Naming the Body: A Translation with Commentary and Interpretive Essays of Three Anatomical Works Attributed to Rufus of Ephesus

by

Carolyn J. Gersh

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Doctoral Committee:

Professor Sara L. Ahbel-Rappe, Chair
Professor David S. Potter
Professor Peter A. Railton
Associate Professor Arthur Mfw Verhoogt

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Introduction

It is an obvious problem in ancient medicine that the surviving record from imperial physicians is patchy. We have a large corpus by Galen; some material from Soranus; and bits and pieces that have been transmitted in the later compilations. In this light, Rufus of Ephesus (fl. late 1st century CE) provides another, often overlooked, source. Though he has the misfortune of being cast in the shadows of both Galen and Soranus, the other Ephesian doctor, Rufus was a prolific teacher, anatomist, pharmacologist, and physician in his own right. He had Galen's respect, and his popularity extended well into the Middle Ages.[1] Rufus' own medical contributions are many and wide-ranging: He is credited with discovering optic nerve fibers on the ventral surface of the brain as well as previously unknown blood vessels in the uterus. He is also particularly detailed in describing the muscles of the leg, including the gastrocnemius, soleus, and psoas. His writings span general anatomy; anatomical nomenclature; regimen; conditions of the blood and pulse; diseases of the bladder and kidney; satyriasis and gonorrhea; joints; acute and chronic diseases; fevers; gynecology; ulcers and tumors; urine; pharmacology; and melancholy. This project will focus specifically on Rufus' anatomical works, providing translations and commentaries of the texts as well as interpretive essays on the material.

[1] For Galen's comments on Rufus, see Galen V.105 and XVI.636.

Rufus' longest anatomical work, and the one on which I shall primarily concentrate is his *Names of the Parts of the Body* (*Onom.*). However, for the sake of completeness, I have also included translations of the other anatomical treatises attributed to him, *On the Anatomy of the Parts of the Body* (*Anat.*) and *On the Names of the Bones of Man* (*Ost.*). The latter two are largely derivative of the *Onom*, and it is unclear whether Rufus himself authored them. Daremberg includes both these in his addition, though he lists them simply as "attributed to Rufus." Ruelle, in his introduction to the Daremberg edition, says the *Anat*, at the very least, may have undergone some reworking in the Byzantine period.[2]

Nonetheless, there are reasons for viewing Rufus' works on nomenclature as interconnected. The opening of *Anat.* refers back to another work, one about the external parts. And similarly, *Ost.* refers to a work about the internal parts, though of course, these cross-references could easily have been added to make the works seem genuine. And beyond that, it is patently not the cases that *Ost.* deals solely with external parts nor that *Anat.* deals exclusively with internal ones. But thematically, these works are, generally, in agreement. Both discuss in detail the ocular membranes (*Onom.* 154.1 and *Anat.* 176.9) and the spermatic vessels (*Onom.* 1558.15 and *Anat.* 176.9). The differences between the blood vessels in these works are few and minor.

Despite being topically anatomical, these texts reveal much about Rufus' cultural biases; social limitations; and views about humanness, writ large. And these matters are the subject of the essays which follow my textual translations. Rufus' overarching project in his anatomical works is actually two-fold: he aims to (1) pinpoint the parts of the human body and (2) provide names for these parts. Of course, Rufus cannot discuss the

[2] Ruelle (1879), xxviii.

parts of the human body without first establishing what constitutes a human. And in the first essay, I explore his definition of humanness. The short explanation is that for Rufus, what is human is what is like him: male, Greek, free-born, healthy, mature but not old, and distinct from other animal species. Nonetheless, limitations of Rufus' setting, particularly prohibitions against human dissection prevent him from analyzing models that fit his ideal. To showcase the external parts of the body, Rufus must use a slave. And for the internal parts, he must use a monkey cadaver. Yet I argue that these limitations, however frustrating for Rufus, highlight his distinctions between the ideal and the imperfect human.

The second essay continues this discussion of Rufus' cultural, national, and speciesist prejudices, but investigates them on the linguistic level. That is to say, the words that Rufus selects to label the body ought to be Attic Greek. Non-Greek words, on the other hand, are to be avoided. In this section, I also discuss Rufus' extensive use of metaphors. When faced with a body part that is as-yet unnamed, Rufus tends to re-use the name of another part. The human body -- particularly its most "human" parts -- gets multiply mapped onto itself, underscoring its fundamentality.

The final essay looks at the performative aspects of Rufus' presentation. Rufus' *Onom.* is delivered before an audience, in a lecture format. He uses props and points to his models using deictic forms. In many ways, then, Rufus prefigures Galen and should count as an early participant in the Second Sophistic movement. That said, I argue that Rufus is reserved in his showmanship. He is not aggressively polemical, and he never develops a strong authorial presence. Moreover, Rufus separates himself from the iatrosophists in lacking an obvious Roman connection. There is no evidence that he ever

travelled to Rome or sought imperial patronage. The sophistic elements that come to the fore in his texts seem to be less a pointed effort and more a natural result of the format of his presentation. Nonetheless, his performance still offers information about methods of presenting medical knowledge.

Scholarship

In terms of the scholarship on Rufus, in 1879, Ruelle and Daremberg edited Rufus' extant Greek works and well as the Latin version of his *Joints and Diseases*. And in 1930, Ilberg wrote a monograph on Rufus, focusing on his fragments in Oribasius. There is little in this monograph on Rufus' fragments in Aetius and none on his fragments in Paul. On the Arabic side, in the 1970s, Ullmann and Sezgin catalogued a large number of Arabic medical texts. And both Sezgin's *Geschichte des Arabischen Schriftums* and Ullmann's *Die Medizin im Islam* compare Rufus' Greek and Arabic fragments. And beyond that, we also have Geofrey Lloyd's more general text *Science, Folklore, and Ideology*, which offers an overview of Rufus' works. Rufus' anatomical texts say little about the physician's interactions with his patients. So for this, we need to turn to Rufus' *Medical Questions*, edited by Hans Gärtner in the C.M.G. text. In this work Rufus details hindrances to communication with patients: delirium, weakness, old age, youth, and language barriers. There is nothing in any of Rufus' works on the use of pulse diagnosis.

Rufus' Name and Date

Establishing Rufus' dates is an inexact process. According to John Tzetzes,[3] Rufus practiced during the time of Cleopatra, acting as her personal physician. Galen locates him, generally, among his modern predecessors.[4] And in the Suda, Rufus is placed under Trajan (98-117).[5] Leclerc thinks he belongs to the start of the 2nd century CE, as do Gurlt, Neuburger, and Diepgen. However, Haeser, Gossen, and Ullmann suggest he is not before the second half of the 1st century.[6] William Greenhill, in his *Dictionary of Greek and Roman Biography and Mythology*, notes that Rufus quotes Zeuxis and Dioscorides and was, himself, quoted by Galen.[7] In any event, Rufus wrote somewhere between the end of the 1st century CE or at the start of the 2nd. Rufus himself offers little by way of datable references. The only personal name is Potamius, the dedicatee of *On Vomiting*, but we know nothing about this individual.

As for Rufus' name, Galen mentions an individual who might be different from Rufus of Ephesus. In volume XIII p. 1010, he speaks of a Menius Rufus. But in XIII, p.92 and XIV p. 119, we see simply "Rufus." Likewise, in the *Bibliotheca Graeca*, Fabricius says that Menius Rufus is a different person from "Rufus."[8] Rufus himself never mentions his birth place or home town, though ancient sources place him in Ephesus. Rufus' works betray a strong interest in Egypt, especially its geography, ethnology, anatomical and pathological terms. He names a pediatric disease as an "Egyptian ulcer, for instance"[9]

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[3] Chil. VI**.** *Hist*.44.300.
[4] Galen. V.105 and XVII B.956.
[5] *Suidae Lexicon* (1935) ed. Adler, pars IV. Leipzig, 301.
[6] Haeser (1878), 336; Gossen (PW.A1, col.1208); Ullmann (1921), 7.
[7] Greenhill (1880), 668. See also Wellmann (1921), 4, who notes that Rufus quotes Dioscorides and is quoted by Archigenes.
[8] Vol. III, Hamburg 1710, 104. Ackermann agrees with this view (vol. IV, 1795, 714).
[9] Oribasius, *Coll. Med.* Lib 43, 180.

And he notes that doctors in Egypt speak Greek badly, so he has at least some familiarity with Egyptian practices.

Von Staden gives two testimonia from Vindicianus saying that Rufus practiced in Alexandria; however, Von Staden suggests that Rufus only visited Egypt and never actually resides there.[10] In terms of his patients, Rufus mentions individuals from Ephesus, Miletus, and Magnesia, though, of course, this should not imply that Rufus necessarily spent time in any of these places. Athenians held a high place in Rufus' list of trustworthy physicians; and he cites them three times in his anatomical works.

Sources

In terms of the specific development of Greek anatomical terminology, relevant anatomical texts besides Rufus' include those of the Hippocratic Corpus, Aristotle, and fragmentary remains of Herophilus and Erasistratus. In many ways, Rufus represents a synthesis of Hippocratic and Hellenistic traditions. So it will be useful to run through some of these early sources, as there was a strong belief among Greek and Roman doctors that the past history of medicine was of direct relevance.

The study of the medical thought of predecessors relied on a range of secondary literature – catalogues of names, doctrines, biographies, lexica, and commentaries; there were many genres of medico-historiographical writing. In the first place, are the Lives; but of these, we have quite little. In the Methodist school, biographies of Hippocrates survive in Byzantine compilations, including the Suda and *Chiliades* of John Tzetzes. And we also have letters supposedly composed by Hippocrates, Herophilus, and

[10] Von Staden (1989), 189.

Diocles.[11] Specific literature on the various schools (Dogmatists, Empiricists, Herophileans, Erasistrateans, etc.) was a combination of biography and doxography. Early Greek medicine was believed to have divided into Coan, Cnidian, and Sicilian Schools.[12]

As for *technai*, we have, for example, Celsus' *De Medicina*, which is only part of a work dealing with many of the sciences. *Quaestiones* and *Definitiones* provide synopses of the main topics of investigation. Here we have the Pseudo-Galenic *Definitiones Medicae*, the Pseudo-Soranic *Quaestiones Medicales*, and the *Medicinales Responsiones* of Caelius Aurelianus. Yet another category consists of medical literary history, lexicography, etymology, and commentaries. These started in the early Hellenistic period, especially among the Empiricists and Herophileans. Only fragments are extant, though we do have Erotian's *Dictionary of Hippocratic Terms.* Lastly, we have encyclopedic writings. Key authors for this category include Pliny, Celsus, Oribasius, Aetius of Amida, and Paul of Aegina. For Celsus and Pliny, medicine was just one among the many sciences, and it constituted secondary literature. The earliest surviving attempt at a comprehensive history of medicine was Aulus Cornelius Celsus' prooemium to his *De Medicina*. He explains that while post-Hippocratic physicians did make important advances, the Hippocratics were most worth remembering. The proem 12-75 of this work says that the youngest branch of medicine, regimen (treating diseases) must be dealt with first.

[11] WD Smith (1990), 1.
[12] Ibid, (1973) 560-85.

In terms of the specific medical writers cited by Rufus, Hippocrates and Herophilus are the most frequently noted. The complete list of authors and sections of the *Onom.* where Rufus cites them is as follows:

Διονύσιος: 205

Ἐπίχαρμος: 79

Εὔδημος: 143

Εὐρυφῶν: 112

Ζήνων: 228

Ἡρόφιλος: 123, 150, 153, 155, 203

Ἱπποκράτης: 33, 77, 88, 120, 155, 194, 195, 202

Κλείταρχος: 192

Πραξαγόρας: 199, 226

Φιλιστίων: 201

Biographical information on these authors will be provided in the commentary which follows.

Anatomical Texts before Rufus

A quick glance at some early anatomical texts reveals that there was a rich tradition prior to Rufus. First we have the fragmentary *De Corporum Resectione*, which provides a cursory account of the trachea, lung, heart, liver, superior vena cava, kidneys, ureters, bladder, esophagus, diaphragm, stomach, and spleen.[13] Of particular interest to Rufus' texts, in this work, the spleen is described as having the same shape as the sole of

[13] Littre, VIII, 538-41.

the foot. Also in this text, the human heart is said to be rounder than that of other animals, something which Rufus, too, reports. A longer anatomical account is *De Corde*, which was written perhaps as late as the time of Erasistratus. In this work, the author describes the valves of the heart, though he wrongly suggests that swallowed fluid travels through the lungs. This idea finds support in Plato,[14] but is refuted by Aristotle.[15] And lastly, in *De Articulis,* we find the first discussion of individual muscles. Moreover, these muscles are described in a manner that suggests they had previously been named: "muscles called temporal" and "muscles called masseters."[16] Rufus adopts both of these terms.

Other major influences on Rufus were the Peripatetic authors, particularly Aristotle. As a dissector of animals, Aristotle could provide detailed comparative anatomy:

> Ἄγνωστα γάρ ἐστι μάλιστα τὰ τῶν ἀνθρώπων, ὥστε δεῖ πρὸς τὰ τῶν ἄλλων μόρια ζῴων ἀνάγοντας σκοπεῖν, οἷς ἔχει παραπλησίαν τὴν φύσιν
>
> Best known are man's external parts, but it is just the opposite as far as the internal parts are concerned. For least known of all things is the structure of men's bodies, so that it is necessary to consider the individual parts, comparing them to the parts of other animals which they resemble by nature. (*HA.* 494b22-4)

Rufus certainly drew from Aristotle's discussion of the blood vessels. Aristotle, however, had a self-professed difficulty in tracing the course of blood vessels; in living creatures, these vessels are hidden within the body, and in dead creatures, the vessels would have collapsed. He did, however, note that strangulation, rather than throat-cutting, would better preserve the integrity of the vessels.

For Aristotle, the word "veins" implied our modern notion of both arteries and veins, though the aorta did receive its own name. He claimed that all vessels emerge from the

[14] Plato.*Tim.* 70.
[15] Aristotle, *PA.* III.3.664b2-a26.
[16] Littre, IV, 140, 141.

heart, and that bones, like blood vessels, comprise a continuous system. As mentioned above, Aristotle was a careful observer of animals, and much of his discussion of human viscera is comparative in nature. He describes the four stomachs of ruminants,[17] the proventriculus of birds,[18] and animals lacking gall bladders.[19] I shall cover Aristotle's influence on Rufus, particularly his *Historia Animalium*, in greater depth in my discussion of definitions of humanness.

Turning to another influential Peripatetic anatomist, we have Diocles of Carystos, a younger contemporary of Aristotle, belonging to the Dogmatic school. He was also known as the "second Hippocrates," and Wellmann (1901) has collected all of his fragments. Diocles wrote the first manual of dissection, based primarily on animals, but also he referenced human abortuses. According to Galen, he was the first to use the term "horns" to describe the uterus.[20] And Rufus adopts this term. Like many of his predecessors, he did not distinguish between arteries and veins. This distinction was made by Praxagoras of Cos, a pupil of Diocles and later head of the Dogmatic school.[21] Nonetheless, Praxagoras thought that only veins contain blood; arteries were exclusively filled with pneuma. He also argued that as an artery divides, its lumen becomes smaller and disappears entirely; in this way, arteries become nerves.[22]
On the neurological front, he argued that the brain was an outgrowth of the spinal cord.[23]

The Hippocratic tradition is one of the most fundamental to an understanding of Rufus, and what particularly links Rufus' works to the Hippocratic corpus is his

[17] Aristotle, *HA.* II. 17. 507a34.
[18] Aristotle. *PA.* III. 14.674b17-28.
[19] Aristotle. *HA.*II.15, 506a20-b24.
[20] Galen, *De Anat.Admin.* II.1).
[21] For more on Praxagoras and the Dogmatic school, see Portal (1770), 44-5 and Hirsch (1886), IV, 623.
[22] Galen, *De Plac. Hipp. Et Plato*, I.6).
[23] Ibid. 8-12.

invocation of the bodily humors. In *De Vetere Medicine* 22.1, the bodily humors are described in terms of taste: bitter, salty, astringent and acidic. The fullest Hippocratic treatments of these elements are in *Humors* I and the *Nature of Man.* In the former, the author explains that the humors appear more concentrated during certain season. In the fall, for instance, an individual is more likely to experience jaundice. Indeed, the author even suggests that it might be possible to forecast the weather from the prevalence of certain diseases. And in *Nature of Man* IV, the author explains that the body of man has blood, phlegm, yellow bile, and black bile. Viewed in combination, these constitute the nature of his body.

The Hippocratic term "*chumoi"* implies "juices," especially those of plants.[24] Together with the flavors, this explains, at least to some extent, the emphasis on eating in medical texts.[25] Various tastes are ascribed to Democritus by Theophrastus: bitter (*pikros*), salty (*halmuros*), astringent (*struphuos*), and acidic (*oxus*).[26] Plato's *Theaetetus* likewise describes the humors as tastes.[27] Rufus likewise defines blood as a *chumos*. Phlegm is white, thick, and salty. Bile is of four types: yellow, green/yellow, green, and black. He calls them "*perissoma*" along with saliva, mucus, sweat, urine, gas, ear wax, menses, milk, and sperm. Pseudo-Aristotle does not include saliva and ear wax but does include blood and feces.[28]

Besides taste, *Epidemics* I.2.696 uses colors to describe the humors, a phenomenon we find, too, in Rufus. It should be noted that Aristotle's discussion of the humors diverges somewhat. In his corpus, the principle word for humor is *hugrun*

[24] *Epid.*6.6.3.
[25]Cf Damoxenes DK 68A43 and 119.
[26] DK 68A43 and 119.
[27] Plato.*Theat.*166e-67d.
[28] Pseud-Arist.*Problems.*916b1-917a22.

("fluid"), and it has little in common with the Hippocratic texts. In the *History of Animals*, for example, these fluids are specified as blood, ichor, lard, marrow, semen, gall, milk, and urine.[29] But phlegm and bile were not included.

As mentioned above, it is a commonplace in Hippocratic texts that the humors are produced from food. This connection holds true in Rufus' works as well. Cheese induces phlegm in adults, and milk produces it in babies, for instance.[30] One should vomit to rid oneself of phlegm if sour milk has been imbibed, and thyme can be used to get rid of excess bile.[31] Humoral imbalances result from ingesting (too much) improper food, but they can also be systemic and endemic. If humors are present when they should not, the attending physician should suspect epilepsy, indigestion, or other ailments.

In terms of disease, Rufus' treatment of imbalanced humors is also based heavily on the Hippocratic tradition. In *Affectations* I, the author argues that all diseases are caused by a build-up of bile or phlegm, specifically when these elements get too dry, wet, hot, or cold. And in *Diseases* I.2, we find the same point. The presence of blood, black bile, yellow bile, and phlegm vary according to the seasons. Blood predominates in the spring; black bile, in the fall; yellow bile, in the summer; and phlegm, in the winter. For this reason, not only should prognosis involve examination of the face, eyes, stool, urine, and vomit, but it should also involve inquiry into the patient's diet and environment.

However, Rufus stresses that humoral treatment must depend on an individual's unique biological make-up. For example, he notes that because some patients have stomachs which are inclined more upwards, physicians should avoid giving them

[29] Arist.*HA*.1.1.487a-210.
[30] Orib.*Coll.Med.lib.inc.*13.125.17-18.
[31] Ibid.4.38.

purgatives.[32] And similarly, if the orifice of the colon is small, physicians should be careful in giving purgatives.[33] And in Aetius of Amida XVI.50, which is attributed to Rufus, suggests that amenorrhea when caused by an imperforated membrane at the neck of the uterus responds worse to purgatives than amenorrhea caused by environmental factors. Put simply, there are external and internal causes of disease: When a large number of people share the same disease at the same time, there is, most likely, an external cause. But if an individual has unique symptoms, his illness results from his individual regimen – namely, his diet and exercise.

There are, of course, humoral alternatives. Athenaeus, the reputed founder of Pneumatism, favored a mix of Stoicism and Hippocratism. Followers included Claudius Agathinus and Archigenes of Apamea. In particular, the pneumatists rejected the atomism of Asclepiades in favor of hot, cold, wet, and dry elements held together by pneuma. Here there are parallels between the macrocosm of the universe and the microcosm of the body. Just as the body cannot survive without pneuma, such is the case with the universe writ large.

The Hippocratic and earlier traditions are also important for what they say about pneuma and respiration, and these accounts need to be examined before turning to Rufus. According to Athenaeus and the Stoic school, disease derives from a *duscrasis,* which harms the pneuma. And even before the pneumatics, pneuma was discussed as a cause of disease in the Hippocratic *Breaths*. The author defines air outside the body as *aer* and within the body as *phusa* (3). So before turning to Rufus, it is worth taking a closer look at the Hippocratic and earlier traditions.

[32] Ibid.7.26.
[33] Ibid.7.28.

In his "Air, Pneuma, and Thivel describes three stages in ancient thinking about respiration: the archaic, the Empodoclean, and the Aristotelian (including Diogenes of Apollonia, Philistion, Anaxagoras, Democritus, and Diocles), all three of which are present within the Hippocratic corpus. Thivel explains that in the first period, air is considered a material substance, and if it seeps into the body, disease will result. In the second period, air and blood become a source of life. And in the third period, the lungs become the organ of respiration; here, air is not needed for breath; rather, it functions as a coolant for the heat of the heart.

Thivel explains that in the archaic period, an object has to be visible to be considered real. *"Avapneo"* in Homer did not involve the lungs, but was instead a pause in motion.[34] The materiality of air is described in several treatises within the Hippocratic corpus and in "Cnidian" works. *On Diseases* II.33 explains that a patient with a nasal polyp expels air, though this does not engage the lungs. Similarly, the condition of orthpnoea necessitates a seated position for breathing, but, again, does not involve the lungs. The lungs are spongy in texture and absorb water, not air.[35] For if they were to take in liquid, they could not, at the same time, take in air, Indeed, the etymology of *pleumon* (the ancient term for "lung") is related to the Indo-European root *plew-, "to float."[36] *On Diseases* II.59 describes a condition whereby if we have too much air in the body, the lung collapses along the sides, and the doctor must drive the excess air out of the lungs with a bladder. Likewise, *On Ancient Medicine.*22 suggests that if air enters the body, pockets can form in the lungs, spleen, and breast. In Thivel's second period, during the

[34] See, for example, *Iliad* XI.382, XI.800, XV.235, and XVI.301.
[35] See Plutarch;s *Symp.*7.1: we "moisten our lungs with wine."
[36] Thivel ,239.

5th century BCE, two discoveries were notable: (1) that air was invisible and (2) that the heart had a central place in the network of blood vessels.

Empedocles notes that the surface of the skin contains millions of pores which are in contact with the blood vessels. In this way, external air could enter the body through these holes and would mix with the blood and humors.[37] Life is a mixture of air and blood. However, the lungs were not involved, and breathing took place within the whole body. The verbs *anapneo* and *ekpneo* were commonplace, but involved the body, writ large. Lastly, Thivel's third period, in the middle of the 4th century, proposed that the lungs were like bellows and played a key role in respiration. Aristotle's *On Respiration* is an important influence here. *On Nutriment* 29 suggests that the lungs attract a nutriment (air) which is opposed to the food in the body. And in section 48, the author notes that there exists "throbbing of the vessels and breathing of the lung, for air is also a nutriment." *On the Nature of Bones* 13 explains that the lung "receives a little blood but much breath and is spongy."

Turning next to Rufus, in his *Onom.* 222-3, he defines *phusa* as a perissoma and surplus of pneuma. However, he also says that physicians define pneuma as that which we breathe (288). He notes that some think breath goes from the nostrils to the brain (136) – "some" here referring to Coan doctors. According to Rufus, there is air in both cavities of the heart, though one has more (*pneumatike*); the other, the *haimatike* has more blood (*Anat*. 32). This air goes through the arteries from the heart to the rest of the body. When the heart takes in air from the lungs, it contracts so as to fill the arteries.[38] In phrenitis, air moves constantly because of the sleeplessness of the patient, so the pulse

[37] DK 31 B 100.
[38] Wellman (1901), 77 says the Coan school differs from the Sicilian in saying that pneuma arrives first to the head and then the rest of the body, while in the Sicilian school the heart is primary.

becomes short. In fevers, the diastole is longer than the systole because of the passage of air. In women with angina, increased breathing indicates improvement of the condition. The head naturally receives vapors because it has wide channels. In melancholy, the stomach becomes dry because air goes from the hypochondrium instead of to the stomach.

As a brief addendum to the humoral and Hippocratic origins of disease as they manifest themselves in Rufus, it is worth mentioning another element, water. According to Rufus, water is the cause of lithiasis (marsh water)[39] And in his *On Diseases of the Kidneys and Bladder*, heat acting on a cold bladder will dry up sediment and cause stones (117). Rufus further explains that men get urinary diseases more than women, since women have a shorter and wider urethra (8-10).[40]

But perhaps the greatest impact of Hippocratic (and humoral) medicine on Rufus appears not in his works on anatomical nomenclature, but in his discussion of mental illness, particularly melancholy. For this, Peter Pormann's edition is a useful source. Rufus' treatise suggests that the root of psychiatric illness is also humoral in origin, as it is caused by an excess of black, or melancholic, bile. Rufus urges that there are somatic symptoms of melancholy: an affected individual cannot open his eyes, he has thick lips, and his skin assumes a flushed appearance.[41] Though Rufus argues that the cause of melancholy is humoral, he also notes that too much of certain sorts of mental activity can contribute. In particular, he warns against performing too many geometrical calculations.

In terms of the specifics, Rufus focuses on the hypochondriac type of melancholy, whose origin is in the region below the rib cartilage (F4, F5, F6, F7), though in F11, he

[39] Orib. *Coll. Med.* V.3, frag. 66.
[40] Cf. Soranus I.5 where women's bladders are described as larger and as having straighter necks.
[41] *Quaest.Med.*4.

mentions a type where the brain is affected. In Galen, we find three types of melancholy: (1) hypochondriac, (2) encephalic, and (3) systemic.[42] Helmut Flasher argues that Galen's categories derive from Rufus.[43]

Melancholy results though imbalances in one's diet and humors (F11.22) or, occasionally, through too much thinking (FF 34-6). Indeed, in F68.3, Rufus specifically mentions too much contemplation of geometry. The illness starts in the hypochondria (6.1) and is caused by swelling of the portal veins of the liver (7.1). In 8.1, Rufus notes that the head is linked to the stomach. The esophagus originates in the head, and large nerves travel from the head to the esophagus and stomach. This is why a blow to the head can induce vomiting. As for symptoms, Rufus notes that the eyes of melancholics are rigid; their lips are thick; and they have a dark complexion (F14.2). Men tend to suffer more than women, and among men, boys and castrates are the least affected (F18.1). To alleviate symptom, sexual intercourse is encouraged (F58.1); as proof, Rufus explains that wild animals are calmer after mating (F59.3).

Central to an understanding of Rufus' texts is a discussion of how they are informed by the Alexandrian tradition. The greatest Alexandrians were Herophilus, Erasistratus, and Eudemus, and all held clear sway over Rufus. What is particularly relevant to Rufus' anatomical texts is his interest in the Alexandrian practice of performing dissections on humans. This tradition disappeared by the first century CE, with a change of intellectual and political climate in Rome, a fact which Rufus regrets. Galen says of Herophilus that "he was deeply learned in all other branches of the medical art, but he had also arrived at a most accurate knowledge of what is to be learned by dissection, and for the most part,

[42] *On the Affected Parts* 3.9-10.
[43] Flasher (1966).

he gained his knowledge not from irrational animals, as most men do, but from human beings."[44] According to Celsus, the Alexandrians even performed vivisection on humans:[45]

Whether Herophilus performed vivisection is unclear, and Galen mentions him only as a dissector (T54, T67-70, T107). Celsus says Herophilus and Erasistratus both performed vivisection. Diodorus of Sicily, the first century BCE historian, in his account of Egyptian history says the *paraschistes*, the person who anatomizes corpses to prepare them for embalming, was vilified. Indeed, he often had to flee because Egyptians "assumed every person who applied force to a body of someone of the same race (*homophylos*) and wounded it was polluted."[46] It is worth noting, however, that in Herodotus' account of embalming in Egypt (2.86), mummification was viewed as different from scientific dissection. For embalmers drained to brain through the nostrils, and parts were no longer recognized anatomically.

It is not to say that Alexandrian anatomy was based exclusively upon human dissection; comparative anatomy continued to play a large role. Indeed, at several locations, Herophilus compares human organs to those of animals. In fragment 60, for instance, Herophilus notes similarities between the hare and other animals. And we also have Galen's statement in fragment 61 that Herophilus described the "testicles" (ovaries) in various female animals.

Turning specifically to Herophilus' treatise on anatomy (T60-129), three fragments are preserved. They are particularly detailed about the brain and nerves.

[44] Galen. *De Uteri Dissectione*, cap.5. [Kuhn, II, 895].
[45] Celsus. *De Medicina. Proemium*, 23-24.
[46] Diod.Sic. 1.91.1-4.

Previously, which is to say, in the Hippocratic and Peripatetic traditions, neurology had not advanced that far. There was no real distinction between nerves, ligaments, and tendons; all were subsumed under the heading "sinews." But with the Alexandrians, particularly Herophilus, came major neurological advances, many of which Rufus references. For a summary of Herophilus' accomplishments, Dobson's (1925) account is a rich source. But among these accomplishments, Herophilus made the brain, rather than the heart, the most important center of activity. He knew of the cerebrum, cerebellum, meninges, and ventricles (both torcular meninges and choroid plexuses).[47] And further, he distinguished between motor and sensory nerves, detailed seven pairs of cranial nerves, calling their lumen "*poroi*."[48]

To be sure, the patho-physiological significance of the brain was recognized early in the fifth century BCE by Alcmeon of Croton (24A5 DK), where a connection of the brain and optic nerve was noted. This was reconfirmed by Democritus (68A105DK) and Diogenes of Apollonia (64A19DK). But Aristotle failed to recognize the physiological function of the brain; he thought of it as a refrigerator of sorts, which served to counteract the heat of the blood (*De Sensu* 5.444a8-15). He also argued that it helped induce sleep (*De Somno* 3.456b17-28). Herophilus was also the first to describe the *calamus scriptorius* (T79), so-called because it resembles a reed pen. In terms of the nerves, Galen says that Herophilus and Eudemus (T80) were the first after Hippocrates to record the array of cranial nerves. In particular, he explains that Herophilus noted more than seven pairs of cranial nerves: the optic, oculomotor, trigeminal, motor root of the trigeminal, facial, auditory, and hypoglossal (T82).

[47] Galen. *De Anat. Admin*. IX.3.
[48] Ibid. VI.8.

Herophilus' work on the eye is particularly detailed, and Rufus draws upon his terminology of the ocular membranes. Herophilus identified four membranes of the eye: the sclera-cornea, iris, retina, and choroid (T86-89), likening the retina to a cobweb and the choroid, to grape skin. Rufus uses these same terms. He additionally named the "styloid process" for its resemblance to a pen (T90) and the "pharoid process" for its resemblance to the lighthouse on the island of Pharos (T92). Herophilus likewise describes the human liver with great accuracy. Of course, inspection of livers for divination was popular in Greece, Babylonia, Assyria, and Rome. But in these instances, it was the liver of sacrificial animals that tended to be viewed.[49] While the author of the Hippocratic *Nature of Bones* correctly says that the human liver has five lobes, he was relying on non-human specimens to make this claim.

In terms of reproductive anatomy, Herophilus identified ampullae of two vasa deferentia. And he called "varix-like" or "varicose assistants" (T101-103) what assists in transporting and producing seed.[50] He denies that women have these varicose assistants (T105), but he nonetheless describes ovaries as "twins" (*didumoi*, T109), the traditional word for "testicles" and explains that they "differ only a little from the 'testicles' of the male" (T109). And along the same lines, he refers to the Fallopian tubes as "spermatic ducts," stating that they arise "from each testicle (sc. ovary) into the fleshy neck of the bladder just like the male duct" (T109). Throughout Greek medical texts, there has been a quarrel about whether the head or heart is the center. In early theories, the head reigned supreme; but in the fourth century, the heart was favored. Aristotle says that three

[49] Stengel (1920), 6 and Mani (1959), 14-17.
[50] Cf. Galen, *De Semine* IV.582K.

scientists – Polybiusm Syennius, and Diogenes of Apollonia – argued that blood vessels emerged from the head.[51]

Lastly, it is worth mention Erasistratus, Herophilus' younger contemporary. He is often referred to as the founder of physiology, and his discoveries likely influenced Rufus' work. Erasistratus considered the heart to be the source of both veins and arteries.[52] Moreover, he added to the existing knowledge of cranial nerves, noting that they travel to the eyes, ears, nostrils, and tongue.[53] He also described the use of the epiglottis.[54] And lastly, it is worth mentioning Eudemus, another Alexandrian contemporary of Herophilus. Not much is known about him other than that Galen calls him a competent anatomist,[55] and says he wrote correctly about nerves.[56]

Early in the 3rd century BCE, there was much debate between the so-called Rationalists and Empiricists about the nature of medical knowledge. Also involved in this debate, which continued from the 1st century CE onwards, were the Methodists, who tried to find a position that avoided the problems and criticisms of the other two. Rationalists followed dogmatic philosophy, especially stoicism, while both the Empiricists and the Methodists followed philosophical skepticism. As background to this debate, in the 5th century, most doctors felt they needed some sort of overarching theory to govern their practices. But the question was whether they should adopt a philosophical theory of nature, in general, and humans, in particular or whether they needed their own specific medical theories. The Hippocratic *Nature of Man* is opposed to the former, suggesting

[51] Arist.*HA*.3.2b24.
[52] Galen. *De Plac. Hipp, and Plato*. VI.6.
[53] Ibid. VII.3.
[54] Aul. Gell. NA.XVII.xi.1-5.
[55] Galen. Hippocratis *de Natura Hominis liber at Galeni in eum commentarius*, II.6.
[56] Galen. *De Locus Affectis*. III.14.

that global philosophical theories were not specific enough to cover physiological needs. In the 4th and 3rd centuries BCE, there were huge improvements to medical theory, especially under Diocles, Praxagoras, Herophilus, and Erasistratus. Diocles in partiular warned against accounts being too theoretical.[57] Nonetheless, there was some sense that the principles of human health could be grasped by reason.

