** *Il.* 21.568, *Od.* 16.145, Hes. *Op.* 416; **lyr.** *Pi. I.* 3/4.41; **dr.** A. fr. 83 Radt, *S. Tr.* 767, *E. Med.* 1075, *Ar. Lys.* 127; **pr.** *Xen. Smp.* 4.54, *Hp. Fract.* 25, *Mul.* 120, *Morb. Sacr.* 5. **42-44.**

Ψ

ψόα, ψύα: *loin muscle (psoas major / minor)*, **ep.** *Nosti* fr. 11; **dr.** Euphron fr. 7 K.-A.; **pr.** Hp. *Nat. Hom.* 11, *Art.* 45; cf. Arist. *HA* 512b21. **111, 214-19.**

Ω

ώλέκρανον: *point of the elbow*, **dr.** Ar. *Pax* 443 (ώλέκρανον); **pr.** Hp. *Epid.* 7.61; cf. Arist. 493b27.

ώλένη: *elbow, arm from the elbow downwards*, **ep.** *h.Merc.* 388; **dr.** [A.] *Pr.* 60, *S. Tr.* 926, *E. IT* 1158, *Ar. Ra.* 1322; **pr.** Hp. *Int.* 44. **75 n. 31.**

ώμος: *shoulder*, **ep.** *Il.* 6.510, *Od.* 18.68, Hes. *Sc.* 200; **lyr.** *Archil.* fr. 217; **dr.** *S. Tr.* 564, *E. Hipp.* 202, *Ar. Ra.* 30; **pr.** *Hdt.* 2.35, *Xen. Smp.* 2.20, *Pl. R.* 613c1, *Hp. Aff.* 22, *Art.* 2, *VM* 13.

άκρώμιον: *point of the shoulder (acromion process)*, **pr.** *Simon Atheniensis* 4, *Xen. Eq.* 1.11, *Hp. Art.* 3, *Coac.* 587; cf. Arist. *HA* 498b32. **245.**

έπωμίς: *point of the shoulder (at the collar bone)*, **pr.** *Xen. Mem.* 3.10.13, *Hp. Art.* 1, *Mochl.* 1; cf. Arist. *HA* 493a9 = *the back of the neck*: τὸ δ' ὀπίσθιον ἀυχένος μέρος έπωμίς.

ώμιαία: *shoulder vessel (sc. φλέψ)*, **pr.** Hp. *Loc. Hom.* 3. **102.**

ώμοπλάτη: *shoulder blade*, **pr.** *Xen. Eq.* 1.7, *Hp. Art.* 16, *Epid.* 2.3.4, *Morb.* 2.52. **85 n. 60, 245.**