Despite these initial rumblings, the debate between the various schools really took flight in the beginning of the 3rd century CE. In the Empiricist school, doctors explained that knowledge depends on experience, not the theoretical study of entities like pores, atoms, and essences. Empiricists criticized other doctors for trusting too much in reason and aptly called them "Rationalists." Yet Rationalists countered that experience alone does not constitute the art of medicine. Erastistratus and Herophilus argued against the position that medicine is a matter of experience.[58]

Plato and Aristotle rejected the idea that any art or science could be a matter of mere experience. For them, it needs to be based on general knowledge, which is a matter of reason. Experience gives only facts, not explanations, and it leaves doctors ill-prepared to handle unusual cases. Reason, on the other hand, should at least offer physicians the possibility of grappling with them. Asclepiades attacked the Empiricist position, and in his view, diseases were not due to the humors, but to a disruption of the flow of atoms through pores. The Methodists, the third party in this debate, generalized Asclepiades' view to say that diseases are due to the constriction and dilation of pores. Whereas Asclepiades said these were hidden states, the Methodists argued they would be visible to a trained doctor. In this way, the Methodists agreed with the Empiricists that (traces of)

[57] Galen, Kühn VI, p.455.
[58] Galen.*De Sect.ingred.*5 SM III, p.9, 15. See also Pliny, *HN.* 29,5,6.

diseases should be observable. Yet they argued that experience itself cannot guarantee repeatability.

So where does Rufus fit into this debate? Because he divulges so little about his own life, and because he is not particularly polemical, Rufus is difficult to pigeon-hole into any school. It is clear that he was learned, thorough in his research, and concise in his presentation. But Rufus does not join a side – at least, not in any sort of emphatic way. While Methodism was successful in Rome, Rufus never discusses the guidelines of Methodism. Nor does he detail Empiricist enquiry. He seems to favor Hippocratic medicine and his works are, at times, tinged with Aristotelian elements, but he is in no way a major player in this debate.

Chapter 1

Greek Text of Rufus' *On the Names of the Parts of the Body*

[1] Τί πρῶτον ἔμαθες ἐν κιθαριστικῇ; Κρούειν ἑκάστην τῶν χορδῶν καὶ ὀνομάζειν. [2] Τί δὲ πρῶτον ἔμαθες ἐν γραμματικῇ; Γνωρίζειν ἕκαστον τῶν γραμμάτων καὶ ὀνομάζειν. [3] Οὐκοῦν καὶ τὰς ἄλλας τέχνας ὡσαύτως ἀπὸ τῶν ὀνομάτων ἄρχονται διδάσκειν, καὶ ὁ χαλκεὺς, καὶ ὁ σκυτοτόμος, καὶ ὁ τέκτων, πρῶτον καὶ σιδήρου ὄνομα, καὶ σκεύους, καὶ οὐτινοσοῦν ἄλλου τῶν πρὸς τὴν τέχνην. [4] Καὶ ὅσαι σεμνότεραι, οὐχὶ καὶ ταύτας ἀπὸ τῶν ὀνομάτων ὡσαύτως ἄρχονται διδάσκειν; [5] Τί γὰρ πρῶτον ἔμαθες ἐν γεωμετρίᾳ; Στιγμὴν, καὶ γραμμὴν, καὶ ἐπίπεδον, καὶ ἐπιφάνειαν, καὶ σχῆμα τρίγωνον, καὶ κύκλον, καὶ τὰ ὅμοια, εἰδέναι τε ὅ τι ἕκαστον αὐτῶν, καὶ ὀνομάζειν ὀρθῶς.

[6] Βούλει οὖν καὶ τὰ ἰατρικὰ ἀπὸ τῶν ὀνομάτων ἀρξάμενος μανθάνειν, καὶ πρῶτον μὲν ὅ τι χρὴ καλεῖν ἕκαστον τοῦ σώματος μόριον, ἔπειτα τὰ ἄλλα ὅσα ἂν ἕπηται τῷ λόγῳ, ἢ δοκεῖ σοι ἱκανὸν εἶναι δεικνύντα δηλοῦν ὥσπερ κωφὸν ὅ τι χρῄζεις διδάξαι; [7.] Ἐμοὶ μὲν οὐ δοκεῖ ἐκεῖνο ἄμεινον· οὐκ εὐμαθὲς δὲ καὶ ῥᾷστον οὕτω καὶ μανθάνειν αὐτὸν, καὶ ἕτερον διδάσκειν. [8] Καὶ τοῦτό μοι δοκεῖ οὕτως. [9] Ἀκούων δὴ καὶ ἀποβλέπων εἰς τὸν παῖδα τοῦτον διαμνημονεύσεις τὰ ἐπιφανῆ πρῶτον· εἶτα ὡς χρὴ καλεῖν τὰ ἔνδον, ζῶόν τι, ὃ μάλιστα ἀνθρώπῳ ἔοικε, διελόντες, διδάσκειν σε πειρασόμεθα·οὐδὲν γὰρ ἐμποδὼν, εἰ

μὴ καὶ παντάπασιν ἐοίκασιν, τὸ γοῦν κεφάλαιον ἑκάστου διδάξαι. [10.] Πάλαι δὲ γενναιότερον ἐπὶ ἀνθρώπων ἐδίδασκον τὰ τοιαῦτα. [11] Ἔστι δὲ τὰ μέγιστα μέρη τοῦ σώματος, κεφαλὴ, καὶ αὐχὴν, καὶ θώραξ, καὶ χεῖρες, καὶ σκέλη· θώρακα γὰρ οὐ μόνον τὰ ἀπὸ τῶν κλειδῶν μέχρι τῶν ὑποχονδρίων καλοῦμεν, ἀλλὰ καὶ τὸ σύμπαν ἀπὸ κλειδῶν μέχρι τῶν αἰδοίων. [12] Κεφαλὴ δὲ καὶ τὸ τετριχωμένον καλεῖται κατὰ ἑαυτὸ, καὶ σὺν τῷ προσώπῳ. [13] Τοῦ δὲ τετριχωμένου τὸ μὲν ἔμπροσθεν, βρέγμα· τὸ δὲ ὄπισθεν, ἰνίον· τὰ δὲ ἑκατέρωθεν τὸ μὲν ἔμπροσθεν, βρέγμα· τὸ δὲ ὄπισθεν, ἰνίον· τὰ δὲ ἑκατέρωθεν τοῦ βρέγματος, κόρσαι καὶ κρόταφοι· τὸ δὲ ἐν μέσῳ κατὰ ὃ δὴ μάλιστα εἰλοῦνται αἱ τρίχες, κορυφή· τὸ δὲ ὑπὸ τῷ βρέγματι, μέτωπον. [14] Αἱ δὲ παρὰ τοὺς κροτάφους τῶν τριχῶν ἐκφύσεις, ἴουλοι· χαῖται δὲ, αἱ ὄπισθεν κατὰ τὸ ἰνίον ἀφειμέναι τρίχες. [15] Αἱ δὲ ἔσχαται τοῦ μετώπου ῥυτίδες, ἐπισκύνιον, ὅπερ ἐπάγομεν τοῖς ὀφθαλμοῖς ἢν πρὸς ἑαυτούς τι φροντίζωμεν ἢ αἰδώμεθα. [16] Ἄλλοι δὲ τὸ ὑπὸ τὰς ὀφρύας σαρκῶδες, ἐπισκύνιον ὀνομάζουσιν. [18] Ὀφρύες δὲ τὰ τετρι χωμένα τοῦ μετώπου πέρατα, ᾧν τὸ μεταξὺ μεσόφρυον.

[19] Ὑπὸ δὲ ταῖς ὀφρύσι, βλέφαρα, τὸ μὲν ἄνωθεν, τὸ δὲ κάτωθεν. Τούτων δὲ αἱ μὲν ἐκπεφυκυῖαι τρίχες, ταρσοὶ, καὶ βλεφαρίδες. [20] Τὰ δὲ ψαύοντα ἀλλήλων πέρατα ἐν τῷ καθεύδειν ἡμᾶς, στεφάναι, καὶ χη λαί. Τοῦ δὲ ἄνω βλεφάρου τὸ ἐπιπολῆς, κύλον. [21] Τὰ δὲ κοῖλα πέρατα τοῦ τε ἄνω καὶ τοῦ κάτω βλεφάρου, κανθοί· [22] ὁ μὲν μείζων, ὁ πρὸς τὴν ῥῖνα, ὁ δὲ ἐλάσσων, ὁ πρὸς τῷ κροτάφῳ. [23] Ὀφθαλμοῦ δὲ, τὸ μὲν ἐν μέσῳ βλεπόμενον, ὄψις καὶ κόρη. [24] Καὶ γλήνην τὸ εἴδωλον τὸ ἐν τῇ ὄψει φαινόμενον καλοῦσιν·

[25] τὸ δὲ συνεχὲς τῇ ὄψει μέχρι τοῦ λευκοῦ, ἶριν. Τοῦτο δὲ ὡς ἔχει χρώματος, μέλαν, ἢ πυῤῥὸν, ἢ γλαυκὸν, ἢ χαροπὸν ὀνομάζουσιν. Περιθεῖ δὲ στεφάνη τὸ μέλαν, καὶ ἀποκρίνει τοῦ λευκοῦ. Κύκλος δὲ ἡ στεφάνη καὶ σύνδεσμος τῶν χιτώνων τοῦ ὀφθαλμοῦ, ὧν δὴ ὁ πρῶτος δύο ἔχων φύσεις, δύο ὀνόματα ἔχει· κερατοειδὴς μὲν κατὰ τὸ μέσον καὶ μέχρι τῆς ἴριδος· τοῦτο γὰρ καὶ ἔοικεν αὐτοῦ τοῖς ξυομένοις κέρασιν· λευκὸς δὲ τὸ ἄλλο μέρος πᾶν, οἰόσπερ καὶ βλέπεται, οὐδὲν ἐοικὼς τῷ μέσῳ, οὔτε τὴν φύσιν, οὔτε τὴν χροιάν. [28] Ἐπίκειται δὲ αὐτῷ ἄνωθεν ἡ καλουμένη ἐπιδερμὶς, ἥτις καὶ ἐν νέοις, καὶ ἐν πρεσβύταις, καὶ ἐν τῷ παθήματι τῇ χημώσει ἀφεσταμένη τε καὶ ἐπαίρουσα τὸ πυῤῥὸν ὁρᾶται. [29] Τοὺς δὲ ἄλλους χιτῶνας ὅπως χρὴ ὀνομάζειν, εἰρήσεται ὀλίγον ὕστερον ἐν τῇ διαιρέσει τοῦ ζῴου. [30] Τὰ δὲ ὑπὸ τοῖς ὀφθαλμοῖς ἐπανεστηκότα ὀστᾶ, ὑποφθάλμια, οἱ δὲ ὑπώπια καλοῦσιν.

[31] Ἀπὸ δὲ τοῦ μεσοφρύου τέταται ἡ ῥίς. [32] Ταύτης δὲ τὰ μὲν τρήματα, μυκτῆρες καὶ ῥώθωνες· [33] Ἀθηναῖοι δὲ καὶ μύξας ὀνομάζουσιν. Ἱπποκράτης δὲ τὸ διὰ αὐτῶν φλεγματῶδες περίσσωμα ἰὸν μύξαν καλεῖ· Ἀθηναῖοι δὲ τὸ περίσσωμα τοῦτο κόρυζαν καλοῦσιν. [34] Τὸ δὲ μεταξὺ τῶν τρημάτων χονδρῶδες, ῥινὸς διάφραγμα. [35] Τὰ δὲ ἑκατέρωθεν ἐπὶ τὰ μῆλα νεύοντα ὀστώδη, ῥινὸς ῥάχις· [36] τὸ δὲ πέρας τοῦ ὀστώδους ὑψώματος τὸ ἔνθεν καὶ ἔνθεν, πτερύγια. Ταῦτα δὲ καὶ κινεῖται ἐν ταῖς σφοδραῖς δυσπνοίαις, καὶ ἄλλως βουληθέντων. [37] Τὸ δὲ πρὸ τοῦ διαφράγματος τῆς ῥινὸς σαρκῶδες ἐπὶ τὸ χεῖλος καθῆκον, κίων. [38] Τὸ δὲ ἄκρον τῆς ῥινὸς, σφαιρίον. [39] Τὸ δὲ ὑπὸ τῷ κίονι ἐν τῷ ἄνω χείλει κοῖλον, φίλτρον. [40] Τὸ δὲ ὅλον μετὰ τὸν ῥῖνα τοῦ ἄνω χείλους, ὑποῤῥίνιον. [41] Εἶτα χείλη δύο, ὧν τὰ μὲν ἄκρα, πρόχειλα· τὸ δὲ σύμβλητον τῶν χειλῶν, προστόμιον. [42] Τὸ δὲ ἐπὶ τῷ κάτω χείλει κοῖλον, νύμφη.

[43] Τῶν δὲ ὤτων, ἀκοὴ μὲν, ὁ πόρος διὰ οὗ ἀκούομεν· λοβὸς δὲ, τὸ ἐκκρεμὲς, ὅπερ καὶ μόνον Ἀριστοτέλης φησὶ τοῦ ὠτὸς ὀνομάζεσθαι, τὰ δὲ ἄλλα ἀνώνυμα εἶναι. [44] Οἱ δὲ ἰατροὶ καὶ ταῦτα ὠνόμασαν, πτερύγιον μὲν τὸ ἀνωτάτω πλατὺ ἐπικλινές· ἕλικα δὲ, τὸ ἐντεῦθεν συμπληροῦν τὴν περιφέρειαν τῶν ὤτων· ἀνθέλικα δὲ τὸ ἐν μέσῳ ὑπεραῖρον τὴν κοιλότητα· κόγχην δὲ τὸ ἀπὸ τῆς ἀνθέλικος κοῖλον· τὸ δὲ ἀπεναντίον τῆς κόγχης ἔξαρμα παρὰ τὸ πέρας τοῦ κροτάφου, τράγον· τὸ δὲ τῆς ἕλικος τέλος τὸ ὑπότραχυ, ἀντιλοβίδα.

[45] Πρόσωπον δὲ ὠνόμασται πᾶν τὸ ἔμπροσθεν τῆς κεφαλῆς. [46] Μῆλα δὲ τὰ ὑπὸ τοῖς ὀφθαλμοῖς ἐξάρματα τοῦ προσώπου, ἃ δὴ καὶ αἰδουμένων ἡμῶν ἐρυθραίνεται. [47] Ἀπὸ δὲ τῶν μήλων αἱ παρειαί· καλοῦνται καὶ σιαγόνες, καὶ γνάθοι· καὶ προσέτι γένυς ἡ μὲν κάτω, ἡ δὲ ἄνω· καὶ τὸ ἄποξυ τῆς κάτω γνάθου, γένειον καὶ ἀνθερεών. [48] Τὸ δὲ ὑπὸ τὴν κάτω γνάθον σαρκῶδες, λευκανίαν· οἱ δὲ ἀνθερεῶνα μὲν τοῦτο, λευκανίαν δὲ τὸ πρὸς τῇ κλειδὶ κοῖλον ὀνομάζουσιν. [49] Τοῦ δὲ πώγωνος, ἡ μὲν ὑπὸ τοῖς κροτάφοις πρώτη βλάστησις, ἴουλος· ἡ δὲ ἐπὶ τῷ ἄνω χείλει, προπωγώνιον· αὐξηθεῖσαι δὲ αὗται αἱ τρίχες, μύστακες· αἱ δὲ ἐπὶ ἄκρου γώνιον· αὐξηθεῖσαι δὲ αὗται αἱ τρίχες, μύστακες· αἱ δὲ ἐπὶ ἄκρου τοῦ γενείου, πάππος· αἱ δὲ κάτω τῆς γένυος, ὑπήνη.

[50] Στόμα δὲ καὶ ἡ πρώτη τομὴ τῶν χειλῶν, καὶ ἡ ἐφεξῆς εὐρυχωρία μέχρι τῆς φάρυγγος. [51] Ἐν δὲ τῷ στόματι ἄλλα τέ ἐστι, καὶ οἱ ὀδόντες· ἔνιοι δὲ κραντῆρας ὀνομάζουσιν· τούτων δὲ τομεῖς μὲν τοὺς ἔμπροσθεν τέσσαρας, κυνόδοντας δὲ τοὺς ἐφεξῆς, ἕνα ἑκατέρωθεν· μύλους δὲ καὶ γομφίους τοὺς μετὰ τοὺς κυνόδοντας, πέντε

ἑκατέρωθεν· σωφρονιστῆρας δὲ, τοὺς ἐσωτάτω καὶ ἐσχάτους, ἡνίκα ἂν δὴ σωφρονεῖν ἄρχωνται, φυομένους ἕνα ἑκατέρωθεν. [52] Τοσοῦτοι μὲν οἱ τῆς ἄνω γνάθου· τοσοῦτοι δὲ καὶ οἱ τῆς κάτω καὶ ὡσαύτως ὠνομασμένοι. [53] Ἡ δὲ σύνδεσις τῶν γνάθων, χαλινός. [54] Τράπεζαι δὲ τὰ πλατέα τῶν γομφίων. [55] Ὀλμίσκοι δὲ καὶ φάτναι, αἱ τῶν γνάθων κοιλότητες, εἰς ἃς ἐμπεπήγασιν οἱ ὀδόντες. [56] Οὖλα δὲ αἱ περὶ τὰς ῥίζας σάρκες. [57] Τῆς δὲ γλώσσης, ῥίζα μὲν, ὅθεν ἐκπέφυκεν· τὸ δὲ ἐν τῷ στόματι μυῶδες γλῶσσα καλεῖται· αὐχὴν δὲ τὸ ἐφεξῆς· παράσειρα δὲ τὰ ἔνθεν καὶ ἔνθεν τῆς γλώσσης.

[58] Ὑπογλωσσὶς δὲ, τὸ κάτωθεν· ἐπιγλωσσὶς δὲ τὸ ἔνδον ἐπὶ τοῦ βρόγχου πῶμά τι γινόμενον, ὅταν καταπίνωμεν, ὑπὲρ τοῦ μηδὲν εἰς τὸν πλεύμονα ἐμπίπτειν· ἀναπνεόντων δὲ μετέωρόν ἐστιν, ὡς μὴ κωλύῃ τὸ ἀναπνεῖν. [59] Οὐρανὸς δὲ καὶ ὑπερῴα τὸ περιφερὲς τῆς ἄνω γνάθου. [60] Κίων δὲ καὶ γαργαρεὼν ἡ ἐκ τῆς ὑπερῴας πρόσφυσις.
[61] Ἀριστοτέλης δὲ σταφυλοφόρον αὐτὸ καλεῖ, ὅτι φλεγμήναντος σταφυλῇ τι ὅμοιον ἐξ αὐτοῦ κρεμάννυται· σταφυλὴν γὰρ, οὐ τὸ μόριον, ἀλλὰ τὸ πάθημα χρὴ ὀνομάζειν. [62] Φάρυγξ δὲ ἢ φαρύγεθρον, ἡ πρὸς τῇ καταπόσει πᾶσα εὐρυχωρία. [63] Ταῦτα ἄρα καὶ Ὅμηρος ἐποίησεν·

…φάρυγος δ’ ἐξέσσυτο οἶνος
ψωμοί τ’ ἀνδρόμεοι…

οὐ γὰρ δὴ ἐκ τοῦ βρόγχου καὶ τοῦ πλεύμονος ἐπανήμει ὁ Κύκλωψ τὸ σιτίον καὶ πόμα· τοῦτο γὰρ δεινῶς ἀμαθὲς καὶ ἀνόητον.

[64] Παρίσθμια δὲ καὶ ἀντιάδες καὶ μῆλα, τὰ ἑκατέρωθεν τοῦ φαρυγέθρου σαρκώδη καὶ ἀδενοειδῆ. [65] Τέσσαρες δέ εἰσιν αἱ ἀντιάδες, αἱ μὲν ἔνθεν καὶ ἔνθεν ἄκρου τοῦ βρόγχου· αἱ δὲ ἐφεξῆς καὶ κατωτέρω.

[66] Μετὰ δὲ τὴν κεφαλὴν, τράχηλος· τὸ δὲ αὐτὸ καὶ δειρὴ καὶ αὐχήν·ὑποδειρὶς δὲ τὸ ἐκ τῶν πρόσθεν τελευταῖον τῆς δειρῆς. [67] Τραχήλου δὲ τὸ μὲν ἔμπροσθεν, βρόγχος καὶ τραχεῖα ἀρτηρία, διὰ οὗ ἀναπνέομεν· καὶ ἡ ὑπεροχὴ τοῦ βρόγχου, λάρυγξ· τὸ δὲ ὄπισθεν αὐτοῦ, τένοντες. Τὸ δὲ πρὸς ταῖς κλεισὶ κοῖλον [68] Ὅμηρος μὲν καλεῖ λευκανίην, οἱ δὲ ἰατροὶ ἀντικάρδιον καὶ σφαγήν. [69]Τὰ δὲ ἀπὸ τῶν τενόντων ἐπὶ τοὺς ὤμους καθήκοντα, ἐπωμίδες.

[70] Ὦμος δὲ, ἡ κεφαλὴ τοῦ βραχίονος, ἡ πρὸς τὴν ὠμοπλάτην, καὶ τὸ σύμπαν ἄρθρον· κοτύλη δὲ ὤμου τὸ κοῖλον τῆς ὠμοπλάτης. [71] Ὠμοπλάται δὲ τὰ ἐγκείμενα τῷ νώτῳ πλατέα ὀστᾶ, ὧν αἱ διὰ μέσου ὑπεροχαὶ, ῥάχεις ὠμοπλατῶν. [72] Ἀκρώμιον δὲ ὁ σύνδεσμος τῆς κλειδὸς καὶ τῆς ὠμοπλάτης. [73] Εὔδημος δὲ ὀστάριον εἶναί φησι μικρὸν τὸ ἀκρώμιον. [74] Κλεῖδες δὲ τὰ ὑπὸ τῷ τραχήλῳ ὀστᾶ· αὗται πρὸς τὸ στῆθος ἠρθρωμέναι εἴργουσι τοὺς ὤμους καὶ τὰς ὠμοπλάτας μὴ συμπίπτειν, ὥσπερ τοῖς ἄλλοις ζῴοις· ἐκεῖνα γὰρ κλεῖδας οὐκ ἔχει· διὰ τοῦτο καὶ ἄνθρωπος πλατυστερνότατος.

[75] Μασχάλη δέ ἐστι τὸ ὑπὸ τῷ ὤμῳ κοῖλον, εἰς ἣν τὰ πολλὰ ὀλισθαίνει ὁ ὦμος. [76] Μάλην δὲ οὐχ ἑλληνικὸν ὀνομάζειν· τὸ δὲ φέρειν τι κρύπτοντα ἐν τῇ μασχάλῃ, ὑπὸ μάλης ἔχειν λέγεται.

[77] Βραχίων δὲ τὸ ἐφεξῆς τοῦ ὤμου· τούτου δὲ ἡ μὲν πρὸς τῷ ὤμῳ περιφέρεια, κεφαλὴ βραχίονος, καὶ ἡ ἔσω ὑπεροχὴ παρὰ τὸν ἀγκῶνα, ἣν δή φησιν Ἱπποκράτης ἐνίους ἀμαθῶς νομίζειν ἀπόφυσιν εἶναι τοῦ πήχεος, καὶ αὐτὴ κεφαλὴ βραχίονος. [78] Μετὰ δὲ τὸν βραχίονα, ἀγκὼν τὸ σύμπαν ἄρθρον, καὶ τὸ ὀξὺ ἐπὶ οὗ κλινόμενοι στηριζόμεθα. [79] Οἱ δὲ ὀλέκρανον καλοῦσιν· Δωριεῖς δὲ οἱ ἐν Σικελίᾳ κύβιτον· Ἐπίχαρμος δὲ καὶ τὸ παίειν τῷ ἀγκῶνι κυβιτίζειν ἔλεγεν. [80] Τῶν δὲ ὀστῶν τοῦ ἀγκῶνος, τὸ μὲν ὑποτεταγμένον, πῆχυς, τὸ δὲ ἐπικείμενον, κερκίς· περαίνει δὲ ταῦτα πρὸς τὸν καρπόν. [81] Τὸ δὲ ἐφεξῆς τοῦ καρποῦ πλατὺ καὶ συμφυὲς, μετακάρπιον, καὶ ταρσός· εἶτα δάκτυλοι.

[82] Χεὶρ δὲ τὸ ὅλον ἀπὸ τοῦ ὤμου καὶ ᾧ κρατοῦμεν. [83] Δακτύλων δὲ ὁ μέν τις μέγας, ἀφεστηκὼς τῶν ἄλλων·ὁ δὲ λιχανὸς, ὁ πρῶτος τῶν τεσσάρων· ὁ δὲ μέσος, ὁ δὲ παρά μεσος, ὁ δὲ μικρός. [84] Τὰ δὲ ὀστᾶ αὐτῶν, σκυταλίδες καὶ φάλαγγες·τὰ δὲ πρῶτα ἄρθρα προκόνδυλοι, τὰ δὲ ἐφεξῆς κόνδυλοι, τὰ δὲ τελευταῖα μετακόνδυλοι. [85] Αἱ δὲ τῶν ὀνύχων ἀρχαὶ, ῥιζωνύχια· τὰ δὲ ἔσωθεν πέρατα τῶν δακτύλων, ῥᾶγες, καὶ κορυφαί. [86] Στῆθος δὲ τὸ ὑπερέχον ἀπὸ τοῦ μεγάλου δακτύλου σαρκῶδες ὑπὸ τὸ κοῖλον τῆς χειρός. [87] Θέναρ δὲ τὸ μεταξὺ διάστημα τοῦ λιχανοῦ καὶ τοῦ μεγάλου δακτύλου σαρκῶδες, ὑπὸ ᾧ τὸ κοῖλον τῆς χειρός· ὑπόθεναρ δὲ τὸ ὑπὸ τοῖς τέσσαρσι δακτύλοις. [88] Δοκεῖ δέ μοι Ἱπποκράτης πᾶν τὸ πλατὺ τῆς χειρὸς θέναρ ὀνομάζειν.

[89] Ἀπὸ δὲ τῶν κλειδῶν στῆθος μὲν τὸ ἔμπροσθεν τὸ μέσον· εἰς ὃ [90.] δὲ ἐμβάλλουσιν αἱ πλευραὶ, στέρνον. Νῶτον δὲ τὸ ἐξόπισθεν ἀπὸ τοῦ αὐχένος μέχρι τοῦ μεταφρένου· μετάφρενον δὲ τὸ μεταξὺ τοῦ νώτου καὶ ὀσφύος κατὰ τὴν τῶν φρενῶν πρόσφυσιν· ὀσφὺς δὲ τὸ τελευταῖον τῆς ῥάχεως. [91] Αἱ δὲ ὑπὸ τῷ στήθει σαρκώδεις

ὑπεροχαὶ, μαστοὶ, καὶ τιτθοί· μαστοῦ δὲ τὸ μὲν ἄκρον, θηλή. [92] Ἡ δὲ πρώτη ἐν τῷ ἡβάσκειν αὔξησις, κύαμος· ὁ δὲ ὅλος ὄγκος, ἄσκωμα· [93] κυριώτερον δὲ ἐν γυναικί.

[94] Πλευρὸν δὲ καλεῖται πᾶν τὸ ὑπὸ τῇ μασχάλῃ· τὰ δὲ ὀστᾶ, πλευραί· τὰ δὲ μεταξὺ αὐτῶν, μεσοπλεύρια. Νόθαι δὲ πλευραὶ, αἱ μὴ περαίνουσαι πρὸς τὸ στέρνον. [95] Τὸ δὲ ὑπὸ τῷ στήθει κοῖλον, στόμα κοιλίας· οἱ δὲ προκάρδιον, οἱ δὲ καρδίαν ὀνομάζουσι, καὶ τοὺς πόνους τοὺς ἐνταῦθα, καρδιωγμοὺς καὶ καρδιαλγίας. [96] Χόνδροι δὲ τὰ πέρατα τῶν πλευρῶν τῶν νόθων· ὑποχόνδρια δὲ τὰ ὑπὸ τοῖς χόνδροις μυώδη.

[97] Κοιλία δὲ καὶ γαστὴρ, τὸ ἐφεξῆς· ἐπιγάστριον δὲ τὸ ἐπὶ τῆς γαστρὸς δέρμα. [98] Ὀμφαλὸς δὲ τὸ ἐν μέσῳ κοῖλον, ἡ ἀποτομὴ τῶν φλεβῶν, διὰ ὧν τὸ ἔμβρυον τρέφεται· τούτου δὲ τὸ ἐν μέσῳ, ἀκρόμφαλον. [99] Τὸ δὲ ὑποκείμενον τῷ ὀμφαλῷ δέρμα, γραῖα, ὅτι ῥυτιδούμενον γῆρας σημαίνει. [100] Τὸ δὲ ὑποκάτω τοῦ ὀμφαλοῦ, ὑπογάστριον καὶ ἦτρον· τὸ δὲ συνεχὲς τούτῳ μέχρι τῶν αἰδοίων ἐπίσειον, καὶ ἤβην, ἄλλοι δὲ ἐφήβαιον καλοῦσιν.

[101] Τῶν δὲ αἰδοίων, τοῦ μὲν τοῦ ἄῤῥενος ἡ μὲν ἀποκρεμὴς φύσις, καυλὸς, καὶ στῆμα· τὸ δὲ μὴ ἐκκρεμὲς, ὑπόστημα, καὶ κύστεως τράχηλος· καὶ ἡ διὰ μέσου γραμμὴ, τραμίς· οἱ δὲ ὄῤῥον ὀνομάζουσιν. [102] Τὸ δὲ πέρας τοῦ καυλοῦ, βάλανος, καὶ τὸ δέρμα τὸ περὶ αὐτῇ, πόσθη, καὶ τὸ ἔσχατον τῆς ποσθῆς, ἀκροπόσθιον. [103] Καὶ τὸ κοίλωμα διὰ οὗ τὸ σπέρμα καὶ τὸ οὖρον ἀποκρίνεται, οὐρήθρα, καὶ πόρος οὐρητικός· οὐρητῆρα δὲ οὐ χρὴ καλεῖν· εἰσὶ γὰρ οὐρητῆρες ἄλλοι, διὰ ὧν τὸ οὖρον ἀπὸ νεφρῶν εἰς κύστιν ῥεῖ.

[104] Ὄσχεος δέ ἐστιν ἐν ᾧ οἱ δίδυμοι· διδύμους δὲ ἢ ὄρχεις καλεῖν οὐδὲν διαφέρει. [105] Τῶν δὲ διδύμων τὸ μὲν ἐπάνω, κεφαλὴ, τὸ δὲ κάτω, πυθμήν. [107] Καὶ τὸ χαλώμενον τοῦ ὀσχέου λακκόπεδον. [108] Ὃ δὲ ἀεὶ χαλαρὸν, λακκοσχέαν τοῦτον Ἀθηναῖοι καλοῦσιν. Τὰ δὲ μεταξὺ ὀσχέου καὶ ὑποστήματος καὶ μηροῦ, πλιχάδες.

[109] Τῆς δὲ γυναικὸς τὸ αἰδοῖον, κτεὶς μὲν τὸ τρίγωνον πέρας τοῦ ὑπογαστρίου· [110] ἄλλοι δὲ ἐπίσειον καλοῦσιν. Σχίσμα δὲ, ἡ τομὴ τοῦ αἰδοίου. [111] Τὸ δὲ μυῶδες ἐν μέσῳ σαρκίον, νύμφη, καὶ μύρτον· οἱ δὲ ὑποδερμίδα, οἱ δὲ κλειτορίδα ὀνομάζουσι, καὶ τὸ ἀκολάστως τούτου ἅπτεσθαι κλειτοριάζειν λέγουσιν. [112] Μυρτόχειλα δὲ τὰ ἑκατέρωθεν σαρκώδη· ταῦτα δὲ Εὐρυφῶν καὶ κρημνοὺς καλεῖ· οἱ δὲ νῦν τὰ μὲν μυρτόχειλα, πτερυγώματα, τὸ δὲ μύρτον, νύμφην.

[113] Τῆς δὲ ῥάχεως τὰ ὀστᾶ σφόνδυλοι· Ὅμηρος δὲ καὶ ἀστραγάλους αὐτὰ καλεῖ· καὶ ἡ ἀπόφυσις τῶν σφονδύλων, ἄκανθα. [114] Τὸ δὲ τελευταῖον ὀστοῦν τῆς ὀσφύος, ἱερὸν ὀστοῦν· οἱ δὲ ὑποσφόνδυλον καλοῦσιν· τὸ δὲ ἄκρον αὐτοῦ, κόκκυγα. [115]Τὰ δὲ ὑπὸ ταῖς πλευραῖς, λαπάραι καὶ κενεῶνες· εἶτα λαγόνων ὀστᾶ, καὶ τούτων αἱ κοιλότητες, κοτύλαι.

[116] Πυγαὶ δὲ τὰ μετὰ τὴν ὀσφὺν σαρκώδη, καὶ ἐφέδρανα, ἐπὶ ὧν καθίζομεν· ἄλλοι δὲ γλουτοὺς καλοῦσιν· τὰ δὲ ὑπὸ τοὺς γλουτοὺς, ὑπογλουτίδες. [117] Βουβῶνες δὲ τὰ ἔμπροσθεν τῶν μηρῶν τὰ παρὰ τὴν ἥβην. [118] Ἰσχίον δὲ καὶ τὸ νεῦρον τὸ πρὸς τὴν κοτύλην, καὶ ὅλον τὸ ἄρθρον. [119] Τῶν δὲ μηρῶν τὰ ἔσω, παραμήρια· τὰ δὲ μεταξὺ τῶν μηρῶν, μεσομήρια. [120] Οἱ δὲ πρὸς τοῖς γόνασι μύες, ἐπιγουνίδες, καὶ τὸ ὀστοῦν τὸ ἐπὶ

τῷ γόνατι, ἐπιγονατίς· Ἱπποκράτης δὲ ἐπιμυλίδα ὀνομάζει. Γόνυ δέ ἐστι τὸ ἄρθρον τοῦ μηροῦ τὸ πρὸς τὴν κνήμην, [121] καὶ ἰγνύα τὸ ὄπισθεν, ἐν ᾧ κάμπτομεν τὸ γόνυ. [122] Γαστροκνημία δὲ, ὁ μέγας μῦς ὁ ὄπισθεν τῆς κνήμης, ἀπὸ οὗ τὸ πλατὺ νεῦρον τὸ πρὸς τῇ πτέρνῃ πέφυκεν.

[123] Τῶν δὲ ὀστῶν τὸ μὲν ἔσω, κνήμη, καὶ τούτου τὸ ἔμπροσθεν, ἀντικνήμιον· [τὸ δὲ ἔξω, κερκίς·] Ἡρόφιλος δὲ καὶ τὴν κνήμην κερκίδα ὀνομάζει. [124] Τὰ δὲ ἄκρα ἀμφοῖν τοῖν ὀστοῖν τὰ πρὸς τῷ ποδὶ, σφυρὰ καλεῖται, ἀστράγαλοι δὲ οὐκ ὀρθῶς· ἔχει μὲν γὰρ καὶ ἀστράγαλον ὁ ποὺς τοῦ ἀνθρώπου ὑπὸ τῷ σφυρῷ, κἂν οὐκ ἐμφανῆ. [125] Πτέρνα δὲ τὸ ὄπισθεν περιφερὲς τοῦ ποδός· πεδίον δὲ καὶ ταρσὸς τὸ ἔμπροσθεν πλατύ· στῆθος δὲ τὸ κάτωθεν μετὰ τὸ κοῖλον, ἀπὸ οὗ οἱ δάκτυλοι. [126] Καλεῖν δὲ τούτους ἀνάλογον τοῖς τῆς χειρὸς δακτύλοις, καὶ τὰ ἄλλα κοινὰ πρὸς τοὺς τῶν χειρῶν δακτύ λους οὐδὲν κωλύει.

[127] Τὰ μὲν οὖν ἐπιφανῆ, ὦ παῖ, σὺν τοῖς ὑποκειμένοις ὀστοῖς οὕτω χρὴ καλεῖν τὰ δὲ ἔνδον τουτονὶ τὸν πίθηκον ἀνατέμνοντες, ὀνομάζειν πειρασόμεθα· ἐγγυτάτω γὰρ τὴν φύσιν ἀνθρώπου καὶ τοῖς ὀστοῖς, καὶ τοῖς μυσὶ, καὶ τοῖς σπλάγχνοις, καὶ ταῖς ἀρτηρίαις, καὶ ταῖς φλεψὶ, καὶ τοῖς νεύροις· δεύτερα δὲ τὰ ἄλλα τὰ πολυσχιδῆ· τρίτα τὰ ἀμφώδοντα τῶν διχήλων· τὰ δὲ μὴ ἀμφώδοντα καὶ μώνυχα, προσωτάτω. [128] Εἰ δέ τι ἤδη εἴρηται μετὰ τῶν ἐπιφανῶν, οὐδὲν δεῖ ὑπὲρ τούτου δὶς λέγειν.

[129] Ὅρα δὴ τοίνυν τὸν ὑπὸ τῷ δέρματι τοῦ κρανίου χιτῶνα· οὗτος περικράνιος καλεῖται· ὃν δὲ ἂν ἴδοις περὶ τοῖς ἄλλοις ὀστέοις, περιόστεος καλεῖται. [130]Τὰς δὲ συμβολὰς τῶν ὀστῶν τοῦ κρανίου, ῥαφὰς καλοῦσιν· ἐοίκασι δὲ δυοῖν πριόνων συνθέσει·

ὧν μία μὲν περιφερὴς ῥαφὴ τὸ βρέγμα περιτέμνεται· ἄλλη δὲ τὸ ἰνίον, ἄλλη δὲ μέσην τὴν κορυφήν. [131] Ἔστι δὲ οἷς αὕτη ὑπερβᾶσα τὴν διὰ τοῦ βρέγματος, τελευτᾷ εἰς τὸ μεσόφρυον. [132] Δύο δὲ ἄλλαι τοῖς ὀστοῖς τῶν κροτάφων, ὥσπερ λεπίδες ἐπιπεφύκασιν. [133] Ὀνόματα δὲ αὐτῶν παλαιὰ οὐκ ἔστιν, ἀλλὰ νῦν ἐτέθη ὑπό τινων Αἰγυπτίων ἰατρῶν φαύλως ἑλληνιζόντων· στεφανιαία μὲν τῇ πρὸς τὸ βρέγμα, λαμβδοειδὴς δὲ, τῇ περὶ τὸ ἰνίον, ἐπιζευγνύουσα δὲ, τῇ μέσῃ· λεπιδοειδεῖς δὲ, ταῖς τῶν κροτάφων. [134] Οὗτοι δὲ καὶ τῶν ἄλλων ὀστῶν μόρια ὀνομάζουσιν ἀνώνυμα τοῖς πάλαι, ἃ ἐγὼ οὐ παραλείψω διὰ τὴν εἰς τὰ νῦν τῶν ἰατρῶν δήλωσιν. [135] Διπλόη δὲ τὸ μεταξὺ τῶν ὀστῶν [136.] τοῦ κρανίου, ὅθεν δὴ ἡ ῥὶς ἄρχεται. Τὰ πυκνὰ ταύτῃ τρήματα ἠθμοειδῆ καλεῖται, διὰ ὧν τὸ μὲν ἀληθὲς πταρμὸς καὶ μύξα ἀποκρίνεται· οἱ δὲ καὶ ἀναπνεῖν ἡμᾶς εἰς ἐγκέφαλον ταύτῃ λέγουσιν.

[137] Τὰ δὲ πλησίον τῶν ὤτων ὀστᾶ, διὰ στερεότητα λιθοειδῆ ὠνόμασται. [138] Ἔστι δὲ ἑκατέρωθεν ἓν σκληρὸν καὶ ὑπόλευκον, ὅσον κεφαλὴ τοῦ μεγάλου τῆς χειρὸς δακτύλου, διὰ ὧν αἱ ἀκοαὶ τέτρηνται. [139] Ἄλλοι δὲ τὰς πρὸς τῷ ἰνίῳ καταφερεῖς ὑπεροχὰς λιθοειδεῖς καλοῦσιν· ἀλλὰ οὐκ ὀρθῶς· ὑπόκενοι γὰρ καὶ σηραγγώδεις, καὶ οὐ στερεαὶ κατὰ τοὔνομα. [140] Αἱ δὲ ἀπὸ τῶν ἀκοῶν τείνουσαι πρὸς τὰ μῆλα ἀποφύσεις, ζυγώματα.

[141] Καὶ οἱ μύες, οἱ μὲν ἐν ταῖς κοιλότησι τῶν κροτάφων, κροταφῖται· [142] οἱ δὲ περὶ τὴν κάτω γνάθον, μασητῆρες. Αὐταὶ δὲ αἱ λεπταὶ καὶ ὑπομήκεις καὶ κάτω πρὸς τὸ φαρύγεθρον νεύου σαι ἀποφύσεις, στιλοειδεῖς καλοῦνται. [143] Εὔδημος δὲ εἰκάζει μὲν αὐτὰς ἀλεκτρυόνων πλήκτροις, ἀνωνύμους δὲ ἐᾷ.

[144] Τρήματα δὲ πολλὰ μὲν διατέτρηται διὰ τοῦ κρανίου· πάντα δὲ οὐκ ὠνόμασται χωρὶς δυοῖν τυφλὰ δὲ ταῦτα καλοῦσιν· καὶ οἱ ἰατροὶ διαφέρονται πρὸς ἀλλήλους, ὁπότερα χρὴ καλεῖν τυφλὰ, ἆρά γε τὰ πρὸς τῷ μεγίστῳ τρήματι τοῦ κρανίου, διὰ οὗ ὁ νωτιαῖος εἰς τοὺς σφονδύλους ἐμβάλλει, ἢ τὰ πρὸς ταῖς ἀκοαῖς, καὶ μικρὸν ἔμπροσθεν παρὰ τὰ ἄρθρα τῆς γένυος. [145] Ἔστι δὲ οὔτε ἐκεῖνα, οὔτε ταῦτα οὕτω τυφλὰ, ὥστε μὴ διατετρῆσθαι, τὰ μὲν εἰς τὸ μέγα κοίλωμα τοῦ νωτιαίου, τὰ δὲ ὑπὸ τὰ ἠθμοειδῆ, καὶ διὰ πάντων αὐτῶν νεῦρα διαπεφυκότα ὁρᾶται, ὑπὲρ ὧν ἐν ταῖς διαιρέσεσιν εἰρήσεται. [146] Ἐοίκασι δὲ τυφλὰ αὐτὰ ὀνομάζειν, ὅτι οὐκ εἰς εὐθὺ φαίνεται διατετρημένα.

[147] Ἐν δὲ τῷ κρανίῳ ἔνεστιν ὁ ἐγκέφαλος· τοῦτον δὲ καλύπτουσιν αἱ μήνιγγες· ἡ μὲν παχυτέρα καὶ ῥωμαλεωτέρα, [ἡ] πρὸς τῷ ὀστῷ· ἡ δὲ λεπτοτέρα, καὶ εὔρωστος μὲν, ἀλλὰ ἧσσον, ἡ πρὸς τῷ ἐγκεφάλῳ. [148] Τὸ δὲ ἄνωθεν τοῦ ἐγκεφάλου, κιρσοειδές· τὸ δὲ κάτωθεν, καὶ ὀπίσω, βάσις· ἡ δὲ ἀπὸ τῆς βάσεως ἔκφυσις, παρεγκεφαλίς· αἱ δὲ κοιλότητες, κοιλίαι ἐγκεφάλου. [149] Ὁ δὲ καλύπτων τὰς κοιλίας ἔνδοθεν χιτὼν χοριοειδής· Ἡρόφιλος δὲ καὶ μήνιγγα χοριοειδῆ καλεῖ. [150] Τὰ δὲ ἀπὸ τοῦ ἐγκεφάλου βλαστήματα, νεῦρα αἰσθητικὰ, καὶ προαιρετικὰ, διὰ ὧν αἴσθησις καὶ προαιρετικὴ κίνησις, καὶ πᾶσα σώματος πρᾶξις συντελεῖται. [151] Τούτων δὲ τῶν νεύρων ἕνια καὶ ἀπὸ τοῦ νωτιαίου μυελοῦ πέφυκε καὶ τῆς μήνιγγος τῆς περὶ τοῦτον. [152] Νωτιαῖον δὲ καὶ ῥαχίτην ὡσαύτως καλοῖς ἂν πάντα τὸν διὰ τῶν σφονδύλων μυελόν.

[153] Τῶν δὲ τοῦ ὀφθαλμοῦ χιτώνων, ὁ μὲν πρῶτος ἐν τοῖς ἐπιφανέσιν ὠνόμασται κερατοειδής· οἱ δὲ ἄλλοι, ὁ μὲν δεύτερος, ῥαγοειδὴς, καὶ χοριοειδής· τὸ μὲν ὑποκείμενον

αὐτῷ τῷ κερατοειδεῖ, ῥαγοειδὴς, ὅτι ἔοικε ῥαγὶ τῇ ἔξωθεν λειότητι, καὶ τῇ ἔσωθεν δασύτητι· τὸ δὲ ὑπὸτῷ λευκῷ, χοριοειδὴς, ὅτι κατάφλεβόν ἐστι τῷ περὶ τῷ ἐμβρύῳ περικειμένῳ χοριοειδεῖ ἐοικός· ὁ δὲ τρίτος περιέχει μὲν ὑαλοειδὲς ὑγρόν· καλεῖται δὲ ἀρχαῖον ὄνομα ἀραχνοειδὴς διὰ λεπτότητα· ἐπειδὴ δὲ Ἡρόφιλος εἰκάζει αὐτὸν ἀμφιβλήστρῳ ἀνασπωμένῳ, ἔνιοι καὶ ἀμφιβληστροειδῆ καλοῦσιν· ἄλλοι δὲ καὶ ὑαλοειδῆ ἀπὸ τοῦ ὑγροῦ· [154] ὁ δὲ τέταρτος περιέχει μὲν τὸ κρυσταλλοειδὲς ὑγρὸν, ἀνώνυμος δὲ ὢν ἐξ ἀρχῆς, ὕστερον φακοειδὴς μὲν διὰ τὸ σχῆμα, κρυσταλλοειδὴς δὲ διὰ τὸ ὑγρὸν ὠνομάσθη.

[155] Τὸν δὲ πρῶτον τοῦ τραχήλου σφόνδυλον, Ἱπποκράτης ὀδόντα δοκεῖ μοι καλεῖν. Τὸ δὲ ὑπὸ ταῖς ἀντιάσιν ὀστοῦν, τὸ περιειληφὸς τὴν κεφαλὴν τοῦ βρόγχου, οἱ μὲν ὑοειδὲς διὰ τὸ σχῆμα ὀνομάζουσιν, ὅτι ἔοικεν τῷ γράμματι· Ἡρόφιλος δὲ παραστάτην καλεῖ, ὅτι παρέστηκε ταῖς ἀντιάσιν. [156] Ἡ δὲ τοῦ δευτέρου σφονδύλου εἰς τὸ ἄνω καὶ ἔμπροσθεν ἀπόφυσις, πυρηνοειδὴς καλεῖται.

[157] Ὧ δὲ τὰ σιτία καὶ τὰ ποτὰ εἰς τὴν κοιλίαν κάτεισι, στόμαχος, καὶ οἰσοφάγος. [158] Καὶ τὰ νεῦρα τὰ ἑκατέρωθεν αὐτοῦ, τόνοι· [159] καὶ τὰ ἄλλα αἰσθητικὰ καὶ ἰνώδη, τόνοι ὡσαύτως. Τῆς δὲ τραχείας ἀρτηρίας [ὅλος ὁ πόρος] καλεῖται βρόγχος· αἱ δὲ εἰς τὸν πλεύμονα ἀποφύσεις, βρογχίαι, καὶ σήραγγες, καὶ ἀορταί.

[160] Ἡ δὲ ἀρχὴ τοῦ θερμοῦ, καὶ τοῦ ζῆν, καὶ τοῦ σφύζειν, καρδία· καὶ ταύτης τὸ μὲν ἄνω, κεφαλὴ, τὸ δὲ ἄκρον καὶ ὀξὺ, πυθμὴν, καὶ τὰ κοιλώματα, κοιλίαι. [161] Ἡ μὲν παχυτέρα καὶ ἐν ἀριστερᾷ, ἀρτηριώδης· ἡ δὲ λεπτοτέρα, καὶ ἐν δεξιᾷ, φλεβώδης· αὕτη δὲ

καὶ εὐρυκοιλιωτέρα τῆς ἑτέρας. [162] Τὰ δὲ ἑκατέρωθεν τῆς κεφαλῆς ὥσπερ πτερύγια κοῖλα, καὶ μαλακὰ, καὶ κινητὰ, ἐν ᾧ πᾶσα σφύζει ἡ καρδία, ὦτα καρδίας. [163] Ὁ δὲ περὶ τὴν καρδίαν χιτὼν περικάρδιος.

[164] Καὶ τὰ ὑπὸ τῶν ὑμένων διαπεφραγμένα τοῦ θώρακος ἐν οἷς ὁ πλεύμων, κενὰ θώρακος. [165] Καὶ οἱ ὑπὸ ταῖς πλευραῖς ὑμένες, ὑπεζωκότες. [166] Καὶ ὁ διαχωρίζων τὰ ἐν τῷ στήθει σπλάγχνα τῶν κάτω, διάφραγμα καὶ φρένες. [167] Ἐκ δὲ τοῦ γένους τῶν ἀδένων, πολλαὶ δέ εἰσιν, αἱ μὲν πρὸς τῷ τραχήλῳ, αἱ δὲ ὑπὸ ταῖς μασχάλαις, αἱ δὲ ἐν τοῖς βουβῶσιν, αἱ δὲ ἐν τῷ μεσαραίῳ, σάρκες τινὲς ἡσυχῇ ὑποπίμελοι καὶ ψαθυραί. [168] Ἐκ τούτων τῶν ἀδένων καὶ ὁ καλούμενος θύμος ἐστὶ, πεφυκὼς μὲν κατὰ τὴν κεφαλὴν τῆς καρδίας, ἐπιβάλλων δὲ τῷ τε ἑβδόμῳ τοῦ τραχήλου σφονδύλῳ, καὶ τοῦ βρόγχου τῷ πρὸς πλεύμονι πέρατι, οὐκ ἐν πᾶσιν ἑωραμένος.

[169] Ὑπὸ δὲ τῷ διαφράγματι, γαστήρ· τὸ δὲ αὐτὸ καὶ ἄνω κοιλία· εἶτα ἡ πρώτη τοῦ ἐντέρου ἔκφυσις, πυλωρός· εἶτα νῆστις· ἔντερον τροφῆς διὰ παντὸς κενὸν, ἀπὸ οὗ καὶ νῆστις ὠνόμασται. [170] Συνεχὲς δὲ τούτῳ τὸ λεπτὸν ἔντερον· ἐκ δὲ τοῦ λεπτοῦ δικραία ἔκφυσις· καλεῖται δὲ τὸ μὲν τυφλὸν, ὅτι ἀληθῶς τυφλόν ἐστιν· τὸ δὲ κόλον, καὶ κάτω κοιλία, ἣν καὶ νειαίρην Ὅμηρος καλεῖ. [171] Ἔστι δὲ ὁ σύνδεσμος τῶν ἐντέρων πᾶς, μεσεντέριον καὶ μεσάραιον· ἀραιὰν δὲ γαστέρα καὶ τὸ σύμπαν ἔντερον πάλαι ποτὲ ὠνόμαζον, ἀπὸ οὗ ἐμμεμένηκεν οὕτως ἔτι καὶ νῦν τὸ μεσάραιον καλεῖν. [172] Ἐπὶ δὲ τῷ κόλῳ τὸ ἀπευθυσμένον πρὸς τὴν ἕδραν καὶ τὸν ἀρχόν. [173] Τὸ δὲ ἐκπεφυκὸς μὲν ἐκ τοῦ περιφεροῦς τῆς γαστρὸς, καλύπτον δὲ αὐτήν τε καὶ μέρος τι τοῦ ἄλλου ἐντέρου, ἐπίπλοον. [174] Καὶ ὁ ἀπὸ τῶν φρενῶν περὶ πάντα τὰ ἔντερα χιτὼν τείνων, περιτόναιον.

[175] Ἡ δὲ παρὰ τὴν πρώτην τοῦ ἐντέρου ἔκφυσιν κειμένη σὰρξ διαπίμελος καὶ ἀδενώδης, πάγκρεας.

[176] Ἐκ δὲ τῶν δεξιῶν τῆς κοιλίας, ἦπαρ. [177] Τοῦ δὲ ἥπατος, τὰ μὲν τῶν φρενῶν καὶ [τοῦ] περιτοναίου ψαύοντα, κυρτά· τὰ δὲ κάτωθεν καὶ τῆς γαστρὸς ψαύοντα, σιμά. [178] Καὶ ἐπὶ τοῦ μεγίστου λοβοῦ χολῆς ἀγγεῖον· τούτου δὲ τὸ μέσον στενὸν, αὐχήν· τὸ δὲ κάτω, πυθμήν. [179] Πύλη δὲ ἥπατος ἡ φλὲψ, διὰ ἧς ἡ τροφὴ εἰσέρχεται. [180] Ἃ δὲ ἐν ἱεροσκοπίᾳ, πύλας, καὶ τράπεζαν, καὶ μάχαιραν, καὶ ὄνυχα καλοῦσιν, ἔστι μὲν καὶ ἐν ἀνθρώπῳ, ἀσαφῆ δὲ καὶ οὐκ εὔδηλα, καὶ εἰς οὐδὲν ἰατρικὸν ἀναγκαίως ὀνομασθέντα.

[181] Ἐκ δὲ τῶν ἀριστερῶν τῆς κοιλίας, σπλήν· καὶ τού του τὸ παχὺ καὶ ἀνωτάτω, κεφαλή. [182] Πρὸς δὲ ταῖς ἐσχάταις πλευραῖς νεφροὶ δύο· καὶ ἀπὸ τούτων οὐρητῆρες δύο, οἵ τινες εἰσβάλλουσιν εἰς τὴν κύστιν. [183] Ἔστι δὲ ἡ κύστις, εἰς ἣν τὸ οὖρον τὸ ἐκ τῶν νεφρῶν καὶ τῶν οὐρητήρων καταῤῥεῖ, καὶ ἀπὸ τῆς κύστεως ὁ τράχηλος, καὶ τὸ ὑπόστημα, καὶ ἡ τραμὶς, καὶ τὰ ἄλλα τὰ ἤδη εἰρημένα.

[184] Τὰ δὲ σπερματικὰ ἀγγεῖα ἔστι μὲν τέσσαρα, δύο μὲν κιρσοειδῆ, δύο δὲ ἀδενοειδῆ· ἐκαλοῦντο δὲ καὶ γόνιμοι φλέβες. [185] Καὶ τῶν κιρσοειδῶν, τὰ πρὸς τοῖς διδύμοις, παραστάται· ἐνίοις δὲ καὶ πάντα παραστάτας καλεῖν διαφέρει οὐδέν.

[186] Σκεπτέον δὲ καὶ εἰ τοῖς θήλεσι τὰ αὐτὰ πεποίηται, ὥσπερ καὶ τοῖς ἄῤῥεσιν· Ἡροφίλῳ μὲν γὰρ οὐ δοκεῖ τὸ θῆλυ κιρσοειδεῖς ἔχειν παραστάτας· ἐν δὲ προβάτου ὑστέρᾳ εἴδομεν ἐκ τῶν διδύμων πεφυκότα τὰ ἀγγεῖα κεκιρσωμένα ἑκατέρωθεν·

συνετέτρητο δὲ ταῦτα εἰς τὸ κοίλωμα τῆς ὑστέρας, ἀπὸ ὧν ὑπόμυξον ὑγρὸν πιεζούντων ἀπεκρίνετο· καὶ ἦν πολλὴ δόκησις σπερματικὰ ταῦτα εἶναι, καὶ τοῦ γένους τῶν κιρσοειδῶν. [187] Τοῦτο μὲν δὴ οἷόν ἐστιν, αἱ ἀνατομαὶ τάχα δείξουσιν.

[188.] Οἱ δὲ μύες οἱ ἔνδοθεν τῆς ὀσφύος, ψόαι, οἵπερ καὶ μόνοι τῆς ἄλλης ῥάχεως τῇ ὀσφύι παραπεφύκασιν. [189] Ἄλλοι δὲ νευρομήτρας καλοῦσιν·[190] ἄλλοι δὲ ἀλώπεκας. Τοῦτο ἄρα ἦν καὶ τὸ ἐν ταῖς Κνιδίαις γνώμαις γεγραμμένον· ἐὰν δὲ νεφρῖτις ἔχῃ, σημεῖα τάδε· ἐὰν οὐρῇ παχὺ, πυῶδες, καὶ ὀδύναι ἔχωσιν ἔς τε τὴν ὀσφὺν καὶ τοὺς κενεῶνας, καὶ τοὺς βουβῶνας, καὶ τὸ ἐπίσειον, τοτὲ δὲ καὶ ἐς τὰς ἀλώπεκας. [191] Ὧ καὶ δῆλον ὅτι χρήσιμον τὰ τοιαῦτα εἰδέναι εἰς διάγνωσιν τῶν οὕτως ὠνομασμένων. [192] Κλείταρχος δὲ τοὺς ἔξω κατὰ τῆς ῥάχεως μύας, ψόας, καὶ νευρομήτρας, καὶ ἀλώπεκάς φησι καλεῖσθαι οὐκ ὀρθῶς.

[193] Τῆς δὲ γυναικὸς τὸ γεννητικὸν μόριον, μήτρα, καὶ ὑστέρα· Ἱπποκράτης δὲ καὶ δελφὺν, καὶ γονὴν καλεῖ. [194] Καὶ αἱ ἐπὶ τὰ ἄνω ἔνθεν καὶ ἔνθεν ἐκφύσεις, κεραῖαι, καὶ πλεκτάναι, καὶ τὰ ἀνέχοντα αὐτὴν ἀγγεῖα ἐκτός. [195] Καὶ τὸ μέσον καὶ ἀνωτάτω, πυθμήν· καὶ τὰ ἑκατέρωθεν, ὦμοι· καὶ τὸ ἄκρον, αὐχὴν καὶ τράχηλος· τραχήλου δὲ τὸ στόμα, ὁ πρῶτος πόρος· Ἱπποκράτης δὲ καὶ ἀμφίδιον ὀνομάζει ἀπὸ τῶν κυκλοτερῶν σιδηρίων τῶν πρὸς τοῖς ἀρότροις.

[196] Εἶτα τὸ κοίλωμα τὸ ἐφεξῆς, γυναικεῖος κόλπος, καὶ αἰδοῖον τὸ σύμπαν σὺν τοῖς ἐπιφανέσιν. [197] Περὶ δὲ τοὺς διδύμους εἰσὶ χιτῶνες ἐλυτροειδεῖς καὶ δαρτοὶ, καὶ νεῦρον

εἰς τὸν δίδυμον καθῆκον κοῖλον, ὃ καὶ ἀορτὴρ καὶ κρεμαστὴρ καλεῖται, καὶ φλεβία διὰ ὧν τρέφονται οἱ δίδυμοι· καὶ ταῦτα τρέφοντα τὸν δίδυμον καλεῖται.

[198] Τῶν δὲ ἄλλων φλεβῶν τὰ ὀνόματα, τὸ μὲν κατὰ παντὸς εἰπεῖν,τὰ λεπτὰ τῷ χιτῶνι ἀγγεῖα καὶ ἔναιμα φλέβες καλοῦνται, καὶ πᾶσαι αἱ μεγάλαι, κοῖλαι. [199] Ὕστερον δὲ διὰ ἔθους ἔσχον οἱ ἰατροὶ κοίλην ὀνομάζειν, τήν τε ἀπὸ τοῦ ἥπατος ἐπὶ [τοὺς] νεφροὺς πέμπουσαν τὰς ἀποφύσεις, ἔνθα φησὶν ὁ Πραξαγόρας τὴν πρώτην ἀρχήν·εἶναι τῶν πυρετῶν· καὶ οὗτος κοίλην μόνην ταύτην καλεῖ· ἄλλοι δὲ καὶ τὴν ἄνω διὰ τῶν φρενῶν ἐπὶ καρδίαν τείνουσαν· οἱ δὲ καὶ ταύτην τε καὶ τὴν προτέραν ἑνὶ ὀνόματι ἡπατῖτιν ὠνόμασαν· καὶ τὴν ἀπὸ τοῦ σπληνὸς, σπληνῖτιν. [200] Ἀλλὰ οὐκ ἔστιν ἀπὸ τοῦ σπληνὸς, ὥσπερ ἀπὸ τοῦ ἥπατος ἄνω καὶ κάτω διὰ τῶν ἀριστερῶν πεφυκυῖα φλὲψ, ἀλλὰ τοῦτο ψευδόμενοι λέγουσιν· τὰ δὲ ἐπὶ τὸν σπλῆνα τείνοντα φλεβία, λεπτά τέ ἐστι, καὶ αὐτὸν πρὸς τὸν σπλῆνα περαίνεται. [201] Φιλιστίων δὲ ὁ ἐξ Ἰταλίας, κατὰ τὸ ἐπιχώριον τοῖς ἐκεῖ Δωριεῦσι, ἀετούς τινας ὀνομάζει φλέβας, τὰς διὰ κροτάφων ἐπὶ κεφαλὴν τεινούσας. [202] Ἱπποκράτης δὲ τὰς ἀπὸ καρδίας εὐθεῖς δρακοντίδας ὀνομάζει. [203] Ἡρόφιλος δὲ ἀρτηριώδη φλέβα τὴν παχυτάτην καὶ μεγίστην τὴν ἀπὸ τῆς καρδίας καλεῖ φερομένην ἐπὶ τὸν πλεύμονα·ἔχει γὰρ ὑπεναντίως τῷ πλεύμονι πρὸς τὰ ἄλλα.

[204] Αἱ μὲν φλέβες ἐνταῦθα ἐῤῥωμέναι καὶ ἐγγυτάτω τὴν φύσιν ἀρτηριῶν· αἱ δὲ ἀρτηρίαι ἀσθενεῖς, καὶ ἐγγυτάτω τὴν φύσιν φλεβῶν. [205] Ἐπανθισμοὺς δὲ πρῶτος μὲν ὧν οἶδα ὠνόμασε Διονύσιος ὁ τοῦ Ὀξυμάχου· καί φησιν ὁ Εὔδημος λέγεσθαι τὴν φλέβα, ἐπανθισμόν. [206] Ἐμοὶ δὲ δοκεῖ Διονύσιος ἐοικὸς μέν τι φλεβὶ τὸν ἐπανθισμὸν ὀνομάζειν, οὐ μὴν αὐτόφλεβα, ἀλλά τι ἄλλο ἐπίκτητον ἀγγεῖον αἵματος. [207] Δηλοῖ δὲ

πολλάκις ἐν τῷ αὐτῷ φλέβα, καὶ ἐπανθισμὸν, καὶ ἀρτηρίαν ὀνομάζων· οὐ γὰρ ἂν, εἴπερ ταὐτὸν ἦν φλεβὶ, οὕτως ὠνόμαζεν· εἴ γε μηδέν ἐστιν ἕτερον παρὰ τὴν φλέβα ἐπανθισμός, ἀλλὰ ἐκεῖνός γε ᾤετο, καὶ οὕτως ἐκάλει.

[208] Τὰς δὲ ἀρτηρίας τὸ ἀρχαιότατον φλέβας ὠνόμαζον· καὶ σφύζειν ὁπότε λέγοιεν τὰς φλέβας, ἀρτηρίας ἐβούλοντο καλεῖν· ἀρτηριῶν γὰρ τὸ σφύζειν ἔργον· ἔλεγον δὲ καὶ ἀορτὰς καὶ πνευματικὰ ἀγγεῖα, καὶ σήραγγας, καὶ κενώματα, καὶ νεῦρα. [209] Ἀορτὴν δὲ Ἀριστοτέλης ἐξαιρέτως τὴν διὰ τῆς ῥάχεως ἀρτηρίαν ὀνομάζει, ἥ τις μεγίστη παρατέταται τῇ ῥάχει· ταύτην δὲ παχεῖαν Πραξαγόρας εἴθισται καλεῖν. [210] Καρωτίδας δὲ τὰς διὰ τοῦ τραχήλου κοίλας ὠνόμαζον πάλαι, ὅτι πιεζόντων καρώδεις καὶ ἄφωνοι ἐγίνοντο· ὤφθη δὲ νῦν τὸ πάθημα οὐ τῶν ἀρτηριῶν, ἀλλὰ νεύρων αἰσθητικῶν πεφυκότων πλησίον· ὥστε εἰ ἐθέλοις μεταθεῖναι τοὔνομα, οὐκ ἂν ἁμαρτάνοις.

[211] Νεῦρα δὲ, τὰ μὲν ἀπὸ ἐγκεφάλου καὶ νωτιαίου, πρακτικὰ καὶ αἰσθητικὰ, καὶ προαιρετικὰ, καὶ τόνοι· τὰ δὲ περὶ τὰ ἄρθρα συνδετικά. [212] Αἱ δὲ παχεῖαι ἐκ τοῦ ἰνίου ἐκφύσεις, καὶ τὰ εἰς τὴν πτέρναν ἐκ τοῦ μυὸς ἐκφυόμενα, τένοντες. [213]Χόνδροι δὲ τὰ ἐπὶ τοῖς πέρασι τῶν ὀστῶν·σκληρότερα δὲ τῶν νεύρων. [214] Ὑμένες δὲ τὰ λεπτὰ καλύμματα·χιτῶνες δὲ τὰ παχύτερα τῶν καλυμμάτων. [215] Πιμελὴ δὲ τὸ λιπαρώτατον πῆγμα τῆς τροφῆς.

[216] Σὰρξ δὲ τὸ ἐν τοῖς σπλάγχνοις μεταξὺ τῶν ἀγγείων πεπηγὸς, ἅμα ὑφή τις καὶ πλήρωμα τοῦ πλέγματος τῶν ἀγγείων, ὡς μὴ κενὰ τὰ μεταξὺ ᾖ· καὶ ἡ τῶν μυῶν, ἰνώδης, καὶ στερεά· καὶ ἡ ἐπὶ τοῖς ἕλκεσι καὶ τοῖς κοιλώμασι τῶν ὀστῶν ἄρτι πηγνυμένη. [217]

Μυελὸς δὲ ὁ μὲν ἐν τῇ ῥάχει, ῥαχίτης·ὁ δὲ διὰ νώτου, νωτιαῖος, καὶ ἡ περὶ αὐτὸν μῆνιγξ, νωτιαία· ὁ δὲ ἐν τῷ κρανίῳ, ἐγκέφαλος· ὁ δὲ ἐν τοῖς ἄλλοις ὀστέοις, ὀστίτης, ἐάν τε ἐν μεγάλοις ἐνῇ κοιλώμασιν ὥσπερ ἐν μηρῷ, καὶ ἐν βραχίονι, ἐάν τε ἐν σήραγξιν, ὥσπερ ἐν πλευραῖς καὶ κλεισίν.

[218] Αἷμα δὲ ὁ θερμότατος καὶ ξανθότατος χυμός. [219] Φλέγμα δὲ τὸ λευκὸν καὶ παχὺ, καὶ ἡσυχῇ ἁλυκὸν περίσσωμα. [221] Τοῦτο δὲ ὅταν αὐανθῇ, μέλαν φλέγμα. [222] Χολὴ δὲ, ξανθὴ μὲν, τὸ πικρὸν καὶ ξανθὸν περίσσωμα· πρασοειδὴς δὲ, ἡ ὀξεῖα καὶ ὑπόχλωρος· ἰώδης δὲ, ἡ ἰσχυρῶς κατακορὴς καὶ ἄκρατος· μέλαινα δὲ, ἡ ὑποστάθμη τοῦ αἵματος.

[223] Ἄλλοι δὲ τὸ μέλαν αἷμα, μέλαιναν καλοῦσιν. —Τὰ δὲ ὑπόλοιπα περισσώματα, σίελος μὲν ἡ τοῦ στόματος ὑγρότης· μύξα δὲ τὸ ἁλμυρὸν περίσσωμα τοῦ ἐγκεφάλου· ἱδρὼς δὲ ἡ κατὰ πᾶν τὸ σῶμα ὑγρότης· οὖρον δὲ τὸ ἐν κύστει νιτρῶδες ὑγρὸν κατιόν· φῦσα δὲ τὸ ἐν τοῖς ἐντέροις περισσὸν πνεῦμα· κυψελὶς δὲ ὁ ἐν τοῖς ὠσὶ ῥύπος· καταμήνιον δὲ αἱ ἐν ταῖς θήλεσιν ἐπὶ μηνὶ αἱματώδεις ἐκκρίσεις· ὅταν δὲ λευκὰ ἐπιφέρηται, καταμήνιον οὐ καλεῖται, ἀλλὰ ῥοῦς. [224] Γάλα δὲ ἡ ἐν τοῖς μαστοῖς πέψις τῆς τροφῆς. [225] Σπέρμα δὲ καὶ θορὴ καὶ γόνος τὸ αὐτὸ, ἡ ἐν παραστάταις γεννητικὴ πέψις ὁμοῦ πνεύματος καὶ τροφῆς.

[226] Πραξαγόρας δὲ ἴδιον τρόπον τοὺς χυμοὺς ὠνόμαζε, γλυκὺν, καὶ ἰσόκρατον, καὶ ὑαλοειδῆ· τούτους μὲν κατὰ τὴν ἰδέαν τοῦ φλέγματος· ἄλλους δὲ ὀξὺν καὶ νιτρώδη, καὶ ἁλυκὸν, καὶ πικρόν· τούτους δὲ ὡς γευσαμένῳ φαίνονται· ἄλλους δὲ, πρασοειδῆ μὲν τῇ

χρόᾳ, λεκιθώδη δὲ τῇ παχύτητι· ἄλλους δὲ, ξυστικὸν μὲν, ὅτι ξύεσθαι παρασκευάζει· στάσιμον δὲ, ὅτι ἐν ταῖς φλεψὶν ἐνέστηκε, καὶ οὐ διαδίδωσιν εἰς τὴν σάρκα, διὰ τὸ λεπτοὺς καὶ φλεβώδεις εἶναι τοὺς στασίμους χυμούς. [227] Τὸ δὲ ὅλον, χυμὸν ὁ Πραξαγόρας πᾶν τὸ ὑγρὸν καλεῖ· ὁ δὲ Μνησίθεος, τοῦτον μὲν χυλὸν, τὴν δὲ γευστικὴν δυνάμιν, ἐάν τε ἐν ξηρῷ, ἐάν τε ἐν ὑγρῷ ᾖ, χυμόν. [228] Θερμασίαν δὲ καὶ πνεῦμα Ζήνων μὲν τὸ αὐτὸ εἶναί φησιν οἱ δὲ ἰατροὶ διαιροῦσι, πνεῦμα μὲν τὸ ἀναπνεόμενον· θερμὸν δὲ τὴν ἔκτριψιν τοῦ πνεύματος· οἱ δὲ ἀρχήν τινα ζωῆς.

[229] Τὸ δὲ βρέφος περιέχεται χιτῶσι, τῷ μὲν λεπτῷ καὶ μαλακῷ·ἄμνιον αὐτὸν Ἐμπεδοκλῆς καλεῖ· ἐντεῦθεν, μοι δοκεῖ, καὶ ἡ Εἰλείθυια Ἀμνιὰς ἐπωνόμασται, μᾶλλόν περ ἢ ἀπὸ τοῦ ἐν Κρήτῃ λιμένος. [230] Ἑωρῶμεν δὲ ἀνατέμνοντες τοῦτον τὸν χιτῶνα περιέχοντα ὑγρὸν, πολὺ δὴ καθαρώτερον τοῦ ἐν τῷ χορίῳ· καὶ λογιζομένοις μὲν ἐφαίνετο ὥσπερ ἱδρὼς εἶναι τοῦ βρέφους, τὸ δὲ διὰ τοῦ οὐράχου ὥσπερ οὖρον εἰς τὸ χορίον ἐκδιδόναι. Ἀλλὰ ὁ μὲν ἄμνιος ἔνδοθεν ἦν καὶ περὶ τῷ βρέφει· [231] τὸ δὲ χορίον ἔξω καὶ περὶ τῇ ὑστέρᾳ τραχὺς καὶ φλεβώδης χιτών. [232] Ἐκ δὲ τοῦ χορίου ἐκπεφύκει ὁ ὀμφαλὸς, δύο φλέβες καὶ δύο ἀρτηρίαι, καὶ πέμπτος ὁ καλούμενος οὐραχὸς, ἀγγεῖον βραχὺ καὶ ἀμφίστομον ἀπὸ τοῦ πυθμένος τῆς κύστεως εἰς τὸ χορίον ἐμβάλλων.

[233] Τὰ μὲν πλεῖστα τοῦ ἀνθρώπου οὕτω χρὴ καλεῖν· εἰ δέ τι ἐν τούτοις καὶ παραλέλειπται, οὐ μὴν δίκαιον τὰ πολλὰ ἀτιμάσαι διά τινα ὀλίγα παροφθέντα.

Translation of Rufus' *On the Names of the Parts of the Body*

[1] First of all, what must you know to practice cithara playing? Being able to touch and name each one of the chords. [2] And what must you know to practice grammar? Discerning and naming each of the letters. [3] The same is also true for the other arts, for which we begin to learn the names: the metalworker, the leather-cutter, and the carpenter. First one learns the names of iron and carrying-pails and all of the other objects used for that craft. [4] And what about the other more serious skills? Do they not begin with the discovery of the names of things? [5] What do you learn first in geometry? Knowing and correctly naming the point, the line, the plane, the surface, the shape of a triangle, the circle, and other similar things.

[6] Do you also want to learn medical science, beginning first with nomenclature? Do you want to list each of the parts of the body, and then other matters which follow from this discussion? Or does it seem sufficient to you that I simply show you what I ought to teach you, as if you were deaf? [7] This does not seem better to me. It will not enable you to learn it yourself or to teach it to others. [8] At least, that is how it seems to me. [9] If you listen and look at this slave, you will, first of all, commit to memory the external, visible parts. And then, when it becomes necessary to discuss the internal parts, we shall investigate the animal (*viz*. monkey) which appears most like man. I will try to teach you each of their chief parts, so that nothing is hidden from you. However, not everything is

shared between the two animals. [10] And long ago, one learned these things best on man.

[11] The largest parts of the body are the following: the head, the neck, the trunk, the arms, and the legs. We call the "thorax" not only the part which extends from the collarbones to the navel, but that which extends from the collarbones to the genitalia. [12] One calls the "head" either that which is covered in hair or that which is part of the face. [13] The front of the head is the area opposite the hair; the occipital bone is the area in back. On either side of the crown are the *korsai* or temples. The topmost point is where the hair attaches most firmly to the head. That which is situated below the crown is the forehead. [14] We call "whiskers" hair located on the sides of the temples and the "mane" hair that falls at the nape of the neck. [15] The lowest hair on the front of the face, "the brow," is that which we draw together overtop of our eyes when we think or feel ashamed. [16] The other hairs which we see under the fleshy rim of the eye are called "eye brows." [17] They are on the furthest extreme on the front of the face. [18] The "*mesophruon*" is the space between the brows.

[19] Below the eyebrows are the eyelids --one higher, one lower. Among the hair which emerges here are the bristles at the edge of the eyelids and the lashes. [20] The furthest ones which touch one another when we sleep are called "crowns" or "ridges." "The groove" is the part atop the upper lid. [21] The extreme depressions near the upper and lower lids are the corners of the eyes. [22] The largest of these is near the nose; the

smallest, near the temples. [23] The parts in the middle of the eye are the eyeball and pupil. [24] And they call “the socket” the image that appears in the eyeball.

[25] The iris is that which extends from the pupil to the white part of the eye. They say that the color of the iris is black, tawny, bluish-green, or bluish-gray. [26] “The crown” (ciliary muscle) encircles the black and separates it from the white. [27] It is a circle and the link for the membranes of the eye; these membranes have two names, since they have two natures. The external, horn-like coating of the eye extends from the midpoint to the iris and is so named because it resembles polished horn. All the rest of the eye which we see is the white part, and it is in no way like the middle of the eye -- either by its structure or by its color. [28] The part that lies below it is called the epidermis. And among both the young and the old, during illness or when the conjunctivae are swollen, one sees a reddened area here, which appears dark and puffy. [29] Through the dissection of the monkey, we can discuss how to name all the other membranes of the eye. [30] The bony projections under the eyes are called “the anterior margins;” the others are called “black eyes.”

[31] The nose extends from the midpoint of the face. [32] The openings of the nose are called “sinuses” and “nostrils.” [33] The Athenians call the phlegmatic secretions of the nose *muxes*, while Hippocrates calls them *muxa*. The Athenians refer to the condition of having nasal secretions as a “cold.” [34] The cartilaginous section between the nostrils is called “the partition of the nose.” [35] And the bony projection, with cheeks on either side, is called “the bridge of the nose.” [36] The endpoint of this bony projection forms

"the wings" on either side of the nose. These wings stir during extreme shortness of breath, but they can also be willed to move. [37] "The column" is the fleshy part in front of the partition of the nose which reaches down to the lip. [38] The end of the nose is "the sphere." [39] The philtrum is the groove below the partition of the nose and on top of the upper lip. [40] The whole area below the nose and above the lips is "the base of the nose" (infratip lobule). [41] There are two lips whose outermost projections are called "lobes of the lips." The meeting point of the lips is the front of the mouth. [42] The depression below the lower lip is the labret (*numphe*).

[43] The act of hearing is accomplished by the channel of the ears. Aristotle reports that the lobe, the dangling part of the ear, is the only one to have a name; the other parts are unnamed. [44] But some doctors *have* named the other parts. "The wing" is the broad area which is inclined upwards. From there, the helix marks out the periphery of the ears. The anti-helix is the prominence on the cavity in the middle of the ear. "The conch" is the cavity in front of the anti-helix. The tragus is the prominence opposite the conch, by the edges of the temples. And the anti-lobe is the somewhat rough area at the end of the helix.

[45] They call "the face" the entire area on the front of the head. [46] The cheeks are the raised sections of the face under the eyes which blush when we feel embarrassed. [47] Coming from the cheeks are the ridges; they are called either the "jaw-bone" or simply the "jaw." The jaw is also known as the upper and lower mandibles. [48] The point of the lower jaw is known as the *geneion* (chin) or *anthereon* (chin). The fleshy part under the

lower mandible is called the *leukania* (throat). Others call this area the *antherion* (throat) and label the *leukania* the cavity near the collar-bone. [49] The first appearances of a beard under the temples are called "whiskers." The hairs that grow on the upper lip are called a moustache. Those on the point of the chin are called "bristles." And those under the jaw are called a "goatee."

[50] The mouth is both the front opening of the lips and the connected opening which extends to the pharynx. [51] In the mouth, among other things, are the teeth. Some people also call them *krantarai*. The four teeth in the front are the incisors. The canines are next, one on each side. The molars or grinder-teeth come after the canines and number five on each side. The wisdom teeth are the most internal and furthest back. They are so called because they grow on either side when we begin to acquire wisdom. [52] The upper jaw is equipped for these teeth; the lower jaw is similarly equipped and has the same name. [53] The frenulum is the joint between the upper and lower jaw. [54] "The tables" are the flat part of the molars. [55] The sockets or "racks" are the hollows of the jaw, to which the teeth attach. [56] The gums are the flesh around the roots of the teeth. [57] The "root" of the tongue is the point from which it extends. The muscular part within the mouth is called the tongue. The connection point is the throat. "The yokes" are on both sides of the tongue. The *hypoglottis* is the part in the back.

[58] The epiglottis is posterior and covers the larynx, so that nothing chances upon the lungs when we drink. But it is raised when we breathe, so that nothing hinders respiration. [59] "The sky" or palate is the vault of the upper jaw. [60] "The pillar" or

uvula is the protuberance projecting from the palate. [61] Aristotle calls it a "grape carrier" because, when it is inflamed, it seems like a bit of grape is suspended from it. But the label "grape" should not be used for the body part, but rather the disease associated with it. [62] The pharynx or *pharygethron* (throat) is the entire open space used for swallowing. [63] Homer wrote these verses:

> Wine and human smoke escape from the pharynx.[59]

It is not the food and drink which the Cyclops releases from his throat and lung. That would be amazingly unheard-of and senseless.

[64] The fleshy and glandulous outgrowths (tonsils) located on each side of the pharynx are known alternatively as: (1) glands issuing from the isthmus, (2) glands on opposing ends, and (3) apples. [65] There are four glands: those located on either side of the top of the larynx and those which are adjacent and lower down (amygdala).

[66] After the head is the neck; it is also called "throat" and "gullet." The base of the neck (hypodeiris) is the endpoint of the front of the neck. [67] The front part of the neck, called the throat or the trachea, is the vessel through which we breathe. The prominence of the throat is the larynx. On the back of the neck are the tendons. [68] Homer calls the hollow near the collar-bone the "white area," while doctors call it the throat and jugular.

[59] *Od.* IX.373-4.

[69] The parts descending from the tendons (of the neck) to the upper arms are the shoulders. [70] The shoulder, the head of the upper arm, is near the shoulder blade and the entire joint of the arm. [71] The socket of the shoulder is the hollow of the shoulder blade. The shoulder blades are the broad bones resting upon the back. The projection of bone in the middle of the shoulder blades is the spine. [72] The point of the shoulder is the link between the collar bones and the shoulder blades. [73] Eudemius says that it is a small ostellette. [74] The clavicles are the bones under the neck. Fastened near the chest, they prevent the shoulders and shoulder blades from falling together, as they do in other animals. For they (the animals) do not have clavicles. It is for this reason that man has the broadest chest.

[75] The armpit is the hollow under the shoulder, where the shoulder most often slips. [76] It is not Greek to use the word "underarm" for "armpit." But for someone who hides something under his armpit, it is possible to say that he carries it under his underarm.

[77] The arm comes immediately after the shoulder. The curvature by the shoulder, the prominence which extends towards the forearm, is called the head of the arm. Certain people following Hippocrates wrongly consider it to be an outgrowth of the forearm and also the head of the arm. [78] After the arm comes the elbow, which is both the whole joint and the point upon which we rest when we prop ourselves up. [79] Some authors call it the *olekranon* (point of the elbow). The Dorians, who live in Sicily call it the *kubiton*. Epicharmos uses the word *kubizein* to describe striking with the elbow. [80] Of the bones of the elbow, the inferior one is the ulna and the one above that is the radius.

These bones terminate at the wrist. [81] After the wrist, are the flat, fused parts of the hand, the metacarpus and tarsus. Following these are the fingers.

[82] "Hand" implies everything below the wrist with which we take hold of something. [83] The largest of the fingers is set apart from the others. The first of the four remaining fingers is the pointer finger. Then come the middle finger, the one adjacent to the middle finger, and the little finger. [84] The bones of the fingers are called the "sticks" and phalanges. The first joints are called the procondyles; then the condyles, and lastly the metacondyles. [85] "The roots" are the origin of the nails. Nails are the "grapes" and highest points on the outer reaches of the fingers. [86] The chest is the fleshy area which, after the big finger, arises under the hollow of the hand. [87] The palm is the fleshy space between the pointer finger and the large finger, below the hollow of the hand. The "under-hand" is the area under the four fingers. [88] It seems to me that Hippocrates calls the "palm" the entire spread of the hand.

[89] After the clavicles, the chest is the middle region which appears next. The sternum is the area towards which the sides of the body extend. [90] The back is the part in the rear which extends from the neck to the midriff. The midriff extends between the back and the loins, towards the diaphragm. The loins end at the tailbone. [91] The fleshy prominences on the chest are called breasts and teats. The end of the breast is the nipple. [92] The first growth of the breast during puberty is called a "bean." When it is fully developed, it is called a "swelling." [93] This terminology is only appropriate for women.

[94] One labels “the side” the entire area under the armpit. The sides are the bones, and the intercostal space is the area between the bones. The “false sides” are those which do not arrive directly at the sternum. [95] The depression under the chest is called the mouth of the belly. Some call it the “fore-heart”, and others, the “heart.” And the ailments there are known as stomach wailing and stomach pain. [96] The cartilage marks the ends of the false sides. And the “under-cartilege” are the muscles beneath the cartilage.

[97] The belly or stomach comes next. The “over-belly” is the skin atop the stomach. [98] The navel is in the middle of the belly; it functions as the endpoint of the veins, through which the embryo is fed. In the middle of this hollow is the point of the navel. [99] The skin stretching under the navel is called “old,” because it is a sign of old age when that skin wrinkles. [100] The part under the navel is called the lower belly and abdomen. Some call what extends from the abdomen to the genitals the pubic region and pubic bones; others call it the pubis.

[101] Of the genitals, the part which hangs down in men is called the “stem” and shaft. That which does not hang down is called the base and the neck of the bladder. And the medial line is the perineum. Others call it the “penis” [102] The extremity of the organ is the glans, and the skin around it is the foreskin. The extremity of the foreskin is the “endpoint.” [103] The channel through which sperm and urine escape is called the ureter, or the passageway of sperm. But it is not necessary to call this channel the “ureter.” For ureters are passages for other things, not just channels for the flow of urine.

[104] The testicles are within the loins. It makes no difference whether one calls them "twins" or "testicles." [105] The upper part of the testicles is called the head; the lower part, the base. [106] The area hanging down from the loins is the scrotum. [107] The Athenians refer to someone who is always slack as "having a hanging scrotum". [108] The region between the scrotum and the neck of the bladder and thigh is called the perineum.

[109] As for the genitals of a woman, the triangular end of the lower stomach is called the pubic region. [110] Others call it the pubis. The cleft is the division of the genitals. [111] The muscular area of flesh in the middle is the "young girl" or "myrtle berry." Some call it the "under-skin" and others, the "clitoris." And they call "clitorizing" the lustful touching of this area. [112] The myrtle lips are the fleshy areas on either side; Euryphron also calls them crags. Now we use the words "wings" for "myrtle leaves" and "young girl" for myrtle.

[113] The spondyles are the bones of the spine. Homer also calls them vertebrae. The bony growth of the spondyles are call the backbone. [114] The last bone at the bottom of the back is a sacred bone. The extremity of this bone is called the coccyx. [115] The areas under the sides are known as the iliac cavity and flank. Then come the bones of these cavities, and their hollows are called cotyles.

[116] The fleshy area below the lower back, upon which we sit, is called the buttocks. Others call them gluteal muscles. The area below the gluteals is called the juncture

between the buttocks and thighs. [117] The groin is the area in front of the thighs by the pubis. [118] The sciatic nerve is the nerve near the hip and the entire joint. [119] The sides of the thighs are the internal region of the thighs, and the mid-thighs are located between the thighs. [120] The word "rectus femoris" describes the muscles above the knee; while "patella" describes the bones above the knee. Hippocrates calls it the *epimulis*. The knee is the joint of the thigh above the tibia. [121] And the hamstring is the posterior region which we use to bend the knee. [122] The gastrocnemius is the large muscle on the back of the leg, from which the broad nerve (the Achilles tendon) extends towards the heel.

[123] Of the bones of the leg, the tibia is internal. And the bone on the foreside of the leg is the shin. The tibia is on the outside. Herophilus calls the tibia the "rod of the leg." [124] The end of both these bones, the area near the feet, is called the *sphron* (ankle) or -- incorrectly -- the ball of the ankle. For a man's foot also has an ball under the ankle, but it is not visible. [125] The heel is the posterior area surrounding the foot, while the "field" or sole is the broad area in the front. The chest is the lower region of the foot, below the arch, from which the digits emerge. [126] Nothing prevents our calling both the toes and their analogue on the hand "digits." For the same name is equally applicable to both.

[127] These, then, o child, are the visible parts -- along with their underlying bones -- that it is necessary for us to name. We attempt to name the internal parts by dissecting the monkey, since monkeys are most similar in nature to man -- in terms of their bones, muscles, viscera, arteries, veins, and nerves. The second most similar are the animals

which have feet divided into many digits. Third are the cloven-hoofed animals that have a double row of teeth. Those that do not have cloven-hoofs and have only a single row of teeth are most unlike man. [128] If we have already described these parts along with the visible ones, then it is not necessary to discuss them a second time.

[129] Next you see the membrane under the skin of the head. This is called the pericranium. We use the word "periosteum" to describe this same membrane on other bones. [130] The junctures of the cranial bones are called sutures; they are like the joining of two saws. One suture is circular and circumscribes the coronal suture. Another is the lamboidal suture, and a third is at the top of the head (sagittal suture). [131] In some people, this suture passes through the coronal suture and arrives finally at the space between the eyebrows. [132] These last two sutures join together with the bones of the temples like scales. [133] The names of these sutures are not old, but the current names were given by certain Egyptian doctors who speak Greek badly. The coronal is the suture at this spot. The lamboidal circumscribes the back of the skull, having joined at the middle of the head. And the "scales" are located around the temples.

[134] These doctors named parts of the cranial bones, which were once nameless. I will not pass over these names because they reveal the current conventions of doctors. [135] The diploid is the spongy area between the cranial bones, from which the nose extends. [136] The many openings in it are called the ethmoid bones. Doubtless, it is through this structure that sneezes and mucus escape the nose. And some even say that we draw breath to the brain with it.

[137] The bones near the ears are known to be stony in form, because they are most durable. [138] On each side there is also a hard and whitish bone, just like the head of the hand, through which the channels of the ears pierce. [139] Some call the stony projections which reach down to the nape of the neck the "mastoid bone," but they do so incorrectly. For the projections are hollow, not firm, as their name suggests. [140] The projections which extend from the ears towards the cheekbones are called the arcus zygomaticus.

[141] The muscles in the hollows of the temporal bones are called temporalis muscles. And those around the lower jaw are the masseter muscles. [142] The slender and long prominences, which descend towards the pharynx are called styloid processes. [143] Eudemus likened them to a cock's spur, but he later abandoned that name.

[144] There are many orifices that run through the head. All are unnamed except two, and these are called "blind." Doctors differ amongst themselves whether it is necessary to call them this Some think the orifices are the location through which the spinal fluid passes to the vertebrae; others think they go towards the ears, not far from the joints of the lower jaw. [145] But the orifices are neither of these, and they do not spread in different directions. They form a large column of the hollow below the ethmoid bone. And across all these orifices, we see nerves that have branched out; this is apparent in dissections. [146] It seems like they should be called blind because they are not branched directly.

[147] The brain is located within the head, and the meninges cover it. One of the meninges is thicker and stronger and is attached to the bone (dura mater). The other is thinner and strong -- but less so -- and is attached to the brain. [148] The upper part of the brain (cerebrum) is called "varicose," and the lower and posterior part of the brain is the "base." The part that extends from the base is the cerebellum. The hollows are called the belly of the brain (ventricles). The part internally covering the ventricles is the choroid plexus. [149] Herophilus also calls it the choroid membrane. [150] The offshoots of the brain are the sensory and motor nerves, and through these, sensing, motion, and indeed the entire activity of the body, is accomplished. [151] Of these nerves, there are some that emerge from the spinal fluid and from the meninges surrounding them. [152] One can describe equally well with the words "fluid of the back" and "spinal fluid" all the fluid traveling through the vertebrae.

[153] Of the ocular membranes, the first one that is apparent is the cornea. Among the others, the second, is the grape-like membrane (choroid membrane). And after that, then we find a fetal membrane. The name "grape-like" is given to the former because, on the outside, it seems smooth like a grape, and on the inside, it is rough. The second membrane, the part under the whites of the eye, is so-named because it is vascular like the membrane surrounding the fetus. The third membrane, the crystalline, surrounds the vitreus. Its ancient name is the "arachnoid membrane" because of its fineness. Herophilus likened it to a drawn-up net, and some other doctors called it net-like. The fourth membrane surrounds the crystalline vitreus. [154] Initially, it was nameless, but later it

was called “lenticular” because of its shape and “crystalline” because of the liquid within it.

[155] It seems to me that Hippocrates calls “tooth” the first vertebra of the neck. The bone which is under the tonsils and which surrounds the head of the larynx is called by some doctors the “hyoid” because of its shape, which resembles the letter upsilon. Herophilus calls it the “judge” because it convenes around the tonsils. [156] The prominence of the second vertebra, which is located higher up and in front, is called “pyre-shaped.”

[157] The stomach or esophagus is the area through which food and drink travel to the belly. [158] And the nerves on either side (pneumogastric nerves) of it are called “chords.” [159] The other sensitive and fibrous nerves are similarly called chords. The entire passageway of the windpipe (arterial trachea) is called the bronchus. And the extensions towards the lungs are called bronchiae, caves, and aortai.

[160] The heart is the principle of heat, life, and the pulse. The upper part of it is called the head; the outmost and sharpest part is the base; and the hollows are called ventricles. [161] The thicker cavity on the left (left ventricle) is called arterial, and the one on the right (right ventricle) is called “venous.” The right ventricle is more capacious than the left. [162] The wing-like hollows on either side of the heart, which are soft and move with the pulse in the entire heart, are called the cardiac ears. [163] The pericardium is the membrane surrounding the heart.

[164] The partitions of membranes in the thorax, which are located in the lung, are called hollows of the thorax. [165] The pleura are the membranes over the lungs. [166] And the part separating the organs in the chest from those below it is called the diaphragm or *phrenes* (thorax). [167] Among the glands, of which there are many kinds, some are near the neck. Others are located under the armpits, in the groin, and in the mesentery. These ones are fleshy, somewhat fatty, and brittle. [168] The thymus is one of these glands, originating at the head of the heart and drawing towards the seventh vertebra of the neck, at the outskirts of the bronchus near the lung. It is not present in all animals.

[169] Under the diaphragm is the stomach or the upper hollows. Next, the first outgrowth of the intestine is the pylorus. Then we find the intestine jejunum ("hungry"), so named because it is empty of all food. [170] The thin intestine follows this and has two outgrowths. One is called the caecum because, truthfully, it is blind. The other is called the colon and the lower stomach, or in Homer, the lower belly. [171] The link among the entire intestine is the mesenterium or *mesaraion*, because long ago, the entire intestinal area was called the "narrow" stomach. And it is from this word that we have our current appellation. [172] In the colon, the right hand side (rectum) heads towards the seat or foundation. [173] The omentum is an offshoot from the periphery of the stomach, which, together with another part of the intestines, covers it. [174] And the membrane which extends from the diaphragm and covers the entire intestine is called the peritoneum. [175] The fatty and glandular flesh which lies near the first outgrowth of the intestine is the pancreas.

[176] On the right of the stomach is the liver. [177] The part of the liver touching the diaphragm and peritoneum is convex, while the part lower down touching the stomach is concave. [178] And on the large lobe is the vessel of bile. The narrow, central part of it is the neck; the part at the bottom, is the base. [179] The entrance of the liver is the vein through which food enters. [180] During the inspection of sacrificial victims, these entrances are called alternatively "gates," "tables," "daggers," and "nails." They are also present in humans, but they are indistinct and hardly apparent, and it is not necessary that they have a medical name.

[181] The spleen is located to the left of the stomach. The thick and highest part of it is called the head. [182] On the outer edges of the lungs are the two kidneys; from the kidneys, arise the two ureters, which travel towards the bladder. [183] The bladder is the organ into which urine flows from the kidneys and ureters. After the bladder, come the neck, base, perineum, and other parts which I have already named.

[184] There are four spermatic vessels; two are varicose, and two are glandular. [185] They are also called "generating veins." The parts of the varicose vessels which approach the testicles are called "assistants." But among some authors, all the vessels are called *parastatai* without distinction.

[186] It is necessary to make an investigation into these same parts in women, as we did in men. It did not seem to Herophilus that women had vascular assistants. But we see that

on the uterus of ewes, vascular vessels emerge from either side of the testicles. They open into the hollows of the uterus (fallopian tubes), and if we press these hollows, a slightly mucosal fluid runs out. It is a great supposition that these are spermatic vessels of the vascular kind. [187] Perhaps dissections will show what sort they are.

[188] The muscles inside of the loins are the psoas; they are the only muscles in the entire spinal area which are located near the loins. [189] Some call them the *"*mother of nerves," while others call them "foxes." [190] This last term is used in a sentence of Cnidias: "If there is nephritis, the following signs will be present: if the urine is thick and full of pus; and if pain is present in the loin, flanks, groin, and pubis, it is in the 'foxes.'" [191] From this sentence, it is clear that we need to know the range of terms in order to recognize how they are named in various instanced. [192] Cleitarchus incorrectly labeled the psoas as follows: (1) muscles external to the spine, (2) the mother of nerves, and (3) foxes.

[193] The generative part of a woman is called "the mother" or *"*uterus." Hippocrates also called it womb and generator. [194] The prominences on the top of the uterus on both sides are called horns and spires; these terms are also used for the external vessels. [195] The central and raised area is the base, and the "shoulders" (uterine wall) are on either side. The topmost point is the isthmus or neck, and the opening of the neck is the first passageway (external orifice). Hippocrates calls it the "plow," because it is like the circle of iron on a plow.

[196] The next opening is the female sinus (vagina), and we call "shameful" the entire area around it. [197] Around the woman's "testicles" are case-like and incised membranes. A hollow nerve also gives way to the testicles. This nerve is called the "cord" and "suspension." We also encounter veins which carry food through them; these are called the nourishing testicular veins.

[198] As for the other veins, we can truly call "veins" those vessels which are narrow and contain blood; all the large vessels are called "hollows." [199] Later on, doctors were in the habit of calling the "hollow" the vein which sent extensions from the liver to the kidneys. Praxagoras says that this area is the point of origin of fiery heat, and he wants it, alone, to be called the hollow. But others use the term for the vein which stretches upward from the diaphragm to the heart. And there are some who use the word "hepatic" for both of these veins. [200] But unlike the liver, the spleen has no offshoots on the left, extending either upwards or downwards. Those who make this claim are incorrect. The veins which extend to the spleen are narrow and, in fact, end at the spleen. [201] Philistion of Italy, following the custom of the Dorians in that area, called "eagles" certain veins which extend through the temples on the head. [202] Hippocrates called "little dragons" the veins coming straight from the heart. [203] And Herophilus used the phrase "arterial veins" to describe the thick and large vessels traveling from the heart to the lungs.

[204] Veins in the lungs behave in a different way than veins located elsewhere. The veins in the lung are hardy and are similar in nature to arteries, but the arteries there are

feeble and are similar to veins. [205] Dionysius, son of Oxymachus, was the first person to my knowledge to "efflorescing veins", and Eudemus says that we call them by this appellation. [206] But it seems to me that Dionysius was using the word to describe something similar to a vein -- not a vein itself -- but perhaps some vessel newly filled with blood. [207] This is clear when he frequently describes with the same word the veins, *epanthismos,* and artery. But it makes no difference whether he uses this word or "vein," if indeed they describe the same thing. If veins and efflorescing veins are not different, Dionysius used this word and names them accordingly.

[208] A long time ago, arteries were called veins. And when we say that veins beat, we should be calling these vessels "arteries," as it is the task of arteries to beat. They are also called aortas, pneumatic vessels, hollows, openings, and nerves. [209] Aristotle specifically named the artery which runs down the spine the "aorta;" it is the largest artery lying upon the spine. Praxagoras described it as "thick." [210] Long ago, the vessels going through the neck were called "carotid" (sleep-inducing) because, when pressed, they would induce stupor and muteness. But now we know that these afflictions are not caused by the arteries, but by protrusions of the sensory nerves. And if we wanted to swap their names, we would not be amiss.

[211] The active and sensory nerves emerging from the brain and spine are *proairetika* (voluntary) and are called "cords." [212] Others nerves bind the joints. The cords projecting from the nape of the neck, as well as the one escaping from the muscle (calf) to the heel (Achilles tendon) are called "tendons." [213] Cartilage is located at the

periphery of the bones and is stronger than the nerves. [214] Delicate membranes are called "thin skin," and thicker membranes are called "coverings." [215] Congealed fat is the oiliest part.

[216] Flesh is the solid material in the viscera between the vessels. At the same time, it is also a sort of web and padding for the weaving of the vessels, so that there is no empty space between them. The flesh of the muscles is fibrous and sturdy. And that on top of sores or in the hollows of the bones is called a "thickening." [217] The marrow in the spine is called "spinal marrow." The marrow going through the back is called "dorsal marrow," and its meninx is known as the "dorsal meninx." The one in the head is the encephalitic meninx, and in the other bones, the collective term is "osteo-meninges." Either they are located in the large cavities, like the thigh and arms, or they are in the small cavities, like the sides and collar bone.

[218] Blood is the hottest and most yellow humor. [219] Phlegm is a white, thick, and somewhat salty secretion. When it dries, it becomes black phlegm. [220] Bile is called "yellow" when it is a bitter and yellow-colored secretion; "leek-green" if it is sour and greenish; and "rust-colored" if it is excessively strong and unmixed. [221] Black bile is a repository of blood. [222] Some authors call black bile "black blood."

[223] The other remaining secretions are (1) saliva, the fluid of the mouth; (2) mucus, the salty discharge from the brain; (3) sweat, the watery fluid from the entire body; (4) urine, the fluid in the bladder that is like carbonate of soda; (5) gas, the air that is formed in the

intestines; and (5) earwax, the accretions in the ears. Menses are the blood-red secretions that we see in women each month. When this discharge is white, it is called "flow," not menses. [224] Milk in the breasts is the concoction of food. [225] Sperm, semen, and the seed itself, which are located in the testes are generative and are the result of the simultaneous concoction of *pneuma* and food.

[226] Praxagoras described the humors in a unique way: He labeled them mild, temperate, and transparent, according to the appearance of the phlegm. He also called them sour, carbonated, salty, and bitter, according to their taste. Based on color, they could be leek-green; and based on thickness, they could be like pulse-porridge or even "scraped." Or they might seem churned. "Stagnant" are those humors that remain in the veins and do not pass through the flesh. Indeed, the stagnant humors are thin and reside only in the veins. [227] In general, Praxagoras calls the entire liquid area juice. Menestheos uses the word "digestive juice" for this, while he uses "juice" for the sense of taste – whether in dry or wet substances. [228] Xeno says that heat and *pneuma* are the same thing. But some doctors make a distinction and claim that *pneuma* is respiration, and heat is the rubbing of *pneuma*. Others say that heat is a certain beginning of life.

[229] The fetus is wrapped in membranes. One of these is thin and soft; Empedocles calls it the amniotic fluid. It seems to me that it is from this name that Eileithuia has the surname "Amnias," not from the name of a port in Crete. [230] In dissecting this membrane, we have found a liquid surrounding it which is much clearer than that surrounding the fetus. [231] For anyone contemplating it, it looks just like sweat from the

fetus, and it travels through the urachus, like urine which arrives at the fetal membrane. The amniotic fluid covers the fetus from within, while the membrane is an external, rough, and venous structure. [232] The umbilical chord extends from the membrane. It has two veins and two arteries and a fifth vessel called the urachus. This last vessel is short and has two openings going from the base of the bladder to the membrane.

[233] These, then, are the majority of the terms that should be used to describe the parts of the human body. If anything among these has been omitted, it would be unjust to hold the bulk of terms in contempt simply because a few have been neglected.

1-3 ὁ χαλκεὺς, καὶ ὁ σκυτοτόμος, καὶ ὁ τέκτων: Galen has a low opinion of these banausic professions, and tries to cast himself as a doctor at a higher level. But the reference to the "more serious skills" to follow does suggest that Rufus is also putting medicine on a higher level too. On the kithara in medical literature, see Galen. *De Semine*.2.3.581.7, and *De Tremore*.7.606.2; 7.606.4; 7.639.16.

5 γεωμετρίᾳ: Geometry, music, and grammar all would have counted as part of the most basic level of education.

6 Βούλει: It is unclear to whom Rufus is speaking, as no one is addressed directly.

9 ἀποβλέπων εἰς τὸν παῖδα τοῦτον: A clear sign that he is lecturing to students.

9 ζῶόν: There are many references in Galen and others to the similarities of monkeys/apes to men. In particular, Galen's *Anatomical Procedures*.2.218 suggests that the ape is like man in terms of his viscera, muscles, arteries, veins, nerves, and bones.

27. The modern term for this space between the eyebrows is the "glabella."

29 ἐν τῇ διαιρέσει τοῦ ζῴου: The implication here is that they have not yet dissected the monkey.

33 Ἀθηναῖοι: It is unclear whether this is a reference to Athenian doctors or simply a reference to Attic usage.

38. The philtrum is the medial cleft, which in many mammals goes from the nose to the upper lip. In humans and other primates, it is just a vestigial depression.

43. The labret, or depression between the upper lip and chin, is also referred to as the *numphe* in Galen.*UP*.15.3. Hesychius of Alexandria, the 5th century CE author of a lexicon of rare Greek words, also uses *numphe* to refer to the lip. See Poll.2.90 Hsch.

49 ἡ μὲν ὑπὸ τοῖς κροτάφοις πρώτη βλάστησις, ἴουλος: This discussion of a beard is ndication that the slave to which Rufus is pointing is a man.

49 ἴουλος: The slave's whiskers are a sign of how Rufus divides up the stages of life: this seems to correspond to the ephebate.

51 σωφρονιστῆρας: This is another sign of how Rufus views the process of aging. The last teeth to come in man are molars called 'wisdom-teeth', which come at the age of twenty years, in the case of both sexes. Cases have been known in women upwards of eighty years old where at the very close of life the wisdom-teeth have come up, causing great pain in their coming; and cases have been known of the like phenomenon in men too. This happens, when it does happen, in the case of people where the wisdom-teeth

have not come up in early years. According to Aristotle *HA*.2.1, males have more teeth than females.

53. The frenulum is the fold of tissue surrounding the jaw.

61. Arist. *HA.* 493a3

74 διὰ τοῦτο καὶ ἄνθρωπος πλατυστερνότατος: In his *HA*.II.1, Aristotle notes that the chest of man is broad, but that of all other animals is narrow

75 Μασχάλη: For other instances of this usage, see Aristoph. *Lysist.* 985; Plato. *Georg.*469d1; *Tim.*67b7, 77d6; *Leges* 789b3; and Plut. *Quaest.Conv.*612c-748a, all of which use *maschala* for hiding something under one's armpit.

79 Δωριεῖς δὲ οἱ ἐν Σικελίᾳ: It seems like Rufus is referring to an earlier period in Sicilian history. He seems to be showing off a little here.

79 Ἐπίχαρμος: 540-450 BCE was a Greek dramatist and philosopher who originated the Doric or Sicilian comedic form. He is mentioned in Diogenes Laertius. *Vitae Philos.*8.178, Plato *Gorgias* 505e and *Theaetetus* 152e, and Hipp.*De Morbis Popularibus*5.1.20.1; 7.1.119.1.

85 ῥᾶγες: This is the same word in Greek as used previously, though Rufus objected to its use above.

88 Δοκεῖ δέ μοι Ἱπποκράτης πᾶν τὸ πλατὺ τῆς χειρὸς θέναρ ὀνομάζειν: This is corroborated in Hipp.*De Fract.*4.11; 8.19; 14.3; 15.34; and 19.17.

89 The Hippocratic corpus uses μαστοὶ less frequently than τιτθοί. See *De.Morb.*2.3.17.14 and *Epist.*23.46 for the former and *De.Morb.*2.1.6.22; 2.1.6.18, and *Prorrr.*2.26.4; 2.26.10 for the latter.

92 κύαμος: Again, another section on the various stages of aging. See Hipp.*Mulier.*1.46.8 and Hipp.*Off.*3.290.5.

93 κυριώτερον δὲ ἐν γυναικί: A particularly gendered comment, but probably not much to be made from it. The reference here suggest that the slave is male, as if to acknowledge that what he is saying should not be applied to the slave's body in front of the audience.

97 In the Hippocratic corpus, as in Rufus' text, "γάστηρ" can mean both the belly of the digestive system or the womb of the reproductive system. In non-medical texts, we also find these two alternatives. See Herod.3.32 and Homer *Il.*6.55.

98 Ὀμφαλὸς: Rufus assigns a central status to the navel. Varro assigns this status to the genitals instead.

99 ὅτι ῥυτιδούμενον γῆρας σημαίνει: This usage is attested in Pollux.*Onom.*2.170.2 and Orib.*Coll.Med.*2.5.1.41.1.

101 τῶν αἰδοίων: It appears that the slave on display is both male and naked.

104 διδύμους δὲ ἢ ὄρχεις καλεῖν οὐδὲν διαφέρει: Indeed, the Hippocratic corpus uses both terms. For the former, see *Epid.*VII.452; *Vict*.I.6.504.14.22l and *Nat.Puer.*7.540.19.17. And for the latter, see *Epist.*23.46.

107 Ὃ δὲ ἀεὶ χαλαρὸν, λακκοσχέαν τοῦτον Ἀθηναῖοι καλοῦσιν: This is noted in Lucian's *Lexiphanes* 12.2.

111 κλειτοριάζειν: For this verb form, see Diog.*Gramm.Paromiae* 5.77.1 and Pollux.*Onom.*2.17.5. Aristotle indicates an awareness of the clitoris at *GA* 728a32-4, though he never suggests its involvement in women's sexual pleasure.

112 Εὐρυφῶν (c. 5th century BCE) was a Greek physician from Cnidos. Soranus (*Vita Hippocrates)* describes him as an older contemporary of Hippocrates. Galen claims that he was the author of the *Knidiai Gnommoi* (Commentary in Hipp. *De Morb. Vulgar.*

VI.1, 29, vol xvii). And from a passage in Caelius Aurelianus, it appears that he knew the difference between arteries and veins (*de Morb, Chron* ii,10).

113 Ὅμηρος δὲ καὶ ἀστραγάλους αὐτὰ καλεῖ: Homer uses this word in *Il.*14.466; *Il.*23.88; *Od.*10.560; and *Od.*11.65.

114 ἱερὸν ὀστοῦν: so-called because of its resemblance to a sacred vessel. Hipp.*Art.*47.

120 Ἱπποκράτης δὲ ἐπιμυλίδα ὀνομάζει: Pollux, in *Onom.*2.189.2, reports that this usage is Hippocratic.

123 Ἡρόφιλος (335-280 BCE) – a Greek physician, born in Calchedon. He was the first to perform dissections and is Rufus' most-cited physician.

124 ἔχει μὲν γὰρ καὶ ἀστράγαλον ὁ ποὺς τοῦ ἀνθρώπου ὑπὸ τῷ σφυρῷ, κἂν οὐκ ἐμφανῆ: The astragalus or ankle bone is largely hidden under articular cartilage. See White (2005), 292.

127 Τὰ μὲν οὖν ἐπιφανῆ, ὦ παῖ, σὺν τοῖς ὑποκειμένοις ὀστοῖς οὕτω χρὴ καλεῖν τὰ δὲ ἔνδον τουτονὶ τὸν πίθηκον ἀνατέμνοντες, ὀνομάζειν πειρασόμεθα: It appears that the dissection beginning now.

127 ὦ παῖ: It is unclear whether Rufus is addressing an audience member ("o child," as I have rendered it) or his anatomical prop ("o slave"). But since Rufus uses the second-person singular in his preface when asking about how one learns names, I have kept translated the noun as "child."

130 Τὰς δὲ συμβολὰς τῶν ὀστῶν τοῦ κρανίου, ῥαφὰς καλοῦσιν· ἐοίκασι δὲ δυοῖν πριόνων συνθέσει: The coronal suture receives treatment in Hipp.*Epid.*V.226.10.15 and *Prorrh.*I.5.558.7.

133 νῦν ἐτέθη ὑπό τινων Αἰγυπτίων ἰατρῶν φαύλως ἑλληνιζόντων: A derogatory reference to ethnic Egyptians (as opposed to Alexandrians; see n.134), and it is telling to see Rufus dismissing them as not really Greek.

134 τὰ νῦν τῶν ἰατρῶν δήλωσιν: Rufus seems to be a little nostalgic for the days when Alexandrian physicians could perform dissections.

135 Διπλόη: Hipp.*Epid.*V.5.214.23 and *Morb.*II.7.14.25.

137 λιθοειδῆ: Hipp.*De.Sem.*55.29.

143 Εὔδημος δὲ εἰκάζει μὲν αὐτὰς ἀλεκτρυόνων πλήκτροις, ἀνωνύμους δὲ ἐᾷ:
An erudite piece of trivia. It is not clear how Rufus would know this.

145 Ἔστι δὲ οὔτε ἐκεῖνα: Rufus is perhaps drawing his audience's attention to where he is pointing on the monkey's body.

153 ἀραχνοειδὴς: Hipp.*Prog.*2.142.7

155 Τὸν δὲ πρῶτον τοῦ τραχήλου σφόνδυλον, Ἱπποκράτης ὀδόντα δοκεῖ μοι καλεῖν: Hipp.*Nat.Puer.*7.498.15.

169 νῆστις: The jejunum is the second part of the small intestine. It is found empty of food, as it is where carbohydrates and protein are absorbed.

170 τυφλὸν: The caecum is a pouch which receives feces from the small intestine and delivers it to the large intestine. The suggestion that it is "blind" relates to the fact that the connection between the colon and intestine is so small that it appears to dead-end at the caecum.

170 ἣν καὶ νειαίρην Ὅμηρος καλεῖ.: For the Homeric references, seee *Il.*5.539; *Il.*5.616; and *Il.*17.519.

171 ἀραιὰν δὲ γαστέρα καὶ τὸ σύμπαν ἔντερον πάλαι ποτὲ ὠνόμαζον, ἀπὸ οὗ ἐμμεμένηκεν οὕτως ἔτι καὶ νῦν τὸ μεσάραιον καλεῖν: Another reference to the development of new names for body parts. The mesentery is the membrane suspending

the the jejunum. It sits below the stomach and colon and is much narrower. See Kibble (2009), 262.

180 ἐν ἱεροσκοπίᾳ: Here we have reference to another setting where dissections would be performed, and the anatomical knowledge that might be gained there.

180 ἔστι μὲν καὶ ἐν ἀνθρώπῳ: A sign of Rufus' own work on living patients, presumably.

186 ἐν δὲ προβάτου ὑστέρᾳ εἴδομεν ἐκ τῶν διδύμων πεφυκότα τὰ ἀγγεῖα κεκιρσωμένα ἑκατέρωθεν: Rufus seems to be aiming towards the idea that women are imperfect men, and that their genitals are underdeveloped versions of male genitalia.

186 καὶ ἦν πολλὴ δόκησις σπερματικὰ ταῦτα εἶναι: A reference to female sperm. Galen is a proponent of this idea.

186 The Hippocratics knew of the fallopian tubes but believed they went to the bladder. See Von Staden (1989), fr.61. Galen was the first to note explicitly that they ended at the womb. See *De Uteri Diss.* CMG v.2.1 p.48).

187 Τοῦτο μὲν δὴ οἷόν ἐστιν, αἱ ἀνατομαὶ τάχα δείξουσιν: Rufus seems almost wistful here. And it is a sign that he adheres to an experimental methodology, even if he has not gone far enough to test it out on a human subject.

188 Ἄλλοι δὲ νευρομήτρας καλοῦσιν: Though who these "others" are is unclear, the usage is attested in Pollux.2.185.2.

190 The Cnidian school was equal in antiquity with the Coan. It was said by Galen to have distinguished diseases in each organ: seven in the gall bladder, twelve in the urinary bladder, four in the kidneys, two in the thigh, and five in the foot.[60] The best known physician of the school was Euryphon. Menon says he attributed diseases to residual nutriments which travel to the head.[61] Most of what we know of the Cnidians is from the criticism of the *Cnidian Sentences* by the author of *Regimen in Acute Diseases* I-II, as well as some remarks by Galen. The critic says that the Cnidians attached little importance to prognosis but cared too much about the classification of diseases.[62]

192 Κλείταρχος (4th cent. BCE), an early biographer of Alexander the Great

193 Ἱπποκράτης δὲ καὶ δελφὺν, καὶ γονὴν καλεῖ: The Hippocratic mentions references in *Mul.*I.8.114.15; *Erot.*27.10.

193 Another popular metaphor for womb in the Hippocratic texts is that of a jar. See *Epid.*6.5.11. *Gen.*9 (L.7.482) suggests the womb is like a jar and that the child, like a plant, will grow to fill it.

[60] Galen.*On Method of Healing.*XV.427. For more on the Cnidian school, see J.Ilberg (1924) *Die Ärzteschule von Knidos Berichte über die Verhandlungen der sächsischen Akademie der Wissenschaften*. Leipzig.
[61] Galen.*Regimen.*XV. 455.
[62] Galen.XV.427.

194 κεραῖαι: The reference to "horns" was used by both Herophilus and Galen to indicate the fallopian tubes, though the Hippocratics seemed not to use this term. See Von Staden (1989), 232-3.

197 Περὶ δὲ τοὺς διδύμους: This term for "testiscles" is being applied to female anatomy.

199 Πραξαγόρας: from Cos (4th cent. BCE): studied anatomy and was a teacher of Herophilus. Instead of the traditional four humors, he identified eleven. He viewed arteries as air tubes, similar to the trachea and bronchi and argued that arteries issued from the heart, while veins originate at the liver.

201 Δωριεῦσι: Ancient usages of Western Greeks, as previously. And it is another sign of his attention to Dorian versus Attic usage.

201 Φιλιστίων: from Locri (4th cent BCE): He was a physician and medical author. He argued that what is imbibed travels to the lungs (Plut, *Symp.* vii, 3)

202 Ἱπποκράτης δὲ τὰς ἀπὸ καρδίας εὐθεῖς δρακοντίδας ὀνομάζει: This reference to "little dragons" is in *Nat.Mul.*7.358.3.

205 Διονύσιος ὁ τοῦ Ὀξυμάχου:(3rd or 4th cent. BCE): a contemporary of Eudemus, who wrote an anatomical treatise. This is a rather learned digression but receives corroboration in Orib.*Med.*13.i.2.

210 The carotid artery provides blood to the brain, and interruption to its flow results in loss of consciousness. See Kibble (2009), 210.

211 Νεῦρα δὲ, τὰ μὲν ἀπὸ ἐγκεφάλου καὶ νωτιαίου, πρακτικὰ καὶ αἰσθητικὰ, καὶ προαιρετικὰ, καὶ τόνοι: Reference to the nerves as "voluntary" is Alexandrian, not Hippocratic. See Galen *De.Oss.ad.Tir.*2.739.10; *De.Nerv.Diss.*2.831.2; and *De.Loc.Affect.*8.169.2.

218 This emphasis on the humors is Hippocratic in origin. Someone is well when his four humors: blood, phlegm, yellow bile, and black bile are in the proper amount. See *Nat.Hom.*4 (vi.38.19) and *Morb.*4.32 (vi.1.542).

226 Πραξαγόρας: For more on this individual, see note 199.

229 Eileithuia was the goddess of childbirth. Her cult center was at Amninos in Crete, the purported site of her birth. See Pausanias' *Description of Greece* 1. 18. 5 (trans. Jones): "Near the Prytaneion or Town Hall of Athens] is a temple of Eileithyia, who they say came from the Hyperboreans to Delos and helped Leto in her labour; and from Delos the name spread to other peoples. The Delians sacrifice to Eileithyia and sing a hymn of Olen. But the Kretans suppose that Eileithyia was born at Amnisos in the Knossian territory [in Krete], and that Hera was her mother. Only among the Athenians are the wooden figures of Eileithyia draped to the feet. The women told me that two are Kretan,

being offerings of Phaidra, and that the third, which is the oldest, Erysikhthon brought from Delos."

228 Ζήνων (2nd cent. BCE): a physician of the school of Herophilus.

229 Ἀμνιὰς: Empedocles uses similar word-play in a biological context: the word "*amnion*" describes the membrane around the fetus. See also Pollux.*Onom.*ii.2225.i.155.8.

230. διὰ τοῦ οὐράχου: The urachus is a fetal organ; it functions as a canal to drain the urinary bladder of the fetus.

Greek Text of Rufus' *On the Anatomy of the Parts of the Body*

[1] Παραδόντες τὴν τῶν ἔξωθεν θεωρουμένων ὀνομασίαν, ἑξῆς νῦν ἐπὶ τὴν τῶν ἐντοσθίων μεταβαίνωμεν γνῶσιν· ἔοικε γὰρ κατὰ τοὺς σοφοὺς οἱονεὶ μικρὸς κόσμος ὁ ἄνθρωπος, ἀντίμιμος τῆς οὐρανίου τάξεως, ποικίλην ἔχων δημιουργίαν ἀποτελεσμάτων ἔν τε τῇ τῶν μερῶν κατασκευῇ, καὶ τῇ τῶν ἔργων ἐκβάσει· παιδευτέον οὖν καθάπερ τὰ ἄλλα τὰ κατὰ τὴν ἰατρικὴν, οὐτωσὶ δὴ καὶ τὰ κατὰ ἀνατομὴν θεωρήματα. [2]Τῆς οὖν τέχνης ἀρχὰς διδασκαλίας οἱονεὶ ὑποβάθραν ποιούμενοι, ἐκθησόμεθα ἣν παρέσχε τοῖς μέρεσιν ἡ φύσις θέσιν τε καὶ ὀνομασίαν.

[3] Ἐν τῇ κεφαλῇ τοίνυν περιέχεται κατὰ τὴν κοιλότητα τοῦ κρανίου σὺν ταῖς περὶ αὐτὸν μήνιγξιν ὁ ἐγκέφαλος, κατὰ σύγκρισιν πρὸς τὰ ἄλλα τῶν ζῴων ὡς ἐπὶ ἀνθρώπου μείζων ὑπάρχων· ἀθαρώδης καὶ γλίσχρος τὴν σύγκρισιν, καὶ διάλευκος, ὑπὸ ᾧ πρὸς τὸ ἰνίον τέτακται ἡ λεγομένη παρεγκεφαλίς. [4] Τῶν δὲ μηνίγγων, ἡ μέν τίς ἐστι προστυπὴς τῷ τοῦ κρανίου ὀστῷ, ἣ καὶ σφυγμικῶς κινεῖται· δευτέρα δὲ ἡ περὶ αὐτὸν ἡ σκέπουσα τὸ λελυμένον αὐτοῦ καὶ διακατέχουσα τὴν σύστασιν. [5] Αὗται δέ εἰσι νευρώδεις καὶ ὑμενώδεις, ποσήν τε αἴσθησιν ἔχουσαι, καὶ πλοκὰς ἀγγείων. [6] Ἀκίνητος μὲν ἡ ἐνδοτέρω, εὐκίνητος δὲ καὶ παχυτέρα ἡ ἐπάνω. [7] Ἀπὸ δὲ τοῦ ἐγκεφάλου γίγνεται ἀπόφυσις τοῦ μυελοῦ διικνουμένη διὰ τοῦ τρήματος τοῦ κρανίου κατὰ τὸ ἰνίον, καὶ διὰ τῆς τῶν σφονδύλων κοιλότητος διοχετευομένη διὰ πάντων ἄχρι τοῦ τελευταίου, οὐκ ἰδία σύστασις, ἀλλὰ ἀπόῤῥοια ἐγκεφάλου· καλεῖται δὲ νωτιαῖος μυελός. [8] Ἐκφύσεις δέ εἰσι πόρων ἀπὸ τοῦ ἐγκεφάλου διήκουσαι νευρώδεις κατὰ ἕκαστον αἰσθητήριον, οἷον ὦτα, ῥῖνας, καὶ τὰ λοιπά. [9] Μία δὲ ἀπὸ βάσεως φέρεται ἔμπροσθεν ὡς διῃρημένη διχῇ,

προκύπτει τε εἰς ἑκάτερον τῶν ὀφθαλμῶν κατὰ τὴν λεγομένην πυελίδα καὶ βοθρώδη κοιλότητα τοῦ προσώπου, παρὰ ἑκάτερα τῆς ῥινὸς, ἔνθα ἡ τῶν χιτώνων τῶν τὸν ὀφθαλμὸν συνυφαγκότων πλοκὴ γέγονε τοιαύτη. [10] Ὧν ὁ πρὸ πάντων τεταγμένος, ἀπὸ μὲν τῆς τάξεως ὠνόμασται πρῶτος· ἀπὸ δὲ τῆς χροιᾶς, λευκός· καλεῖται δὲ ὁ χιτὼν πρῶτος λευκός· [ὁ] αὐτὸς καὶ κερατοειδὴς, ἤτοι διὰ τὴν εὐτονίαν, ἢ διὰ τὸ λάμπειν τὸ παρακείμενον ὑγρὸν ἔνδοθεν ὡς διὰ κέρατος, [11] ἢ διὰ τὸ κέρατι παραπλησίως εἰς κτηδόνας ἀναλύεσθαι. Δεύτερος δὲ χιτὼν ἔστι προστυπὴς τῷ πρώτῳ γενόμενος κατὰ προσάρτησιν ἄχρι τῆς λεγομένης στεφάνης, ὃς κατὰ τὴν ἑαυτοῦ μεσότητα διάστασιν σώζει, καὶ τέτρηται κυκλοτερῶς. [12] Τὸ δὲ τετρημένον σῶμα, λεῖον μέν ἐστιν ἔξωθεν, κατὰ ὃ προσπίπτει τῷ κερατοειδεῖ· δασὺ δὲ ἀπὸ τῶν ἀπεστραμμένων, ὥς φησιν Ἡρόφιλος, δορᾷ ῥαγὸς σταφυλῆς ὅμοιον, καταπεπλεγμένον ἀγγείοις. [13] Καλεῖται δὲ δεύτερος μὲν τῇ τάξει, τετρημένος δὲ ἀπὸ τῆς κατασκευῆς, καὶ ῥαγοειδὴς ἀπὸ τῆς ἐμφερείας, καὶ χοριοειδὴς, ὡς ὁμοίως χορίῳ κατηγγειωμένος. [14] Ὁ δὲ τρίτος ἀπὸ τοῦ αὐτοῦ πόρου προελθὼν περιέχει ὑγρὸν [ᾧοῦ] τῷ λευκῷ παραπλήσιον, καλούμενον ὑαλοειδές. [15] Ἔστι δὲ λεπτὸς ἄγαν οὗτος· καλεῖται δὲ ἀπὸ μὲν τῆς τοῦ ὑγροῦ πήξεως, ὑαλοειδής· ἀπὸ δὲ τῆς λεπτότητος, ἀραχνοειδής· ἀμφιβληστροειδὴς δὲ διὰ τὴν τῶν ἀγγείων καταπλοκὴν καὶ τὸ σχῆμα· ἀπὸ γὰρ στενοῦ εἰς πλάτος ἀνευρύνεται, καὶ κοιλαίνεται πρὸς παραδοχὴν τοῦ τετάρτου χιτῶνος ὃς ὑγρὸν περιέχει κρυστάλλῳ παραπλήσιον, οὗ τὸ μὲν ἥμισυ προκύπτει συνεχὲς ὑπάρχον τῷ τοῦ δευτέρου τρήματι· τὸ δὲ ἥμισυ σύγκειται τῷ ἀραχνοειδεῖ. [16] Οὗτος τοίνυν κέκληται δισκοειδὴς, καὶ φακοειδὴς ἀπὸ τοῦ σχήματος· κρυσταλλοειδὴς δὲ ἀπὸ τῆς τοῦ ὑγροῦ πήξεως. [17] Τοῦτον δὲ οὐκ ἀξιοῦσί τινες χιτῶνα ὀνομάζειν· ἐπίπαγον [18.] δέ τινα ὑμενώδη λέγουσιν εἶναι.

[18] Ἑξῆς μετιτέον ἐπὶ τὰ ἐν τῷ στόματι παρακείμενα. [19] Ἡ μὲν οὖν γλῶσσα θεωρεῖται περιφερὴς τῷ σχήματι, ἀπὸ πλάτους εἰς στενὸν καταλήγουσα, ἐῤῥιζωμένη ἀπὸ φαρυγέθρου, σαρκώδης τὴν σύγκρισιν καὶ ποσῶς νευρώδης, κινουμένη εἴς τε μάσησιν τῶν σιτίων, καὶ τὴν τῆς καταπόσεως ἐνέργειαν, ἔτι εἴς τε μάσησιν τῶν σιτίων, καὶ τὴν τῆς καταπόσεως ἐνέργειαν, ἔτι τε τὴν τῆς ἐνάρθρου φωνῆς γένεσιν, τὸν ἐκπεμπόμενον ἀέρα σχηματίζουσα κατὰ τὴν τῆς ψυχῆς ἐπίστασιν, αἰσθήσεως μετέχουσα τῆς γευστικῆς.

[20] Κατὰ δὲ τὴν βάσιν ταύτης ἐκπεφυκυῖα τυγχάνει ἡ ἐπιγλωσσὶς, οἱονεὶ γλῶσσα μικρὰ ἐπάνω τοῦ πλάτους ἐνεστῶσα κατὰ τὴν φάρυγγα, ἐκ βάσεως πλατυτέρας εἰς στενὸν ἀπολήγουσα, χονδρώδης τὴν σύγκρισιν, κατὰ τὴν πρὸς τὸν φάρυγγα συγγένειαν, ἣ τῆς μὲν τραχείας ἀρτηρίας πῶμα γίγνεται, τῆς δὲ εἰς τὸν στόμαχον παραπομπῆς ὁδός. [21] Ἐπὶ δὲ τῆς ἐπιγλωσσίδος ἄνωθεν ἐκκρεμὴς ἐπίκειται ἡ κιονὶς, ἀπὸ τῶν κατὰ τὸν οὐρανὸν μερῶν ἐκπεφυκυῖα κατὰ τὰ τῆς ὑπερῴας τρήματα, ἣ καὶ σταφυλὴ καλεῖται, ἀπὸ τῆς κατὰ τὸ ἄκρον ἐμφερείας, οὐ σπουδαίαν τινὰ παρεχομένη χρείαν· διὸ οὐδὲν ἐμποδίζονται οἱ ταύτην ἀποτμηθέντες.

[22] Ἐνδοτέρω δὲ τῆς γλώττης ἐξ ἑκατέρου μέρους κεῖται προστυπῆ [τὰ] παρίσθμια, ἓξ τὸν ἀριθμὸν ὄντα, ἀδενώδη τὴν σύγκρισιν, καὶ ποσῶς περιφερῆ, εὔτρεπτα, εὐαπόλυτα, ὑμενίοις προσειλημμένα προσαρτέσι κατὰ βάθος, ὧν τὰ μὲν τέσσαρα ἐξ ἑκατέρου μέρους θεωρεῖται· τὰ δὲ δύο ἐστὶν ἀφανέστερα. [23] Παρίσθμια δὲ λέγεται ἀπὸ τοῦ ἐν στενῷ πόρῳ κεῖσθαι· οἱ γὰρ ἀρχαῖοι τὰ στενὰ ἰσθμοὺς ἐκάλουν· καλοῦνται δὲ καὶ ἀντιάδες ἀπὸ

τοῦ κατὰ τὴν διάνοιξιν τοῦ στόματος ἀλλήλαις ἐναντίας φαίνεσθαι, καὶ μάλιστα ὅταν φλεγμαίνωσιν.

[24] Ἐντεῦθεν δὲ ἀπὸ τῶν κατὰ τὸν οὐρανὸν μερῶν καὶ τῆς γλώσσης ἐκφύονται δύο εἰς βάθος πόροι· ὧν ὁ μὲν ἔμπροσθεν καλεῖται φάρυγξ· μεταξὺ δὲ τούτου καὶ τῶν τοῦ τραχήλου σφονδύλων, στόμαχος. [25] Καὶ ὁ μὲν φάρυγξ χονδρώδης τυγχάνει, καὶ ἀναπετὴς κατὰ τὴν περιφέρειαν, ἐκ μὲν τῶν ἄνω πλατύτερος ὑπάρχων, ἐκ δὲ τῶν κάτω στενότερος· προϊὼν δὲ κατὰ τὰς κλεῖς καὶ τὸ ἀντίστερνον, τοῦ πλεύμονος ἐκφύεται μέσος, καὶ καταπλέκει τοῦτον τοῖς καλουμένοις βρογχίοις. [26] Τραχεῖα δὲ ἀρτηρία κέκληται οὗτος ἀπὸ τοῦ τετραχύνθαι· βρόγχος δὲ ὑπὸ ἐνίων εἰς πάροδον γεγονὼς ἀπὸ τοῦ τετραχύνθαι·

[27] βρόγχος δὲ ὑπὸ ἐνίων εἰς πάροδον γεγονὼς τοῦ κατὰ ἀναπνοὴν ἑλκομένου πνεύματος καὶ φωνῆς γένεσιν. Ἐξήρτηται δὲ ἀπὸ αὐτοῦ ὁ πλεύμων σομφός τε καὶ ἀραιὸς, περιεχόμενος τῷ κύτει τοῦ θώρακος, σφαιροειδὴς, καὶ μύουρος τὸ σχῆμα, διαιρούμενος εἰς λοβοὺς πέντε, τὴν χροιὰν τεφρὸς καὶ ὑπόλευκος, ἀεικίνητος, χώνης τρόπον ἐπέχων εἰς δίοδον τοῦ πνεύματος· τὸ γὰρ διὰ φάρυγγος ἀγόμενον εἰς τὰ βρογχία διὰ τῶν ἀραιωμάτων αὐτοῦ εἰς τὰ κενὰ τοῦ θώρακος δίεισι, καὶ πάλιν εἰς τὰ ἐκτὸς ἀπὸ τούτου διαπέμπεται τοῖς κατὰ φύσιν πόροις.

[28] Ἑκατέρωθέν τε προϋπέσταλται τοῖς ὑποχονδρίοις ὅ τε σπλὴν καὶ τὸ ἦπαρ, ἃ κεῖται ὑπὸ τὸν πλεύμονα· ἀλλὰ τὸ μὲν ἦπαρ εἰς τὸ δεξιὸν μέρος μᾶλλον προσηρτημένον τῷ διαφράγματι, ἐκ τῶν ὄπισθεν μερῶν ὠγκωμένον, ἐντομαῖς λοβῶν τεσσάρων ἢ πέντε

διασεσημασμένον, φακῶδες τὴν χροιὰν, ἐπὶ τὸ ἐνερευθέστερον· φλεβωδέστερον δὲ τὴν σύγκρισιν, καθὸ καὶ αἱματῶδες τῇ συστάσει. [29] Τῶν φλεβῶν δὲ τὰ τὴν κοίλην φλέβα τῇ διὰ τοῦ διαφράγματος ἐπὶ τὴν καρδίαν συνάπτοντα στόματα ὑπὸ τῶν ἀρχαίων εἴρηται καὶ πύλαι.

[30] Ὑπὸ δὲ τὸ κεκυρτωμένον μέρος ἔχει προσπεφυκὸς ἀγγείδιον κύστει παραπλήσιον, νευρῶδες, χολῆς περιεκτικὸν τοπικῶς ἐν αὐτῇ γενομένης· ἀπὸ οὗ δὴ καὶ πόρος νευρώδης τείνει διὰ τοῦ μεσεντερίου ἐπὶ τὰ ἔντερα, διὰ οὗ κατὰ βραχὺ διηθεῖται ἡ χολὴ εἰς τὰ ἔντερα, καὶ ἐπιχρώννυσι τὸ κόπριον, καὶ πρὸς τὴν ἀπόκρισιν αὐτοῦ προθυμίαν παρέχεται· οὗ διαφραγέντος καὶ τὸν ἴκτερον συμβαίνει γίγνεσθαι, τῆς χολῆς ἀναχεομένης εἰς τὸν ὄγκον· διὸ λευκὰ καὶ ἀργιλώδη τὰ διαχωρήματα φέρεται.

[31] Ὁ δὲ σπλὴν ἐναντίως τέτακται τούτῳ, παρεκτεινόμενος ἐπὶ μῆκος, ἀνθρωπίνῳ ἴχνει [ἐμφερής]· ἐκ μὲν τῶν ἄνω περιφερὴς καὶ ἐῤῥωμένος, ἐκ δὲ τῶν κάτω συναγόμενος καὶ ἰσχνὸς, τοῖς μέσοις δὲ στενούμενος, τρυγώδης τὴν χροιὰν, χαῦνος τὴν σύγκρισιν καὶ ἀραιὸς, ἀγγείων ἔχων καταπλοκὴν, ἄπρακτος καὶ ἀνενέργητος.

[32] Προσείληπται δὲ τοῖς λοβοῖς τοῦ πλεύμονος ἡ καρδία, κειμένη ἐν τῷ θώρακι, καὶ κατὰ τὴν μεσότητα, μᾶλλον εἰς τὰ ἀριστερὰ νεύουσα, καὶ κατὰ τὸν εὐώνυμον μαστὸν τεταγμένη, τῷ σχήματι στροβιλοειδὴς, καὶ ἀπὸ πλατείας βάσεως εἰς κορυφὴν συννεύουσα κωνοειδῶς, τὴν δὲ σύγκρισιν μυώδης τε καὶ νευρώδης, παλλομένη συνεχῶς σφυγμικῷ κινήματι, μεσόκοιλος, ἔχουσα κοιλίας δύο αἰσθητὰς ἐν αὐτῇ· τὴν μὲν ἐν δεξιοῖς λεγομένην αἱματικὴν, διὰ τὸ πλείονος αἵματος εἶναι περιεκτικὴν, τὴν δὲ ἐν τοῖς

εὐωνύμοις, καλουμένην πνευματικὴν, διὰ τὸ πνεῦμα πλέον ἐμπεριέχειν, ἢ καὶ κινεῖται κατὰ παράθεσιν τοῦ πνεύματος, ὑμέσι παρὰ ἑκάτερα πλατέσι κεχρημένη ὠτοειδέσι, διὰ τὸ περὶ αὐτὴν ὠτοειδῶς ἐσχηματίσθαι. [33] Ἐκφύεται δὲ ἀπὸ αὐτῆς ἀγγεῖα πλείονα, φλέβες τε καὶ ἀρτηρίαι, ἀπὸ ὧν τὸ ὅλον καταγ γειοῦται σῶμα. [34] Περίκειται δὲ τῇ καρδίᾳ ὑμὴν λεγόμενος περικάρδιος, νευρώδης τυγχάνων καὶ λεπτὸς, κινήσει κεχρημένος τῇ ἀπὸ καρδίας εἰς αὐτὸν διαδιδομένη.

[35] Ὁ δὲ τούτων ἁπάντων περιεκτικὸς θώραξ σύγκειται μὲν ἐκ χόνδρων καὶ ὀστῶν τῶν κατὰ τὰς πλευρὰς καὶ τὸ ἀντίστερνον· μετείληφε δὲ καὶ νεύρων καὶ σαρκῶν·καὶ ἔξωθεν μέν ἐστι σαρκωδέστερος, ἔσωθεν δὲ νευρώδης, κατὰ ἃ πρόσκειται τῷ ὑπεζωκότι. [36] Τὸ δὲ διάφραγμα διάκειται παρατεταμένον τῷ θώρακι λοξὸν κατὰ τὰ ἀπολήγοντα τῶν πλευρῶν. [37] Ὠνόμασται δὲ διάφραγμα ἀπὸ τοῦ διαφράσσειν τὰ ἐν τῷ θώρακι κείμενα σπλάγχνα.

[38] Ἐκ μὲν οὖν τῶν ἄνω μερῶν, ὡς ἔφαμεν, συνεκφύεται τῇ τραχείᾳ ἀρτηρίᾳ παράλληλον θέσιν ἔχων ὁ στόμαχος, ἀρχόμενος μὲν ἀπὸ τῶν αὐτῶν τόπων, οὐχ ὁμοίως δὲ τερματιζόμενος τῷ φάρυγγι· σαλπιγγοειδὴς δὲ κατὰ τὴν εὐρύτητα, ἄνω μὲν στενότερος ὑπάρχων, κάτω δὲ πλατύτερος, κατὰ ἃ συνάπτει τῇ κοιλίᾳ· [39] τὴν σύγκρισιν νευρώδης τυγχάνων. Ἔργου δὲ ἡγεῖται τοῦ τῆς καταπόσεως τῆς τροφῆς ξηρᾶς τε καὶ ὑγρᾶς· τούτων δὲ τὴν ἐπιζήτησιν διὰ ἑαυτοῦ ποιεῖται τυγχάνων αἰσθητικώτατος. [40] Ἡ δὲ γαστὴρ ἀποφυομένη τούτου, κεῖται μὲν κατὰ τὴν μεσότητα τοῦ διαφράγματος, εἰς τὰ εὐώνυμα δὲ μᾶλλον νενευκυῖα, ἀπὸ στενοῦ τοῦ φράγματος, εἰς τὰ εὐώνυμα δὲ μᾶλλον νενευκυῖα, ἀπὸ στενοῦ τοῦ στομάχου εἰς πλάτος κοιλαινομένη· καὶ τὸ μὲν

περίκυρτον αὐτῆς ἔξω πρὸς τὸ ἐπιγάστριον· τὸ δὲ ἔνσιμον πρὸς τὴν ῥάχιν· νευρωδεστέρα δὲ μᾶλλον τοῦ στομάχου, καὶ πλατυτέρα, τετραχυσμένη τὰ ἔνδον οὐχὶ λίαν, διεσταλμένη καὶ συμπίπτουσα τῇ τῆς τροφῆς εἰσόδῳ τε καὶ ὑποχωρήσει, πρὸς ὑποδοχὴν σιτίων γεγονυῖα.

[41] Ἀπὸ δὲ ταύτης ἐκφύεται τὰ ἔντερα ἑλικηδὸν εἰλημένα πρὸς παραδοχὴν τῶν [ἐκ] τῆς κοιλίας ὑποβιβαζομένων σιτίων, ὧν εἷς μὲν πόρος ἀπὸ τῆς ἐκφύσεως αὐτῆς ἄχρι τοῦ ἀπευθυσμένου καὶ τῆς ἕδρας διήκει. [42] Ἡγεῖται δὲ τούτων ὁ πυλωρὸς λεγόμενος ἢ δωδεκαδάκτυλος· πυλωρὸς μὲν, ἀπὸ τοῦ παρακρατεῖν τὰ ἐν τῇ γαστρὶ παρακείμενα, ὅταν ᾖ συνηγμένος· ὅταν δὲ ἀνεθῇ, τότε προστέλλεται κατὰ τῶν ἐντέρων παραπλησίως σφιγκτῆρι· δωδεκαδάκτυλος δὲ λέγεται ἀπὸ τοῦ μεγέθους, τοσούτων τυγχάνων δακτύλων· νευρώδης καὶ παχύς.

[43] Τούτῳ συνάπτει ἡ λεγομένη νῆστις σαρκωδεστέρα παρὰ τὰ ἄλλα ἔντερα σπανίζουσα τροφῆς κατὰ τὸ πλεῖστον· διὸ καὶ νῆστις προσαγορεύεται. [44] Ἐξῆς δὲ κεῖται τὰ λεπτὰ καλούμενα ἔντερα ἐπιμήκη πολυείλητα τρεῖς καὶ δέκα που πήχεων τὸ μῆκος· κεῖται δὲ ὑπὸ τὸν ὀμφαλὸν ταῦτα κατὰ τοῦ ὑπογαστρίου.

[45] Ἐπὶ πᾶσι δὲ τούτοις, τό τε τυφλὸν καλούμενον ἔντερον, καὶ τὸ κόλον ἐκπέφυκε κατὰ τὸ αὐτό, καὶ τὸ μὲν τυφλὸν, ἐπὶ εὐθείας ἐπὶ τὸν βουβῶνα τὸν δεξιὸν νεῦον, τῷ πέρατι ἀποκεκλεισμένον· [46] τὸ δὲ κόλον ἐκφυὲν κατὰ τὴν δεξιὰν λαγόνα ἄνωθεν ἐπιπίπτει κατὰ περιαγωγὴν ὡς ἐπὶ ἧπαρ καὶ ὑποχόνδριον πιοειδῶς ἀγόμενον· ἐνεχθὲν δὲ ὡς ἐπὶ σπλῆνα καὶ εὐώνυμον λαγόνα συνάπτει ὄπισθεν τῷ ἀπευθυσμένῳ. Τοῦτο δέ τινες καὶ τὴν

κάτω κοιλίαν ἐνόμισαν. Ἐν τούτῳ καὶ ἡ τροφὴ τὸ πλεῖστον εἰς κόπριον μεταβάλλεται. [48] Τὸ δὲ ἀπευθυσμένον, μετὰ ταῦτα ὑπάρχει σαρκωδέστερον ἐπὶ εὐθείας τεταμένον, κατὰ ὃ καὶ οὕτως ὠνόμασται. [49] Καταλήγει δὲ εἰς τὸν δακτύλιον καὶ σφιγκτῆρα, τὸν μὲν νευρώδη καὶ σκληρὸν, τὸν δὲ σαρκώδη καὶ ῥυσὸν, ἐπὶ πᾶσι τεταγμένον. [50] Μέσα δὲ τῶν ἐντέρων τέτακται τὸ καλούμενον μεσέντερον· τὸ δὲ αὐτὸ, καὶ μεσάραιον καλεῖται.

[51] Οἱ δὲ νεφροὶ κεῖνται μὲν κατὰ τοὺς τῆς ῥάχεως τελευταίους σφονδύλους, ἀριθμῷ δύο, σχήματι περιφερεῖς, χροιᾷ φακώδεις, καὶ ποσῶς ὑπότεφροι, ὧν ὁ δεξιὸς ἀνωτέρω βραχὺ καὶ μείζων εὑρίσκεται, τῇ συγκρίσει πυκνοὶ καὶ ψαφαροὶ, καίριοι δὲ κατὰ τὰς τρώσεις, ὡς καὶ θάνατον ἀπεργάζεσθαι. [52] Κατὰ δὲ τὰ ἔνσιμα ὑμένας ἔχουσι κατατετρημένους ἠθμοειδῶς, ἀπὸ ὧν δύο πόροι κατὰ τὴν κορυφὴν τῆς κύστεως συνάπτουσι, διὰ ὧν τὸ οὖρον ἐκδίδοται εἰς τὴν κύστιν, καὶ οὕτως ἐκκρίνεται.

[53] Ἄνωθεν δὲ τοῖς ἐντέροις ἐπίκειται διεκτεταμένος ὁ ἐπίπλους, σῶμα πιμελῶδες καὶ ὑμενῶδες, διῃρημένος. [54] Κατεσκεύασται δὲ ὡς ἂν τοῖς ἐντέροις ἐπιπλέον εἴη μάλαγμα πρὸς τὴν ἀπὸ τοῦ περιέχοντος αὐτὰ σκληρίαν περιτοναίου. [55] Ἔστι δὲ ἀκίνδυνος ἔν τε ταῖς τομαῖς, καὶ ταῖς τρώσεσιν.

[56] Οἱ δὲ σπερματικοὶ πόροι παρὰ τοὺς νεφροὺς κατίασι τέσσαρες· δύο μὲν ἐπὶ εὐθείας τείνοντες, οὓς καὶ παραστάτας τινὲς ἀδενοειδεῖς ἐκάλεσαν· δύο δὲ κιρσοειδεῖς διὰ τὸ κιρσοῦ τρόπον περιστρέφεσθαι. [57] Ἐν τούτοις καὶ τὸ γόνιμον ἀποτελεῖται σπέρμα, χαλαζῶδες καὶ παχὺ, οὓς καὶ γονίμους φλέβας τινὲς ὠνόμασαν· ἐν δὲ τοῖς ἑτέροις ἄγονον

καὶ λεπτὸν ὃ συναποκρίνεται τούτῳ ὑπὲρ θρέψεως αὐτοῦ.[58] Πλὴν συζυγέντα ἐξ ἑκατέρου μέρους κατίασιν ἀπὸ τῆς ῥάχεως ἀνὰ δύο· καὶ τὰ μὲν ἄγονα συνεμφύεται τῷ τραχήλῳ τῆς κύστεως· τὰ δὲ κιρσοειδῆ διὰ τῶν βουβώνων εἰς τοὺς χιτῶνας τῶν διδύμων παρὰ ἑκάτερα· ὅθεν οἱ εὐνουχισθέντες σπερμαίνουσι μὲν, ἄγονον [δὲ] ἐκ τῶν ἀδενοειδῶν, τῆς ἐκ τῶν κιρσοειδῶν ἀποκρίσεως οὐ δυναμένης σώζεσθαι διὰ τὴν πήρωσιν τὴν περὶ τοὺς διδύμους.

[59] Ὄσχεος δὲ καλεῖται καὶ τὸ ὅλον χάλασμα, ἐν ᾧ οἱ δίδυμοι, ἰδίως δὲ τὸ ἔξωθεν σαρκῶδες. [60] Σύγκειται δὲ ἐκ χιτώνων δύο, τοῦ μὲν ἔξωθεν δαρτοῦ καὶ ῥυσοῦ, τοῦ δὲ ἔσωθεν ἐλυτροειδοῦς. [61] Ὁ μὲν οὖν ὄσχεος καὶ δαρτὸς κοινῶς ἑκατέρους συμπεριειληφότες συνάπτουσι πρὸς τὰ ὑπερκείμενα· ὁ δὲ ἐλυτροειδὴς ἑαυτῷ συνῆπται, καὶ σφαιρικῶς ἐν κύκλῳ περιείληφε τοὺς διδύμους, ἰδίᾳ κατὰ ἕνα συνέχων. [62] Αὐτοὶ δὲ οἱ δίδυμοι ἀθαρώδεις εἰσὶ τὴν σύγκρισιν, καὶ δίυγροι ποσῶς ὑμένι περιεχόμενοι νευρώδει προστυπεῖ.

[63] Τῆς δὲ γυναικὸς τὸ γεννητικὸν μόριον, ἐξαίρετόν ἐστι πρὸς τὴν τυπὴν τῶν ἀγγείων. [64] Ἡ δὲ καλουμένη μήτρα κεῖται μεταξὺ κύστεως καὶ ἀπευθυσμένου, τούτῳ μὲν ἐπικειμένη, τῇ δὲ κύστει ὑποκειμένη, τῷ σχήματι σικύᾳ ἰατρικῇ παραπλησία, ἔνθα καὶ αἱ συνουσίαι περαιοῦνται.

[65] Φλέβες μέν εἰσιν ἀγγεῖα περιεκτικὰ αἵματος, διὰ ὧν τὸ αἷμα εἰς πάντας τοὺς τοῦ σώματος τόπους παραπέμπεται· ἀρτηρίαι δέ εἰσιν ἀγγεῖα περιεκτικὰ αἵματος μὲν ποσῶς, πνεύματος δὲ πλέον πολὺ, ἐν οἷς ὁ σφυγμὸς γίγνεται· καὶ τὸ ἀπὸ καρδίας ἐκθλιβόμενον

πνεῦμα διὰ αὐτῶν εἰς ὅλον τὸν ὄγκον ἀναδίδοται. [66] Πιμελή ἐστι παρέκχυμα λευκὸν, λιπῶδες, ὃ καὶ στέαρ καλοῦσιν.

[67] Ἀδένες εἰσὶ συστροφαὶ ποσῶς πιμελώδεις, καὶ σαρκώδεις ἰδίως κατακεχωρισμέναι εἰς τοὺς κοίλους τόπους, μασχάλας λέγω καὶ βουβῶνας, ἔτι δὲ καὶ μεσεντέριον. [68] Ὀστᾶ ἐστι συγκρίσεις στερεαὶ καὶ ἄναιμοι καὶ ἀναίσθητοι, διὰ ὧν αἵ τε πρακτικαὶ καὶ αἱ ἐρειστικαὶ κινήσεις συντελοῦνται.

[69] Μῦς ἐστι σῶμα ναστὸν καὶ πεπυκνωμένον, οὐχάπλοῦν, ἀλλὰ μετέχον καὶ νεύρων, καὶ φλεβῶν, καὶ ἀρτηριῶν, οὐκ ἄμοιρον αἰσθήσεως, ἐνέργειαν ἔχον προαιρετικῆς κινήσεως. [70] Χόνδροι δέ εἰσι συγκρίσεις μεταξὺ ὀστῶν καὶ νεύρων· ὀστῶν μὲν γάρ εἰσιν ἀπαλώτεροι· νεύρων δὲ σκληρότεροι, μάλιστα τοῖς ἀπολήγουσι τῶν ὀστῶν συμφυεῖς τυγχάνοντες.

[71] Νεῦρόν ἐστιν ἁπλοῦν σῶμα καὶ πεπυκνωμένον, προαιρετικῆς κινήσεως αἴτιον, δυσαίσθητον κατὰ τὴν διαίρεσιν. [72] Κατὰ μὲν οὖν τὸν Ἐρασίστρατον καὶ Ἡρόφιλον, αἰσθητικὰ νεῦρα ἔστιν· κατὰ δὲ Ἀσκληπιάδην οὐδὲ ὅλως. [73] Κατὰ μὲν οὖν τὸν Ἐρασίστρατον δισσῶν ὄντων τῶν νεύρων αἰσθητικῶν καὶ κινητικῶν, τῶν μὲν αἰσθητικῶν ἃ κεκοίλανται ἀρχὰς εὔροις ἂν ἐν μήνιγξι, τῶν δὲ κινητικῶν ἐν ἐγκεφάλῳ καὶ παρεγκεφαλίδι. [74] Κατὰ δὲ τὸν Ἡρόφιλον ἃ μέν ἐστι προαιρετικὰ, ἃ καὶ ἔχει τὴν ἔκφυσιν ἀπὸ τοῦ ἐγκεφάλου καὶ νωτιαίου μυελοῦ, καὶ ἃ μὲν ἀπὸ ὀστοῦ εἰς ὀστοῦν ἐμφύεται, ἃ δὲ ἀπὸ μυὸς εἰς μῦν, ἃ καὶ συνδεῖ τὰ ἄρθρα. [75] Μυελός ἐστιν οὐσία λιπώδης καὶ ἄναιμος, διαπαντὸς ὑπὸ ὀστῶν περιεχόμενος.

Translation of Rufus' *On the Anatomy of the Parts of the Body*

[1] After having discussed the terminology of the parts that are visible on the exterior, we shall now change course and investigate the interior parts. To philosophers, man seems to be a small world (microcosm); he is a well-ordered imitation of the heavens, exhibiting a complex workmanship both in the construction of his parts and in the achievement of their functions. Therefore, it is necessary to learn the study of anatomy, just as much as the other branches of medicine. [2] In establishing the principles of craft as the framework of our instruction, we shall explain the dispositions and names that nature assigns to each of the parts of the body.

[3] In the head, the brain -- along with the membranes surrounding it -- are encapsulated beneath the walls of the skull. The human brain appears larger, with respect to the rest of the body, than that of animals. It is a fleshy, clingy, and exceptionally white compound, and the part situated near the nape of the neck is called the cerebellum. [4] Of the meninges, one adheres to the bone of the head (dura mater) and moves with a pulse. The other meninx (pia mater) surrounding the brain prevents its destruction and preserves its composition. [5] The meninges are nerve-filled and membranous; they have a certain amount of sensation and possess a network of vessels. [6] The innermost membrane lacks movement, while the most external and thickest membrane moves freely. [7] From the brain, there descends an outgrowth of marrow which travels through the bottom orifice of the skull near the nape of the neck. Furnished with channels, it travels through the spine, down to its base. It is not a fixed sort of assemblage, but rather a discharge from the brain; it is called spinal marrow. [8] Channels of nerves descend from the brain to each of

the sensory parts, like the ears, nose, and others. [9] One of these channels is set in front of the base of the brain and is divided into two branches. It bends first towards each of the eyes in a region called the “basin” or “ditch-like hollow” of the face, and then towards each side of the nose. [10] There the interweaving of membranes forms the framework of the eye. The membrane which is located in front of all the others is called “first” in accordance with its position; “white” because of its color; or simply the “first, white membrane.” It is also called “horn-like,” both because of its durability and because the liquid within it shines like ivory. [11] But also, like horn, it is composed of fibrous layers. The second membrane adheres to the first as far as the attachment called the “crown.” There, to protect the central part from separation, it is perforated and round. [12] The perforated part, which leans upon the cornea, is smooth on the outside but rough on the inside, as Herophilus says. It is formed from interlaced vessels and resembles the skin of a cluster of grapes. [13] This membrane is called “second” because of its position; “perforated” because of its structure; “grape-like” because of its appearance; and “choroid” because it is like the chorion (the extra-embryonic membrane). [14] The third membrane (retina) emerging from this canal surrounds a liquid similar to the white of an egg and is called “crystalline” (vitreus). [15] This membrane is quite thin and is called “crystalline” because the liquid contained within it; “arachnoid” because of its fineness; and “net-like” both because of the interlacing of its vessels and because of its shape. It widens from a narrow to an open position and also hollows out in order to receive the fourth membrane. This membrane contains a liquid similar to crystal. One half of it leans forward, joining with the opening of the second membrane (papillary membrane), and the other half leans against the arachnoid membrane. [16] The fourth membrane is called

“disk-like” and “lenticular” because of its shape and “crystalline” because of the liquid contained within it. [17] Certain doctors consider it incorrect to label this fourth structure a membrane; they say, rather, that it is a certain membranous cluster.

[18] One must turn now to the parts lying within the mouth. [19] The tongue appears round in shape, having tapered from a wide base to a narrow point. It is rooted at the pharynx and is a combination of fleshy and nervous material. It moves during the chewing of food, during the process of swallowing, and in the articulation of sound. It shapes the breath that is released from the mouth, according to the halting movements of the soul. It also participates in the sensation of taste.

[20] At the base of the tongue, the epiglottis emerges; it is like a small tongue, standing with all its width atop the pharynx. It is wide at its base and narrow at its endpoint and has a cartilaginous structure where it shares space with the pharynx. It functions as a lid for the arterial-trachea and is the path and director to the stomach. [21] The uvula hangs suspended below the epiglottis, emerging with its neighboring parts at the roof of the mouth, near the openings of the palate. It is called a “bunch of grapes” because of the resemblance of its tip to a grape. It has no serious purpose, and when it is severed, no function is hindered.

[22] At the most remote part of the tongue, are lateral glands, located on either side of the tongue. They are six in number, have a glandular structure, are fairly round, easily changed, easily uprooted, and are attached to mucosal membranes suspended at the base

of the tongue. [23] Four are visible at either side, and two are invisible. They are called "isthmuses" because of their placement on a narrow channel. The ancients call these narrow passages "isthmuses." They are also called "opposing glands" because they appear opposed to one another when the mouth is opened and, most of all, when they are inflamed.

[24] From there, at the base of the tongue and the roof of the mouth are two channels that extend downwards. One is located in front and is called the pharynx; the esophagus is located between the pharynx and the vertebrae of the neck. [25] The pharynx is cartilaginous and opens in a circular fashion; it is wider at the top and narrower at the base. It descends down to the clavicles and "anti-sternum," extends to the middle of the lungs, and entwines the part called the bronchiae. [26] It is also called the "arterial trachea" because of its roughness, though some call it a "bronchus" when it functions as a passage for the drawing of breath and the production of sound.

[27] The lungs are suspended from the bronchus; they are porous and permeable and are surrounded by the hollow of the chest. They are round, though their endpoint takes the shape of a mouse-tail. They are divided into five lobes, have an ashen or whitish color, are always in motion, and act as funnels for directing the passage of air. The air going through the pharynx and to the narrow portions of the bronchiae enters the cavity of the chest, where, in accordance with nature, it is recaptured and sent out through the channels.

[28] On each side of the torso, under the cartilage of the chest, are the spleen and the liver, the latter of which lies under the lung. The liver is on the right-hand side and is attached to the diaphragm, extending from its posterior sections. It is divided into four or five lobes. [29] Its color is that of lentils, or it might even be somewhat ruddy. It has a venous structure, and its composition is blood-red. The orifices of the veins which connect the hollow vein (vena cava) to the heart are called “gates” by the ancients.

[30] Under its curved section, the gallbladder has a part that is nervous and resembles the bladder; it is filled with bile that is produced locally within it. From here, a channel, which is also nervous, stretches from the mesentery to the intestines and gradually transports bile to the intestines. Bile lends color to fecal matter and prompts its removal from the intestine. But if its path is blocked, jaundice develops, and bile pours scatters in the body. In this event, excrement appears white and clay-like.

[31] The spleen is located opposite the bladder; it is stretched-out and long, resembling the footprint of a man. On its upper portion, it is round and sturdy; on its lower portion, tight and thin; and on its middle portions, narrow as well. Its color is that of wine. Its structure is loose and porous, since it is a network of vessels. It is idle and serves no purpose.

[32] The heart is surrounded by the lobes of the lungs and is located in the thorax, along the midline. But it is located more to the left than the right and is situated under the left breast. It takes the form of a cone -- wide at its base and stretching conically at its

endpoint. Its structure is muscular and nervous. It is stirred constantly with a pulsing motion. Hollow in the middle, it has two distinct cavities in it. The one on the right is called “sanguine” because it is filled, more than anything else, with blood. The one on the left is called “pneumatic” because it is filled with *pneuma*; it is moved with the stored *pneuma*. On each side, the heart is equipped with large, ear-like membranes -- so-called since they are placed around like ears on the face. [33] Many vessels emerge from the heart, veins and arteries, which spread from the heart to the whole body. [34] A nervous and thin membrane called the pericardium surrounds the heart; it moves with an impulse given to it by the heart.

[35] The thorax contains all of these parts; it is made up of cartilage and bone and constitutes the sides and anti-sternum. It also contains nerves and flesh. On the outside, it is fleshy, and on the inside, it is nervous, where it is covered by an enveloping membrane. [36] The diaphragm covers the thorax along the sides, along the ends of the flank. [37] It is called the “diaphragm” because it separates the viscera contained within the thorax from those outside.

[38] From these upper parts, as we have discussed, the esophagus emerges from the same area as the arterial-trachea and descends in parallel with it. But at its lowest point, it is not like the trachea. It is trumpet-like in its breadth – narrow at the top and wider at the bottom, where it touches the stomach. [39] Its structure is nervous. Its task is the movement of solid and liquid food. [40] And since it is sensitive, it creates a demand for these things. The stomach, which emerges from the esophagus, lies along the midpoint of

the diaphragm, though it leans more to the left, and widens from the narrow opening of the esophagus. The convex part of it extends outward towards the stomach, while the concave part heads towards the ribs. It is more nervous and wider than the esophagus. It is rough on the inside -- but not that rough. It moves with the arrival of food within it; this is done for the acceptance of nourishment.

[41] From this organ, emerge the entrails which wind in a spiral to receive food sent down from the stomach. And from the entrails, there is a single path from their point of origin to the rectum and anus. [42] The pylorus, which is also called the duodenum, opens into this passage. It is called the pylorus (gate keeper) because it holds back the contents of the stomach when it is contracted. But when it is relaxed, it sends the contents into the intestines, like a sphincter. The duodenum (having twelve digits) is so-called because its breadth stretches the length of twelve fingers; it is nervous and thick.

[43] The jejunum follows the duodenum; it is the fleshiest part of all the intestines and is nearly always empty of food. It is for this reason that it is called “empty.” [44] After this, we encounter the long, thin intestines, which are folded over themselves many times and have a length of thirteen cubits; they extend from the navel to the lower stomach.

[45] After all these parts, the intestines called the caecum and colon emerge from the same area. The caecum extends in a straight line down the right flank and is closed at its endpoint. The colon also emerges from the right flank and climbs towards the upper colon. It circles around the liver and hypochondryles in the shape of the letter pi; then it

extends down the rear of the left flank with the rectum. [46] Some doctors consider the colon to be a lower stomach. [47] It is in the colon that most food is changed into feces. [48] The rectum follows the colon. It is the fleshiest part of the intestines and descends in a straight line; this is the cause of its name. [49] It ends at the anus and sphincter – one is nervous and hard; the other is fleshy and corrugated and marks the endpoint of the intestines. [50] In the middle of the intestines, the mesentery is arranged. It is also called the *mesaraion*.

[51] The kidneys lie near the last vertebrae of the spine. They are two in number. They have a round shape and are the color of lentils, though they border on an ashen color; and the right one is a little lower and larger than the left. In structure, they are dense and lobular. They are a vital part of the body, and if they are wounded, death can result. [52] On their concave side, they have membranes which are perforated like a sieve. From here, two channels (ureters) attach to the top of the vessels. It is through these that urine is sent to the bladder and is pushed out.

[53] On the top of the upper stretch of the intestines is the greater omentum, a fleshy, membranous, and divided body. [54] It is situated in such a way that it floats atop the intestines and is kept soft, despite the roughness of the peritoneum surrounding it. [55] And it is of no danger to the organ if it is cut or wounded.

[56] Four spermatic vessels descend near the kidneys. Two of these extend in a straight line and are called glandular *parastates*. The others are called varicose channels because

they unroll like varicose veins. [57] In these channels, which some doctors call "generative veins," a fertile seed is formed; it is lumpy and thick. In the others, the seed is sterile and thin, but descends with the fertile seed for the sake of nourishment. [58] The rest of the vessels, yoked together, descend from the spine two at a time. The infertile vessels attach to the neck of the bladder, while the varicose vessels travel through the groin and attach to either side of the testicular membranes. Eunuchs do produce sperm, but their sperm is sterile and comes from the glands. The power of the semen from the varicose channels is not preserved if the testicles are removed.

[59] One calls "scrotum" the entire slackened area, particularly the fleshy outer part, which contain the testicles. [60] The scrotum is composed of two membranes: the outer one appears scratched and rough, while the inner one is in the form of a spear case. [61] The scrotum and outer membrane, wrapping around themselves, attach to the testicles. The inner membrane folds over itself and surrounds each testicle in a circle. [62] The testicles have a porridge-like consistency and are somewhat watery but are contained by a nervous membrane.

[63] The female generative organ is a wondrous vessel. It is called the "mother" and is situated between the bladder, which lies on top of it, and the rectum, on top of which it lies. [64] It resembles a cupping instrument used by doctors, and it is there that reproduction is achieved.

[65] Veins are the vessels which contain blood and which send that blood to all the parts of the body. Arteries are vessels which contain some blood and more *pneuma*. The pulse is generated in arteries. And *pneuma* is squeezed from the heart and spreads across the arteries to the entire body. [66] Fat is a white, oily mass, which is also called lard.

[67] I call "glands" the somewhat fatty and fleshy compounds, located primarily in hollow areas like the armpits, groin, and mesentery. [68] Bones are hard, bloodless, and insensible compounds; it is through them that activity and pushing movements are accomplished.

[69] Muscle is a solid and dense body. It is not simple; rather, it is a mixture of nerves, veins, and arteries. It is not devoid of sensation and is the locus of voluntary motion. [70] Cartilage is a compound between bones and nerves; it is softer than bones and harder than nerves, especially cartilage which is attached to the ends of bones.

[71] A nerve is a simple and dense body. [72] It is the source of voluntary motion but has no sensation if it is cut. According to Erasistratus and Herophilus, there are sensitive nerves, but according to Asclepiades, there are none. [73] Erasistratus says that there are two types of nerves -- sensory and motive. The sensory nerves are hollow and originate in the meninges, while the motor nerves originate in the brain and cerebellum. [74] According to Herophilus, there are nerves of voluntary motion which originate in the brain and spinal marrow. They attach either from bone to bone, from muscle to muscle,

or between joints (tendons). [75] Marrow is a fatty and bloodless substance and is present is all the bones.

Commentary on Rufus' *On the Anatomy of the Parts of the Body*

1. Particularly relevant to Rufus' scheme is the Hippocratic treatise *On Anatomy*, analyzed extensively by Craik in 1998. *On Anatomy* is the shortest treatise of the Hippocratic corpus and is, perhaps, an abridgment of a fuller account.[63] It traces the internal configuration of the human body, with a focus on the trunk. It is mostly descriptive and contains little on function. That text evidences a particularly schematic arrangement of the arrangement of the parts of the body. *Apo* appears six times, *es* four times, and *epi* once And beyond that, there is an emphasis on investigating from start to finish; top to bottom; and left to right. Also noteworthy is that the text describes two parallel paths: (1) trachea, lung, heart, kidney, bladder, genitals and (2) esophagus, belly, diaphragm, spleen, intestine, colon, rectum, anus.

1. Παραδόντες τὴν τῶν ἔξωθεν θεωρουμένων ὀνομασίαν: The implication seems to be that Rufus is continuing his *Names of the Parts of the Body.*

1. κατὰ τοὺς σοφοὺς: It is unusual that Rufus is using philosophers as his authority for why anatomy should be studied. Galen wouldn't put medicine down like this.

2. ἡ φύσις θέσιν τε καὶ ὀνομασίαν: There is a trace of etymological theory here. The thesis is that the human body – both as a whole and each part individually – is perfectly constructed, in terms of function. And any change would be for the negative. This idea derives from Aristotle's claim that "nature does nothing in vain. Indeed, Galen says that

[63] Craik (1998), 135.

"Aristotle is right when he says that all animals have been appropriately equipped with the best possible bodies, and he attempts to note the skill used in the making of each one."[64] It is Nature who decides the proper size, shape, and location of all the parts.

3. As a general comment, the brain-to-body mass ratio is a rough estimate of an animal's intelligence. Larger animals generally have larger brains, but elephants, despite their large size and intelligence, have relatively small brains, and rodents have the same ratio as humans. Indeed, shrews have the highest ratio of any known animal: its brain is 10% of its body weight, as opposed to 2% in humans. Aristotle *HA. 449b29* notes that the brain is largest in man.

12-15. Notice the cluster of metaphors here: (1) cluster of grapes: food metaphor; (2) white of an egg: food metaphor; (3) arachnoid: animal metaphor; (4) crystalline: mineral.

19. Pollux 2.4.207 differentiates between the pharynx (the start of the esophagus) and the larynx (the trachea).

21. As in Rufus, in *HA.*1.11.493a2-4, we find a similar description of the uvula. Compare Hipp. *Morb.*IV.29

21. οὐ σπουδαίαν τινὰ παρεχομένη χρείαν: Rufus seems to be contradicting his claim in the introduction about the functions of every part of the body.

[64] Galen.*Usu Partium.*I.22.

23. οἱ γὰρ ἀρχαῖοι τὰ στενὰ ἰσθμοὺς ἐκάλουν: Geographical metaphor.There is some needless repetition from one sentence to the next.

26. "Τραχεῖα ἀρτηρία" is used either for the trachea or windpipe in the Hippocratic corpus, but the use of "trachea" and "bronchial tubes" is inconsistent. That is, *bronchos* is used both for the bronchial tubes and the entire area between the throat and lungs. According to Rufus, it was Herophilus who gave the name "artery-like vein" (*phleps arteriodes*) to the pulmonary artery. The distinction between the pulmonary artery (*phleps arteriodes*) and pulmonary vein (*arteria phlebodes*) was held by both Erasistratus and Galen.

27. The singular πλεύμων is dominant in the Hippocratic corpus. Aristotle, too, considered the lung a single organ.[65] The lobes of the lung and the lobes of the liver are often conflated.

27. μύουρος τὸ σχῆμα: animal metaphor

27. There is disagreement in the various medical traditions whether the liver has five lobes, as Rufus here suggests, or four. In the Hippocratic *Oss.*1, it has five – two on the left (one superior and one inferior) and three on the right (one superior, one inferior, and one middle). But in *Oss* 1 and 18, it has fewer. This might be the result of confusion between the caudate and quadrate lobes.

[65] Arist.*HA*. 1.16.495b, *PA*.669b.

27. κατὰ φύσιν: It is not clear why is this in accordance with nature. Perhaps there is there some sort of nature abhors a vacuum principle at work.

28. Aristotle linked the spleen and liver; and both were located with reference to the diaphragm.[66]

29. On the color, mottling, and texture of the lungs, see also Arist.*GA.*1285.

30. Stools that are pale or clay-colored arise from problems in the biliary system, especially the gall bladder, liver, and pancreas. Bile is produced in the liver and stored in the gall bladder. Bile gives stool its brown color, so if there is no bile (or blocked bile), stool will be pale.

30. In 1983, Ullman edited and translated into German the Arabic version of Rufus' *On Jaundice*. Therapy includes purging, bloodletting, cupping, and cataplasm. The condition can affect the liver or spleen, though cupping is only an appropriate treatment for the liver. If blood is mixed with bile, blood-letting is the preferred treatment (16-17).

31. ἀνθρωπίνῳ ἴχνει: Again explaining human anatomy with human anatomy

31. τρυγώδης τὴν χροιὰν: food metaphor

[66] Arist. *HA.*496b15 where the spleen is viewed as a false liver, and in *PA.*669b28.

31. ἄπρακτος καὶ ἀνενέργητος: Again, like the uvula, here we have something that has no function in the body. But it does not seem to bother Rufus much.

32. τῷ σχήματι στροβιλοειδὴς, καὶ ἀπὸ πλατείαςβάσεως εἰς κορυφὴν συννεύουσα κωνοειδῶς: geometrical metaphor

32. Compare Arist. *GA.*697, where the heart is described as pouch-shaped. Diocles describes two auricles of the heart, and these suggest that the heart has cognitive powers, as they allow the heart to "hear." However, in the Hippocratic text *On the Heart* 8, the heart's "ears" do not have holes for listening but for gathering air.

38. The esophagus was seen as parallel to the trachea: air (and fluid) travelled through the trachea, while flood moved through the esophagus.

38. σαλπιγγοειδὴς: musical instrument

42. ὁ πυλωρὸς: we have an architectural metaphor, but here the organ itself has a function, rather than being a passive vessel for blood, pneuma, or other purposeful material.

42. δωδεκαδάκτυλος: human anatomy explaining human anatomy again

52. Erasistratus held that vital pneuma existed in the heart, while the seat of psychic pneuma was the brain.

55. Ἔστι δὲ ἀκίνδυνος ἔν τε ταῖς τομαῖς, καὶ ταῖς τρώσεσιν: It, thus, appears to have no function.

57. The author of the Hippocratic *On Anatomy* notes four pairs of thick veins: (1) One pair extends from behind the head, through the neck, and emerges on either side of the spine, where it stretches to the loins and eventually to the ankles and feet. (2) The second pair travels from the head, by the ears, through the neck and jugular, and then through the thigh to the insides of the feet. (3) The third pair goes through the temples to the shoulder blades and then to the lungs, right breast, spleen, kidneys, and left side of the liver. (4) The last pair extends from the front of the head and eyes to the upper arm, elbow, forearm, wrist, fingers, and genitals. Veins lead from these thick veins to the belly, which is especially blood-rich, and the rest of the body.

58. οἱ εὐνουχισθέντες: Here Rufus uses a verb form – "those who have been made eunuchs." This suggests that Rufus is referring not to *spadones,* or natural eunuchs but to those who have been sexually mulitated. Eunuchs in antiquity were created by crushing (*thladiae*), pressing (*thlibiae*), or surgically cutting (*castrati*) their testicles. See Stevenson (1995), 495. Yet becoming a eunuch was forbidden by law at various periods under the Empire. And it was illegal to castrate slaves.

63. τῷ σχήματι σικύᾳ ἰατρικῇ παραπλησία: This is a more obscure analogy than usual. Heat and space are used by Aristotle to describe how the uterus draws in semen like a conical flask: when inverted in warm liquid, it suctions it upward.[67] Asclepiades compares breathing to cupping glasses.

65 "Φλέβες" are described as carrying blood, while arteries carry mostly pneuma. Pollux 2.5 defines arteries as passages for air. Its derivation is unknown, yet "*airo"* means left, and the lungs are suspended by the trachea and the heart, by the aorta (*aorteo* means "to suspend").

68. Galen's *Anatomical Procedures*.2.220 explains that the form of the body corresponds to its bones, so it is of great importance to study bones.

72. κατὰ δὲ Ἀσκληπιάδην: Asclepiades is the latest author referenced; he died in the early first century BCE.

[67] Arist.*GA*.739b.

Greek Text of Rufus' *On the Names of the Bones of Man*

Ἐπειδὴ τὴν τῶν ἐντοσθίων θεωρίαν κατὰ τὸ ἐνδεχόμενον παραδεδώκαμεν, ἑξῆς περὶ τῆς ὀστεολογίας λεκτέον ἡμῖν. Τὸ κρανίον τοίνυν, κατὰ τὸ λεγόμενον σκαφίον, ἐστὶ σφαιροειδές·τοῖς μὲν κατὰ κορυφὴν μέρεσιν ὀγκῶδες, τοῖς δὲ περὶ τὸ βρέγμα τυγχάνουσιν ὑπόπαχυ ποσῶς καὶ πλατὺ, καὶ διπλοῦν κατὰ ἐπι βολὴν ὀστοῦ, τοῖς κροτάφοις συνεσταλμένον. Ἔχει δὲ κατὰ τὸ πλεῖστον ῥαφὰς πέντε, μίαν μὲν κατὰ κορυφὴν λαμβδοειδῆ εἰς τοὐπίσω τοῦ κρανίου φερομένην· ἑτέραν δὲ ἐπὶ τοῦ βρέγματος περιφερῆ, οἱονεὶ στεφανιαίαν· λήγει δὲ κατὰ αὐτό· τρίτη δὲ ἀπὸ τῆς λαμβδοειδοῦς ἐπὶ εὐθὺ τῇ στεφανιαίᾳ συνάπτει· ἄλλαι δὲ δύο παρὰ τὰ ὦτα, περὶ τοὺς τῶν κροτάφων τόπους, λεπιδοειδεῖς λεγόμεναι, οὐ κατὰ βάθος ἔχουσαι τὰς ἁρμογὰς, ὡς αἱ λοιπαί.

Ἐκ δὲ τῶν ἔμπροσθεν μερῶν εἰσιν [αἱ] κοιλότητες, ἔνθα οἱ ὀφθαλμοὶ ἐνίδρυν ται, πυελίδες προσαγορευόμεναι. Μεταξὺ δὲ τούτων ἡ τοῦ μυκτῆρος ὑπεροχὴ, ἐν ᾗ τὸ ἠθμοειδὲς ὀστοῦν ὑπόκειται, πλείσταις κεχρημένον κατατρήσεσιν. Ἔχει δὲ καὶ τὸ πρόσωπον ὀστῶν συνθέσεις ταύτας· μίαν μὲν ὑπὸ ταῖς ὀφρύσι, καὶ δύο ἄλλας ἐκ πλαγίων τοῦ τῆς ῥινὸς ὀστώδους· τετάρτην δὲ τὴν διείργουσαν τὴν ἄνω γένυν· εἶτα ἑξῆς τὴν κατὰ τῆς ὑπερῴας, καὶ [τὴν] κατὰ τῶν ζυγωμάτων, καὶ δύο ἄλλας δυσοράτους κατὰ τῶν μήλων. Τὸ δὲ κρανίον ἐκ τῶν ὑποκάτω μερῶν κοιλανθὲν ἔκτρησιν ἔχει διαμπερῆ καὶ περιφερῆ, διὰ ἧς ὁ νωτιαῖος μυελὸς καταφέρεται. Εἰσὶ δὲ οἱ τοῦ τραχήλου σπόνδυλοι ἀριθμῷ τυγχάνοντες ἑπτά· ἁρμονίως δὲ ἄλλος κατὰ ἄλλου ἔγκειται. Καὶ ὁ μὲν πρῶτος τούτων τὴν κίνησιν τῇ κεφαλῇ παρέχεται· οἱ δὲ λοιποὶ μένουσιν ἀκίνητοι. —Ἑξῆς παράκειται ὁ ὦμος καὶ [ἡ ὠμοπλάτη]· ἡ μὲν οὖν ὠμοπλάτη κατὰ σχῆμα τρίγωνος οὖσα,

δελτοειδῶς ἐπίκειται ταῖς σπάθαις τοῦ θώρακος, ἐκ τῶν ὄπισθεν μερῶν. Καὶ ἐκ μὲν τοῦ πλατυτέρου μέρους ἐστὶ λεπτοτάτη, ἐκ δὲ τοῦ συναγομένου παχυτέρα τε καὶ ἐῤῥωμένη, κοιλότητά τινα ἔχουσα, εἰς ἣν ἐνήρθρωται ἡ κεφαλὴ τοῦ βραχίονος· ἀπὸ ἧς κοιλότητος διεκτέταται ὑπεροχὴ, ὡσανεὶ ῥάχις, λεγομένη ἀγκυροειδὴς, ἢ ἀγκιστροειδὴς, ἐπὶ ἣν τὸ τῆς κλειδὸς πέρας πέπτωκε χόνδρῳ συμφυέν.

Ἡ δὲ κλεὶς τριβολοειδῶς ἐσχηματισμένη ἐμφέρειαν ἔχει καθετῆρι ἀῤῥενικῶ· συνήρθρωται δὲ τῷ στέρνῳ, καὶ συνεμπέφυκε τῇ ὠμοπλάτῃ. Αὐτὴ δὲ ἡ μεσότης τῶν κλειδῶν σιγματοειδὴς τυγχάνουσα, συμβάλλει τῷ πρώτῳ τῆς ῥάχεως σπονδύλῳ. —Ὁ δὲ βραχίων ἐπιμήκης ἐστὶ, καὶ περιφερής. Καὶ τὸ μὲν ἄνω μέρος ἔχει ὀγκωδέστερον, ὃ καλεῖται κεφαλὴ βραχίονος, ὅ περ κατὰ ἡμίτομον ἔγκειται τῇ τῆς ὠμοπλάτης κοιλότητι· ἐκ δὲ τῶν κάτω κατὰ ὃ συνήρθρωται τῷ ἀγκῶνι, ἐστὶν ἀνώμαλος, ὥστε ἐξοχὰς ἔχει παρὰ ἑκάτερα κονδυλοειδεῖς δύο, μέσην δὲ κοιλότητα. Ἐκ μὲν τῶν ἔμπροσθεν ἧττον ἀνέσταλται, μᾶλλον δὲ ἐκ τῶν ὄπισθεν.

Τοῦ δὲ πήχεος δύο ἐστὶν ὀστᾶ, πῆχυς, καὶ κερκίς. Καὶ τὸ μὲν τῆς κερκίδος πέρας τῶν κονδύλων τοῦ βραχίονος τὸν ἔξω ἐπικαλύπτει περιφερὲς γενόμενον, καὶ ποσῶς ὑπόκοιλον. Ὁ δὲ πῆχύς ἐστι μακρότερος, καὶ κατὰ τὴν κάμψιν τοῦ καρποῦ ὑποδέχεται πέρας. Ἡ δὲ κερκὶς κατὰ τὰ μέρη τοῦ καρποῦ κοιλότητας ἔχει δύο, μίαν μὲν εὐθεῖαν, ἐν ᾗ ἐνήρθρωται· ἑτέραν δὲ πλαγίαν, εἰς ἣν ὁ κόνδυλος τοῦ πή χεος ἐμφύεται. —Ὁ δὲ καρπὸς σύγκειται μὲν ἐξ ὀστῶν ὀκτὼ στροβιλοειδῶς. Ἐπὶ τούτων ὑπάρχουσιν αἱ φάλαγγες, ὀστᾶ ἐπιμήκη, δακτυλοειδῆ, ἐπὶ οἷς αἱ σκυταλίδες τῶν δακτύλων, ἑκάστου τρεῖς, ἄνισοι ἀλλήλαις, χωρὶς τοῦ ἀντίχειρος· οὗτος γὰρ ἐκ βάσεως δυσὶν ὀστοῖς κέχρηται.

Μετὰ δὲ τοὺς ἑπτὰ τοῦ τραχήλου σφονδύλους, οἱ τῆς ῥάχεώς εἰσι δυοκαίδεκα, καὶ τῆς ὀσφύος πέντε, ὡς γενέσθαι τοὺς πάντας τέσσαρας καὶ εἴκοσιν. Οὕτω δέ εἰσι κατεσκευασμένοι, ὡς τοῖς μὲν ἔνδοθεν μέρεσιν εἶναι λείους καὶ περιαγεῖς κατὰ ὃ σπλάγχνοις ὁμιλοῦσιν· ἐκ δὲ τῶν ὄπισθεν τετραχυσμένους καὶ ἀκανθώδεις κρυπτομένους σαρκὸς ἐπιφύσει· τὰ δὲ παρὰ ἑκάτερά ἐστι τραπεζώδη· πάντες μεσόκοιλοι, μίαν εὐρυχωρίαν ἔχοντες, σωληνοειδῶς σώζοντες κατὰ τὴν σύγκρισιν, διὰ ἧς ὁ νωτιαῖος μυελὸς καταφέρεται, ὡς προείπομεν, τυπώσεις ἔχοντες πλαγίας, ἐν αἷς ἐνηρμοσμέναι εἰσὶν αἱ σπάθαι. Τῶν οὖν σπαθῶν, αἱ μὲν ἀνωτέρω καμαροειδεῖς, συμβάλλουσιν ἀλλήλαις, αἱ δὲ λοξοειδεῖς ἀντιβαίνουσαι τούτων ἑξῆς, χονδρώδεις ἄκανθαι καὶ νόθοι πλευραὶ καλοῦνται· μείζους [μὲν?] τῶν ἄνω τὴν παρέκτασιν, ἐκ συμβάσεως [δὲ] ἐλαττούμεναι. Πάντων δὲ τῶν σπονδύλων ὁ τελευταῖος διενήνοχεν, ὃν καὶ ἱερὸν ὀστοῦν καλοῦμεν, συνήθως τῶν ἀρχαίων ἱερὰ τὰ μεγάλα καλούντων.

Ἑκατέρωθεν δὲ τοῦ σπονδύλου τούτου τὰ τῶν ἰσχίων ὀστᾶ παρατεθέντα ἐκ τῶν ὄπισθεν, ἃ καὶ συνάπτει τοῖς πέρασι, κατὰ τὸ ἐφήβαιον χόνδρῳ συμφυέντα. Ἐσχημάτισται δὲ τὰ τῶν ἰσχίων ὀστᾶ πλατέα εἶναι καὶ ποσῶς περι φερῆ· κατὰ δὲ τὰ ἕτερα στενὰ καὶ παχύτερα. Ἔχουσι δὲ κοιλότητας οὐ διαμπερεῖς, βαθείας [δὲ], αἳ κοτύλαι καλοῦνται εἰς ἃς αἱ κεφαλαὶ τῶν μηρῶν ἐναρμόζονται.

Οἱ δὲ μηροὶ ὀστᾶ ἐπιμήκη, ἐῤῥωμένα τε τυγχάνουσι, τὴν ἔκτασιν ἀπὸ τῶν ἰσχίων ἄχρι γόνατος ἔχοντα, περιφερῆ, πρόκυρτα. Ἐκ δὲ τῶν κατὰ τὸ γόνυ πάλιν ἑκάτερα αὐτῶν πάχος ἔχει καὶ περιφέρειαν κονδυλώδη, ὡς ἑκατέρωθεν μὲν ἐπῆρθαι, κεκοιλάνθαι δὲ ἐν

μέσῳ κατὰ ἃ προσκυρεῖ ἡ κνήμη τρίγωνος οὖσα, καὶ περὶ τὴν κεφαλὴν πεπλατυσμένη, κοιλότητας ἔχουσα ἐπιπολαίους, κατὰ ὧν αἱ κονδυλώδεις ὑπεροχαὶ ἐντίθενται. Αὐτῆς δὲ τῆς κνήμης ἡ ὑπεροχὴ εἰς τὴν τοῦ μηροῦ κοιλότητα ἀντικλείεται. Παράκειται δὲ ἐκ τῶν ἔξωθεν μερῶν ἡ περόνη ταύτης ἰσχνοτέρα, οὐ πλησιάζουσα τῷ μηρῷ. Ὑπέσταλται δὲ κατωτέρω· καὶ ἔστιν αὐτῆς τὸ πέρας ὁ ἔξω κόνδυλος, ὃν ἔνιοί φασι τῶν ἰδιωτῶν ἀστράγαλον προσαγορεύεσθαι. Χόνδρῳ μέντοι κατὰ πέρας συνδεῖται πρὸς ἄλληλα. Ἐπὶ δὲ τῆς συμβολῆς τῆς κνήμης καὶ τοῦ μηροῦ ὀστοῦν ἐπίκειται λεγόμενον ἐπιγονατὶς, δισκοειδὲς κατὰ σχῆμα, τὴν σύμφυσιν ἔχον μέσην, ὃ κατὰ μὲν τὴν κάμψιν τῇ κνήμῃ μᾶλλον προσχωρεῖ, κατὰ δὲ τὴν ἔκτασιν ἐπὶ ἑκάτερον πίπτει. Ἐκ δὲ τῶν πρὸς τοῖς σφυροῖς μερῶν ἡ κνήμη στενοῦται ποσῶς, καὶ σιγματοειδῶς τῷ πέρατι κατὰ τὸ ἴσον διΐσταται οὕτως ὥστε τὴν μὲν ἐπιμήκη ὑπεροχὴν ἔχειν, τὴν δὲ σμικροτέραν· καὶ ἔστι τῆς μὲν μείζονος ὑπεροχῆς ὁ ἔσωθεν κόνδυλος· ὁ δὲ τῆς ἄλλης κρυπτόμενος σαρκὸς ἐπιφύσει· συνήρμοσται δὲ τῷ τῆς περόνης ἀπολήγοντι, ὃ καὶ ἐπιπροβὰν τὸν ἔξω κόνδυλον, ὡς ἔφαμεν, ἀποδείκνυσιν· ὥστε εἶναι τὸ μεταξὺ διάστημα τοῖν δυοῖν ὀστοῖν σιγμαοειδές.

Ἐν ᾧ διαστήματι ὁ ἀστράγαλος ἔγκειται, οὗ καὶ ἐπιβέβηκε τῷ αὐτῷ κατὰ τὸ τέτρωρον· ἀλλὰ ὁ χῖος καὶ τὸ ἓξ παράκειται τῇ τῆς κνήμης καὶ [τῇ] τῆς περόνης ἀποφύσει· τὸ δὲ ἐπιτριῶν ἐπιβέβηκε τῷ ὑποτεταγμένῳ αὐτῷ ὀστῷ τῆς δὲ πτέρνης λεγομένῳ, ὡς πρὸς ταῖς τῆς πτέρνης κοιλότησιν ἀντικατακλείεσθαι τὰς τοῦ ἐπιτριῶν ἀνωμαλίας, καὶ συνδεῖσθαι χόνδρου περιφύσει· τὸ δὲ ἔμπροσθεν αὐτοῦ σφαιροειδὲς μέρος [συνήρμοσται] κοιλότητι ἑνὸς ὀστοῦ τῶν τοῦ ταρσοῦ λεγομένου διὰ τὴν κοιλότητα σκαφοειδοῦς. Ὀκτὼ δὲ τὸν ἀριθμὸν ὀστάρια τὸν ταρσὸν ἀποτελοῦνται ταῖς γωνίαις ὄντα ἀνώμαλα. Μετὰ δὲ τὸν

ταρσὸν ὑπόκειται τὸ πεδίον ἔχον ὀστᾶ πέντε, λεπτὰ μὲν κατὰ μεσότητας, παχύτερα δὲ κατὰ τὰ ἄκρα, ἀγόμενα δὲ κατὰ τὸν ἄνω τύπον, ὅθεν ἐκ τῶν ὑποκειμένων κοῖλα ὁρᾶται. Ἐξῆς δὲ τούτων αἱ τῶν δακτύλων σκυταλίδες καθάπερ καὶ χειρός. Ἀποδέδοται ἡμῖν κατὰ τὸ ἐνδεχόμενον καὶ ἡ τῶν ὀστῶν θέσις

Translation of Rufus' *On the Names of the Bones of Man*

The forehead is soft. The nape is the upper, raised section on the back of the neck. The top of the head is the crown. The temples are membranous parts on the sides of the face. A meninx is a membrane of the head. The brow is the part of the face beneath the forehead. The hairs growing around the temples are called "whiskers." And the folds of skin covering the eyes are called eyelids. On the two sides of the eyes are the corners of the eyes. The image (*eidolon*) in the middle of the eye is the pupil. The colored part stationed here is the pupil or eyeball. Other areas in the eye include the colored line encircling the pupil, the white, and the iris. The bones situated under the eyes are known as the under-eyes, lower eyes, and cheeks.

The openings of the nose are called "sinuses" (*mukteres*) and "nostrils" (*rhothones*). The midpoint of these openings is the partition. On either side of the nostrils are "wing flaps." The endpoint of the nose is the "sphere." The groove atop the lips is the philtrum. And the depression below the lip is the labret (*numphe*).

The "wing" is the lower bit of flesh leaning on the ear. On either side are the helix and lobe. We also find the cheeks, jaws, and jawbones. On the lowest part of the face are the chin and bearded area. The hair on the lips is called a moustache. Other hair includes the two endpoints of the moustache leading to the two sides of the lips, the hair on the groove atop the lips, and the *pappoi* (cheek hair). The beard is hair on the sides of the face.

The four teeth in the front of the mouth are the incisors. The molars, “corners,” “tables,” and *krantarai* are the remaining teeth. The innermost and latest to develop are the wisdom teeth. The grinding teeth are located beside the tearing teeth.

On the back of the neck are tendons; in the front are the throat, “gleaming part” (*glaukonia*), and the depression above the clavicles. The head is located at the top of the neck. The top of the upper arm is the shoulder. The hollow at the top of the arm is the armpit. Immediately after the shoulder is the upper arm. The sharp point, on which we prop ourselves when we lean, is known as the “bend of the arm,” the “point of the arm,” or simply the “elbow.” After the bones of the elbow, we find the ulna, and atop that, the radius. Then follow the flat and fused bones of the wrist: the metacarpus, tarsus, and fingers.

The finger set apart from the others is the large one (thumb); the first of the four remaining fingers is the pointer finger. Then comes the middle finger and after this, the one adjacent to the middle finger (ring finger), and the little finger. The bones of the fingers are called the “sticks” and phalanges. In some cases, the largest of all the fingers is said to be the middle finger, and the largest after that is the pointer finger and then the ring finger. The first joints are called the procondyles. Between the thumb and pointer finger is the palm. In the middle of the fingers is a flat area.

At the front and lower part of the throat is the chest, and at the rear of the throat is the back. The midriff extends up to the end of the spine. The loins are located at the base of

the spine; also there we find an area variously called: (1) the part below the navel, the belly, the stomach, the lower belly, and the lower stomach.

On the genitals, the pubic region, the pubic bones, and the pubis we find hair which grows in rings. The part of male genitalia which hangs down is known as the "stem" or shaft. The extremity of the organ is the glans, and the skin around it is the foreskin. The skin of the testicles is called the *orchis* or *orcheis.* The testicles are generative.

The last bone at the bottom of the back is the sacred bone or under-bone The area under the ribs is soft, loose, and hollow. It is the endpoint of the bones of the torso.

There are two bones in the thigh: the first one is the femur; the other lies along the femur. The higher of these bones is called the patella, or "bone abutting the thigh." At the bottom of the thigh, near the tibia is the knee. The hamstring, located at the rear of the leg, is that by which we bend our knees.

There are two bones of the lower leg: in the front, there is the shinbone, and behind it, is the "rod" or tibia. The end of these bones is called the "hammer." The middle of them is the *psachnon*, and the muscle attached to them is the gastrocnemius.

The "field" or sole is the broad area in the front of the foot. The "chest" is located below the arch of the foot and is the area from which the digits emerge. They are called "digits" just like the parts coming from the hand. The sole is located under the foot.

Chapter 2

Rufus' View of Humanity

The notion that man is set apart from the other animals is taken for granted in much of Greek literature. In the Byzantine period, Leo compiled a handbook on the nature of man in which he argued that (adult) man is set apart by his rational pursuits. And of course, we find this idea in earlier texts. In Plato's *Republic* 441A, for instance, we find that the rational part of the soul, *to logistikon*, is missing in animals and children. And in the *Laws* 80D, children are described as being as intractable as beasts; they are in the same category as other, non-human creatures. This same idea appears in Aristotle's *HA* 588a.[68]

Lurking behind all these examples is the idea that man *must* be unique among animals. Indeed, Robert Renehan refers to the widespread topos of "*monon ton zoon anthropos*" in Greek literature.[69] This topos manifests itself in a range of ways, from the unique patterning of body hair to participation in the divine. Among the possibilities for man's uniqueness, Plato's *Cratylus* 399C suggests that only man can reflect.[70] Also popular is the notion that rational speech, *logos*, separates us.[71] And there are physiological differences as well. Man, it is claimed, has sensitivity to certain smells, not because they suggest the presence of food or warn of danger, but simply because they are

[68] The phrase "*zoon logikon*" is widespread. See Chrysippus *ap.Plut.*450D.SVF 3.95-12.
[69] Renehan (1981), 246.
[70] Cf. Alcmaeon Fr.1a D-K and Arist. *Pol.*1253a9.
[71] Isoc.*Panegyricus* 4.47-50; Xen. *Mem.* 1.4.12; Arist. *HA* 536b1-2.

pleasant.[72] Man is capable of laughter.[73] And looking at the most externally obvious, man is unique both in the dexterous use of his hands and in his bipedalism.[74] My aim in this section is to explore Rufus' answer to this issue of humanness. To be sure, Rufus himself never explicitly poses this question, but in what follows, I shall try to tease out whether humanness is something that is implicitly important to him. In his anatomical texts, what distinguishes the parts of our bodies as uniquely human? And how does he go about answering this question given his limitations, of which there are many?

To describe the elements of the human body, Rufus needs, in the first place, to explain what constitutes "human." What, exactly, does he consider to be normal and normative? And what represents a deviation from this norm? The simple answer is that for Rufus, like for everyone else in antiquity, what is human is what is like him – adult, male, Greek, and free-born. Of course, he is not going to put himself on display, so his medical discussions necessarily focus on those who are different from him to various extents – namely, slaves and primates. But as I shall discuss, these discussions need to be seen through his Greek/free/male lens.

Rufus' project of labeling the parts of the human body is enabled by two main props: (1) a slave to demonstrate the external parts and (2) a monkey for the internal ones. However, both of these tools are something of a concession for Rufus, as neither represents his ideal human. He would prefer to have a living, male, Greek human to vivisect. But cultural mores dictate that he use an animal cadaver. And limitations of his setting preclude using naked women or free males. It also seems that Rufus is limited to a single model each for the internal and external parts; so he does not have access to a

[72] Arist.*De Sensu*.444a3.
[73] Pollux 6.200; Sext.Emp.*Outlines of Pyrrhon.*2.11; Lucian.*Vit. Auct.*26.
[74] Xen.*Mem.*1.4.11 and Arist.*PA.*687a4.

range of pathologies or ages. To be sure, Rufus notes that the monkey is man's closest non-human relative. Yet he feels obvious nostalgia for the time when human dissection was a viable option. And similarly, Rufus is eager to use the slave, though his narrative betrays a clear preference is for Greek-born males. However, despite these limitations, Rufus does not seem terribly bothered. Women and the elderly were simply less important to him; they were, in a manner of speaking, "imperfect men." And it would be too unthinkable for him to display a Greek man. Indeed, Rufus' only real regret, which we will see in his segue from the external to the internal parts, seems to be that human dissection is no longer possible.

Rufus' Use of the Monkey

In explaining the parts of the human body, Rufus' main tool is a monkey cadaver. Indeed, in his *Onom.*, Rufus devotes 252 lines of Greek to this section of the lecture, versus the 211 lines that he uses with the slave as his model. Comparative anatomy is obviously important for Rufus. Yet he also makes clear that despite their similarities to humans, monkeys are imperfect stand-ins, and he would prefer to demonstrate on a human. So the question is: Why does Rufus use a monkey instead? The answer is two-fold: (1) because of cultural restrictions, he cannot dissect a human and (2) monkeys are the closest non-human approximate he can get.

Since prohibitions against human dissection were the major factor limiting Rufus' lecture materials, it is worth delving into its process. Human dissections were performed most prolifically by Alexandrian physicians, and that Rufus feels envy over this is evident: καὶ ἦν πολλὴ δόκησις σπερματικὰ ταῦτα εἶναι, καὶ τοῦ γένους τῶν κιρσοειδῶν.

Τοῦτο μὲν δὴ οἷόν ἐστιν, αἱ ἀνατομαὶ τάχα δείξουσιν (*Onom.*186). [75] Yet to credit the practice solely to the Alexandrians might be presumptuous, and there is some debate about its first appearance. Some scholars claim that even Homeric doctors performed dissections, since the anatomical knowledge displayed in Homeric poems is particularly learned.[76] But the idea that vivisection was morally unthinkable was first stated by Welcker.[77] Homeric doctors said that injuries from wounds were not large enough for close examination of internal organs, Hippocratic doctors never mention human dissection. Rather, they rely on external examination as well as comparisons with other animals.[78] Despite the proliferation of the practice of dissection, at the start of the Empire, the climate became less philosophical and more superstitious, and by the time Rufus began practicing and teaching, dissection was no longer a viable option. And in his *Onom.*, Rufus seems nostalgic for the old days when this practice was a possibility.

However, following Rufus, the use of non-human animals for medical experimentation once again became extensive. Galen, for instance, used pigs when testing the voice, because they squealed the loudest.[79] Experimentation is more difficult on living animals because the blood is harder to control. To this end, Galen devised a trussing system to check its flow. Despite their seemingly ritualistic tendencies, Galen's anatomies lacked the elements of sacrifice – that is, fire, prayers, barley, etc. And though he used predominantly non-human animals, his *Anatomical Procedures*, Galen notes the homologous elements between humans and apes: innards, muscles, arteries, veins,

[75] "It is a great supposition that these are spermatic vessels of the vascular kind. Perhaps dissections will show what sort they are."
[76] O. Korner (1922), 1484.
[77] Welker (1850), 218.
[78] Hipp.*On the Heart.*IX,80.
[79] Galen. *Anat, Proc.* II.627.

nerves, and bones.[80] However, he is wary about using non-human primates, as he considered their facial expressions during vivisection to be disturbing; the sight is terrible (*eidechthes*) and too human.[81] Rufus did not perform vivisection and nowhere discusses the ethics of animal experimentation.

Given that Rufus cannot perform human dissection, his second best option is to rely upon comparative anatomy. There certainly was precedent for this in the Peripatetic and Alexandrian traditions. Aristotle, in particular, emphasized the utility of comparative anatomy, especially when the species share a sufficient number of features. And looking to the Alexandrian tradition, though Herophilus' anatomy was almost certainly based on human dissection, but it used comparative anatomy as well. And at several locations, Herophilus compares human organs to those of animals. In fragment 60, for instance, Herophilus notes similarities between the hare and other animals. And we also have Galen's statement in fragment 61 that Herophilus described the "testicles" (ovaries) in various female animals. But there are, of course, problems associated with the inexactness of comparing disparate species. According to Theophrastus, "to insist at all costs on comparing what cannot be compared is an exaggerated undertaking because it embraces the danger that in the end, one misses the approach most suited to the study of the object."[82] For this reason, Alexandrians began dabbling in human dissection.

Despite his extensive use of comparative anatomy to demonstrate the internal workings of human organs, Rufus makes clear that human bodies differ from those of other animals. Some of these differences manifest themselves in the form of superlatives: Humans have the largest brains, for instance:

[80] Ibid. II.219.
[81] Ibid. XI.104 and II.690.
[82] Theoph.*Historia Plantarum*. I.1.4.

> **(3.)** Ἐν τῇ κεφαλῇ τοίνυν περιέχεται κατὰ τὴν κοιλότητα τοῦ κρανίου σὺν ταῖς περὶ αὐτὸν μήνιγξιν ὁ ἐγκέφαλος, κατὰ σύγκρισιν πρὸς τὰ ἄλλα τῶν ζῴων ὡς ἐπὶ ἀνθρώπου μείζων ὑπάρχων
>
> [3] In the head, the brain -- along with the membranes surrounding it -- are encapsulated beneath the walls of the skull. The human brain appears larger, with respect to the rest of the body, than that of animals.

Humans also have the broadest chests:

> **(74.)** Κλεῖδες δὲ τὰ ὑπὸ τῷ τραχήλῳ ὀστᾶ· αὗται πρὸς τὸ στῆθος ἠρθρωμέναι εἴργουσι τοὺς ὤμους καὶ τὰς ὠμοπλάτας μὴ συμπίπτειν, ὥσπερ τοῖς ἄλλοις ζῴοις· ἐκεῖνα γὰρ κλεῖδας οὐκ ἔχει· διὰ τοῦτο καὶ ἄνθρωπος πλατυστερνότατος.
>
> [74] The clavicles are the bones under the neck. Fastened near the chest, they prevent the shoulders and shoulder blades from falling together, as they do in other animals. For they (the animals) do not have clavicles. It is for this reason that man has the broadest chest.

It is not to say, however, that Rufus always sharply distinguishes humans from other animals. Monkeys are most similar to humans and share a number of structural similarities:

> **(127.)** Τὰ μὲν οὖν ἐπιφανῆ, ὦ παῖ, σὺν τοῖς ὑποκειμένοις ὀστοῖς οὕτω χρὴ καλεῖν τὰ δὲ ἔνδον τουτονὶ τὸν πίθηκον ἀνατέμνοντες, ὀνομάζειν πειρασόμεθα· ἐγγυτάτω γὰρ τὴν φύσιν ἀνθρώπου καὶ τοῖς ὀστοῖς, καὶ τοῖς μυσὶ, καὶ τοῖς σπλάγχνοις, καὶ ταῖς ἀρτηρίαις, καὶ ταῖς φλεψὶ, καὶ τοῖς νεύροις·
>
> [127] These, then, o child, are the visible parts -- along with their underlying bones -- that it is necessary for us to name. We attempt to name the internal parts by dissecting the monkey, since monkeys are most similar in nature to man -- in terms of their bones, muscles, viscera, arteries, veins, and nerves.

After monkeys, Rufus posits a hierarchy of relatedness based on the number of digits and rows of teeth that a creature possesses. After monkeys, which share musculature, skeletal, and nervous similarities, the animals closest to humans have feet divided into many digits. Second are those with a double row of teeth. Then come cloven-hoofed animals with two rows of teeth, and last are those animals with a single row of teeth and no

cloven hoofs: δεύτερα δὲ τὰ ἄλλα τὰ πολυσχιδῆ· τρίτα τὰ ἀμφώδοντα τῶν διχήλων· τὰ δὲ μὴ ἀμφώδοντα καὶ μώνυχα, προσωτάτω (*Onom.* 127).[83]

Incidentally, it is unclear whether this "double row of teeth" (*amphodonta*) implies (1) having a single row of teeth on both an upper and a lower jaw, totaling two rows, or (2) cycling through two sets of teeth – a juvenile and adult set. But the former option seems the likelier one since observations of the teething patterns of multiple species would have been more difficult than observing the simple presence of teeth on jaws. Incidentally, that mammals could have multiple rows of teeth is not as absurd a suggestion as it sounds. Rarely, humans can have two rows of teeth on the same jaw, a condition known as "shark teeth," but this only happens when a child's adult teeth form behind, rather than underneath, the juvenile ones. Eventually, the permanent teeth will dissolve the roots of the juvenile teeth.[84]

But in any event, it is worth questioning why digits and jaws are so important to Rufus. In *Onom.*47, he details the structure of the human jaw. By definition, it has upper and lower mandibles. The jaw is significant to Rufus because, internally, it is the place to which teeth and the tongue attach, and these parts are necessary for eating. As I shall discuss in the section on metaphors, diet is a central concern for Rufus, since it is suggestive of certain, uniquely human behavioral patterns. Jaws are also important to Rufus because, externally, they are the place to which facial hair attaches. And facial hair is a key marker of being an adult, Greek male. And deviations from Rufus' ideal -- women, the young, and non-human animals -- do not possess this hair.

[83] "The second most similar are the animals which have feet divided into many digits. Third are the cloven-hoofed animals that have a double row of teeth. Those that do not have cloven-hoofs and have only a single row of teeth are most unlike man."
[84] Cameron (1997), 218.

To help flesh out Rufus' distinction between humans and other animal species, it is worth turning to Aristotle's *Historia Animalium*, as that work provides a backdrop for Rufus' own arguments. Before looking at the details in Aristotle's text, the connection between the *Onom.* and the *HA* should be stressed. Rufus refers to Aristotle three times in his *Onom.*, and all of the references are from the *HA*. In *Onom.*43, Rufus refers to the Aristotle's use of the word "earlobe:" λοβὸς δὲ, τὸ ἐκκρεμὲς, ὅπερ καὶ μόνον Ἀριστοτέλης φησὶ τοῦ ὠτὸς ὀνομάζεσθαι, τὰ δὲ ἄλλα ἀνώνυμα εἶναι. In *Onom.*61, Rufus references Aristotle's discussion of the appearance of the uvula: Ἀριστοτέλης δὲ σταφυλοφόρον αὐτὸ καλεῖ, ὅτι φλεγμήναντος σταφυλῇ τι ὅμοιον ἐξ αὐτοῦ κρεμάννυται. And in *Onom.*209, Rufus explains Aristotle's argument that the aorta is exceptionally large. Ἀορτὴν δὲ Ἀριστοτέλης ἐξαιρέτως τὴν διὰ τῆς ῥάχεως ἀρτηρίαν ὀνομάζει, ἥ τις μεγίστη παρατέταται τῇ ῥάχει.

But in addition to these explicit references, Rufus' *Onom.* follows the general structure of Book 1 of the *HA*. Like Rufus after him, Aristotle divides his discussion of the parts of the body into two halves: the internal and the external. And he begins his section on the external parts using a human as his model, because we are more familiar with our own anatomy than we are with that of other animals:

> Πρῶτον δὲ τὰ τοῦ ἀνθρώπου μέρη ληπτέον· ὥσπερ γὰρ τὰ νομίσματα πρὸς τὸ αὐτοῖς ἕκαστοι γνωριμώτατον δοκιμάζουσιν, οὕτω δὴ καὶ ἐν τοῖς ἄλλοις· ὁ δ' ἄνθρωπος τῶν ζῴων γνωριμώτατον ἡμῖν ἐξ ἀνάγκης ἐστίν.
>
> First we must consider the parts of man. Just as anyone those with which he is most familiar, so we must do in other matters. And man is the animal with which we are most familiar, of necessity (491a19-21).

Aristotle then notes that the main parts of the human body are the head, neck, trunk, upper and lower extremities: Μέγιστα μὲν οὖν ἐστι τάδε τῶν μερῶν εἰς ἃ διαιρεῖται

τὸ σῶμα τὸ σύνολον, κεφαλή, αὐχήν, θώραξ, βραχίονες δύο, σκέλη δύο (491a28-9). Compare Rufus' treatment: Ἔστι δὲ τὰ μέγιστα μέρη τοῦ σώματος, κεφαλὴ, καὶ αὐχὴν, καὶ θώραξ, καὶ χεῖρες, καὶ σκέλη (*Onom.*11). He next scans the external parts top to bottom, a pattern that Rufus follows with few deviations. The differences that do occur are minor, discussing the nose before the ears, for instance.

Aristotle's second half turns to the internal parts, and there he explains that we must turn to comparative anatomy, as we are unable to look at human viscera. Aristotle additionally notes that under dissection, the monkey's organs match those of man: Τὰ δ' ἐντὸς διαιρεθέντα ὅμοια ἔχουσιν ἀνθρώπῳ πάντα τὰ τοιαῦτα (502b25). Aristotle's discussion is, however, more explicitly comparative than Rufus'. While Rufus mentions the monkey at the outset of his lecture, his subsequent arguments focus solely on the human. Aristotle, on the other hand, frequently mentions other species, notably pigs and oxen.

Since Rufus' *Onom.* follows the general structure as well as multiple examples from Aristotle's *HA*, it is worth turning, more specifically, to Aristotle's text to see how it distinguishes the various species and what it suggests might be uniquely human. Unlike Rufus who notes only structural differences, Aristotle explains that animals differ from one another in their modes of subsistence, their habitats, and their anatomical parts: Οὐ μὴν ἀλλ'ἔνιά γε καὶ ἐν τούτοις ἕτερα ἑτέροις μόρια ὑπάρχει, οἷον τὰ μὲν ἔχει πλῆκτρα τὰ δ' οὔ, καὶ τὰ μὲν λόφον ἔχει τὰ δ' οὐκ ἔχει (487a11). Turning to specifics, Aristotle says that some animals live in water, while others live on land (487a15). Animals also differ in the way they feed. Some are carnivorous; some are gramnivorous; and other are omnivorous (488a15). In terms of habitation, Aristotle notes that some animals live in

groups, while others are solitary (487b34). And of the social animals, birds, bees, and man all submit to rulers (488a11). Dwellings likewise vary: some animals make their own, like the mole, mouse, ant, and bee, while others require no fixed home (488a20). In terms of their skills, some animals are musical, like humans and birds.[85] Animals also differ in their temperaments, being either combative or complacent. (488b8). It is clear, then, that for Aristotle, both behavior and anatomy are important considerations when classifying animals.

One point that Rufus takes for granted but which Aristotle stresses is that form and function are allied qualities. Looking specifically at the comment that human relatedness is linked to teeth and digits, Aristotle explains that horned quadrupeds have the sort of teeth they do *because* they eat the sort of things they do. Likewise, animals have the sorts of digits they do *because* they need to grasp objects and navigate their surroundings in unique ways. In 507b15, Aristotle makes an explicit link between teeth and diet. Those creatures with teeth equally in both jaws have one stomach; included in this category are man, pigs, dogs, bears, lions, and wolves. Horned quadrupeds, which are furnished with extra teeth for grinding, have multiple stomachs.[86] These same animals have no need for divided digits, as they do not grasp for their food. Though Rufus, too, notes that teeth and digits are linked factors which distinguish humans from other animals, he never makes a specific connect between anatomy and diet/habitat. Yet the similarities between his account and Aristotle's betrays his consideration of these factors.

[85] However, Aristotle notes that all creatures sing/chatter while having sex. Music is, then, tied to reproduction. (488a34-5).

[86] Aristotle says that all animals which are quadrupedal, blooded, and viviparous have teeth, but some have teeth in both jaws (*HA* 501a9-15). Aristotle even cites Ctesias' story of Indian animals called "martichoras" having a triple row of teeth (501a23).

Rufus explains that of all species, monkeys are the most similar to man, and in *HA*502a16-22, Aristotle makes a similar claim, although in his account, monkeys and apes act as a sort of blend between humans and quadrupeds. Turning to the details of his account, Aristotle explains that apes, monkeys, and baboons share properties of both men and quadrupeds (502a216-22). Monkeys are tailed apes, while baboons have the form of an ape but the teeth and demeanor of a dog. Apes are also a cross between humans and quadrupeds in their posture and hair growth patterns. In 498b17, Aristotle explains that while all viviparous quadrupeds have hair; bipeds have less, except on their heads. In other words, the part on top -- heads for humans and backs for quadrupeds -- are always covered with hair.[87] And in 498b20, Aristotle adds that quadrupeds have less hair on their bellies, while men have more. Apes, as an intermediate, have hair on their backs like quadrupeds but on their bellies, like humans. As for the uprightness of apes and monkeys, Aristotle notes that these animals have fingers which look like toes and hands which look like feet. For this reason, they are just as likely to be found on all fours as they are to be found on their feet (502b1). Men, on the other hand, have hands and feet that are distinct enough that they tend to practice near-constant bipedalism.

Despite their obvious difference from humans, birds, because of their bipedalism and musical abilities, deserve some discussion here. In Book 2 of the *HA*, Aristotle tells us that birds, more than other animals, have the faculty of uttering articulate sounds. And concomitant with this ability is the possibility of bipedal motion. However, it is in Book 3 that Aristotle's discussion is the most fleshed out. In Book 4, Aristotle tells us that insects have neither respiration nor voice. Likewise, mollusks, crustaceans, and fish cannot produce sounds. However, unique among the oviparous creatures are song-making birds.

[87] The rational for this is not explicit, but perhaps it has to do with protection from the sun.

Why birds are the only musical oviparous creatures is unclear, but Aristotle does explain that they are notably human-like in having two feet (unlike serpents, spiders, etc.). They can stand erect, and have their heads face the heavens, the locus of music. Nonetheless, Aristotle is quick to point out that birds are still less vocal than man: Μάλιστα δὲ τῶν ζῴων μετὰ τὸν ἄνθρωπον γράμματα φθέγγεται ἔνια τῶν ὀρνίθωνγένη (*HA* 504b1-2). And despite their bipedalism, birds cannot stand perfectly erect: δίπουν ἐστὶ τοῦτο τὸ ζῷον, οὐκ ὀρθόν (*PA* 695a3). The reason here is that they have a dwarf-like shape: Οἱ δ' ὄρνιθες οὐκ ὀρθοὶ μὲν διὰ τὸ νανώδεις εἶναι τὴν φύσιν (*PA* 695a8). They are, and always will be, as it were, not fully formed.

In a similar vein, Aristotle tells us, in *The Progression of Animals*, that human children also cannot walk erect because they too are dwarf-like, and their upper and lower extremities are disproportionate: οὐ γὰρ δύναται βαδίζειν ὀρθὰ διὰ τὸ πάντα νανώδη εἶναι καὶ ⌊ μείζω καὶ ἰσχυρότερα ἔχειν ἢ κατὰ λόγον τὰ ἄνω μέρη τοῦ σώματος τῶν κάτωθεν. (*IA* 710b12-15). Notice the repetition of the word νανώδη here; erect bipedalism is a function of maturity and vertical growth. It is only when children reach an appropriate size that they can walk fully upright: μέχρι οὗπερ ἂν λάβωσι τὸ προσῆκον μέγεθος, καὶ ποιοῦνται τότε τοῖς σώμασι τὴν βάδισιν τὴν ὀρθήν (*IA* 710b16-17) Verticality is, of course, tied to vitality. And indeed, there is a nexus of interlocking characteristics here which includes musicality, physical development, and greater rationality. But the most important implication of it all is that man occupies a unique place among the animals. Rufus' demonstration on the monkey is a concession then. It is a necessary approximation to be sure, but it is nonetheless a disappointment for him.

So we can see that the first part of Rufus' implied answer to the question "what is human?" is "that which is not a *zoon*." A human is like its closest relative, the monkey, in terms of its muscular, skeletal, and nervous systems; but it has a larger brain and full bipedal motion. However, a more complete answer about humanness actually requires a more nuanced question: What is *supremely* human for Rufus? And the answer to this is "that which is male." In an effort towards maximum inclusiveness, Rufus does, of course, touch on both male and female anatomy. But it quickly becomes clear that women are secondary for him. Indeed, Rufus does not even use a female model to point out female anatomy; a male slave is his chosen prop. The sex of the slave is clear from the outset of the lecture. Rufus uses male pronouns: Ἀκούων δὴ καὶ ἀποβλέπων εἰς τὸν παῖδα τοῦτον (*Onom.* 9). And the slave has facial hair: ἡ δὲ ἐπὶ τῷ ἄνω χείλει, προπωγώνιον· αὐξηθεῖσαι δὲ αὗται αἱ τρίχες, μύστακες· αἱ δὲ ἐπὶ ἄκρου (*Onom.* 49).[88] He also has male genitalia:

> **(101-3)** δοίων ἐπίσειον, καὶ ἤβην, ἄλλοι δὲ ἐφήβαιον καλοῦσιν. —Τῶν δὲ αἰδοίων, τοῦ μὲν τοῦ ἄῤῥενος ἡ μὲν ἀποκρεμὴς φύσις, καυλὸς, καὶ στῆμα· τὸ δὲ μὴ ἐκκρεμὲς, ὑπόστημα, καὶ κύστεως τράχηλος· καὶ ἡ διὰ μέσου γραμμὴ, τραμίς· οἱ δὲ ὄῤῥον ὀνομάζουσιν. Τὸ δὲ πέρας τοῦ καυλοῦ, βάλανος, καὶ τὸ δέρμα τὸ περὶ αὐτῇ, πόσθη, καὶ τὸ ἔσχατον τῆς ποσθῆς, ἀκροπόσθιον.
>
> Of the genitals, the part which hangs down in men is called the "stem" and shaft. That which does not hang down is called the base and the neck of the bladder. And the medial line is the perineum. Others call it the *orrhon*. [102] The extremity of the organ is the glans, and the skin around it is the foreskin. The extremity of the foreskin is the *akroposthe*.

[88] The hairs that grow on the upper lip are called a moustache. Those on the point of the chin are called *pappoi.* And those under the jaw are called *hypene* (goatee).

This description continues into sections 105-6: Τῶν δὲ διδύμων τὸ μὲν ἐπάνω, κεφαλὴ, τὸ δὲ κάτω, πυθμήν. Καὶ τὸ χαλώμενον τοῦ ὀσχέου λακκόπεδον (*Onom.* 105-6).[89]

Nonetheless, Rufus uses this male slave as a springboard for discussing female anatomy, including breasts and reproductive organs. In this way, it becomes clear that Rufus' narrative is an odd mixture of inclusiveness and selectivity. Though he describes both male and female anatomy, women are depicted as imperfect men; indeed they have both "testicles" and "semen:"

> **(197.)** Περὶ δὲ τοὺς διδύμους εἰσὶ χιτῶνες ἐλυτροειδεῖς καὶ δαρτοὶ, καὶ νεῦρον εἰς τὸν δίδυμον καθῆκον κοῖλον,ὃ καὶ ἀορτὴρ καὶ κρεμαστὴρ καλεῖται, καὶ φλεβία διὰ ὧν τρέφονταιοί δίδυμοι· καὶ ταῦτα τρέφοντα τὸν δίδυμον καλεῖται.
>
> Around the woman's "testicles" are case-like and incised membranes. A hollow nerve also gives way to the testicles. This nerve is called the "cord" and *kremaster* (suspension). We also encounter veins which carry food through them; these are called the nourishing testicular veins.

One factor to bear in mind when considering this equation of male and female bodies is that it would have been difficult for doctors to gain access to female bodies. As Rouselle discusses,[90] obstetrics was largely a female activity: During delivery, doctors would be available in case of emergencies, but in general, midwives would be in charge.[91] For routine gynecological examinations, women checked themselves, sometimes discovering polyps and calluses, which they would self-cauterize.[92] And as noted, dissection was only practiced in limited ways. In many cases, doctors had to rely on observation of female

[89] The upper part of the testicles is called the head; the lower part, the base. The area hanging down from the loins is the *lakkopedon* (scrotum).

[90] Rouselle (1988).
[91] Gal..*Nat.Fac.*III.3; *Gyn.*IV.7.
[92] Gal. *Diss.Women.*40.

animals. This, incidentally, is why Galen suggests that women have a double womb.[93] In any event, the mysteriousness of female bodies led to a vocabulary for reproductive organs that was the same for both men and women. Ovaries were "testicles." Fallopian tubes were "vas deferens." And female seed was thought to exist. The only real exceptions to this equation of male and female parts were the uterus and the external parts of female genitalia.

On the topic of female seed, Pythagoras, Epicurus, and Democritus suggest that the female does emit seed, but her spermatic ducts face in the wrong direction. Aristotle and Zeno argue that women secrete a wet substance, like sweat from exercise, but it is not "cookable" seed. And within the Hippocratic corpus, women do emit seed, but it falls outside of the womb. In the two-seed theory, developed in *Genit.*4-6, *Nat.Puer.*12, *Morb.*4.32, and *Vict.*27-8, both the male and female produce seed, though the male's is stronger. The contribution of large amounts of strong seed results in a boy, while large amounts of weak seed results in a girl. A lot of strong seed plus a little weak seed yields a boy, and the opposite yields a girl. However, it is not clear what determines the amount and kind of seed contributed by each parent.

Despite the similar vocabulary, most authors noted underlying differences between male and female physiology. Among the gynecological treatises, one prominent difference is women's lack of innate heat. As an early example, Empedocles said that men are naturally hotter.[94] And in Aristotle's corpus, the body condenses by a form of cooking (*pepsis*), and there is a decreasing scale of heat among all living organisms: men

[93] Gal..*De Uteri Dissectione.* Ed. Kühn vol.2. pp. 887-908.
[94] Fr.A81, B65, B67.

< women < animals < plants.[95] Men's greater heat transforms any excess of nutrition into sperm, but women cannot do this task completely. In Aristotle's scheme, there is an equation of menstrual fluid with semen: semen is made from blood but is white because it is concocted from the male's innate heat.[96] Females lack this heat, so their semen does not change its appearance. This equation is not without explanation: menarche happens around the same age that semen appears, and menopause happens at the same time that "generative power fails" in men.[97] However, Aristotle does not account for the different timing of menstruation and male ejaculation. Nonetheless, this heat-centric view exists beyond the Aristotelian corpus. For both Herophilus and Galen, it is extra heat that allows male genitalia to grow externally.[98] The woman's genitals are less formed, and semen from her "testicles" are colder and weaker.[99]

And connected to coldness is the notion that women are wetter and have more porous flesh than men.[100] Female pathology tended to involve an inability to remove excess fluids, so menstruation, intercourse, and childbirth are necessary for continued female health.[101]There is also general consensus about the shape of women's reproductive organs, in the sense that they are thought to be hollow, like a *pithos;*[102] they have a bottom (*fundus*), neck (*cervix*), and mouth (*orificium*).[103] The Hippocratic *On Ancient Medicine* 22 likens the womb to a suction cup.[104]

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[95] See especially Arist.*PA.*681a12-28, *GA.*732a12-339a18.
[96] Arist.*GA.*7227a1.
[97] Ibid, 727a5.
[98] Galen.*UP.*14.6-7
[99] Galen. *On the Usefulness of the Parts of the Body.*14.11.296.
[100] Hipp. *Diseases of Women.*1.1
[101] While Soranus rejects humoral theory, he also holds that the female body needs to rid itself of moisture.
[102] Hipp.*Mul.*1.33; *Epid.*6.5.11
[103] Sor.1.9 and Ruf.*Onom.*193.
[104] Cf. Sor.1.9 and Galen.*Sem.*4.516.1.

Another distinguishing feature for women was that their reproductive organs were seen as inherently unstable. The idea of a wandering womb was popular with Plato and the Hippocratic writers, as well as later Roman and Byzantine authors. In this view, the womb was variously seen as a defective body part, an animal, and a demon who poisons women. Hippocratic authors tended to focus on the aggressive activities of the womb; it can leap upon (*emballein* and *epiballein*), fall upon (*prosiptein*), rush (*thein*), and urge on (*parotrunai*) other internal organs.[105] And to keep the womb stable, these authors suggest women marry young (close to menarche) and engage in frequent intercourse, so that the womb would be heavy and be less apt to move. Therapy is also introduced to reposition a womb that has wandered: if it has risen to the diaphragm or liver, sweet-smelling substances are applied vaginally, and foul-smelling substances are applied to the nostrils. But if a womb has descended, the reverse order is used. To be sure, the practice of human dissection would have challenged the notion of the wandering womb, as ligaments holding the womb in place would have been visible.[106] But even so, this had little effect on some of the later authors: Arataeus, a contemporary of Galen, in his *Causes and Symptoms of Acute Diseases,* explains that the womb behaves like an animal within an animal.

Part of the reason for this sort of wild movement was that the womb is envisioned as hungry. It falls upon the male seed and ingests it.[107] Indeed, the womb has a "mouth" to close around the seed, and if conception does not occur, the womb will vomit it out.[108] Linked to this is the idea of appetite and sexual desire:

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[105] Hipp.*Diseases of Women* 1.22.1.
[106] Arist.*GA*.720a12-14.
[107] Hipp.*Mul.*1.24, Sor.1.10.
[108] Soranus in 1.36, 1.43, 1.46 views the womb as having a stomach as well. Cf. Galen.*Sem.*4.523.10.

προσεθήκαμεν δὲ ὅτι καὶ ὁρμῆς καὶ ὀρέξεως πρὸς συνουσίαν ὑπαρχούσης. ὡς γὰρ χωρὶς ὀρέξεως οὐκ ἐνδεχόμενον ὑπὸ τῶν ἀρρένων τὸ σπέρμα καταβληθῆναι, τὸν αὐτὸν τρόπον χωρὶς ὀρέξεως ὑπὸ τῶν θηλειῶν οὐκ ἐνδεχόμενον αὐτὸ συλληφθῆναι. καὶ ὡς ἡ τροφὴ χωρὶς ὀρέξεως καταποθεῖσα καὶ μετά τινος ἀποστροφῆς οὐ καλῶς ⌊κατατάσσεται καὶ τῆς ἐπιβαλλούσης ≤ἀπο≥τυγχάνει πέψεως, οὕτως οὐδὲ τὸ σπέρμα δύναται ἀναληφθῆναί τε καὶ κρατηθὲν κυοφορηθῆναι δίχα τοῦ παρεῖναι πρὸς συνουσίαν ὁρμὴν καὶ ὄρεξιν.

For just as it is impossible for seed to be ejaculated by males without the urge and appetite, in the same way it cannot be taken up by females without the urge and appetite. And just as food swallowed without appetite or with a certain revulsion is not well assimilated and fails in its subsequent digestion, so too the seed cannot be taken up. Or if it is taken, it cannot be carried to term without the presence of the urge and appetite for intercourse. (Sor.1.37)

The best time for intercourse, then, is when desire is present. For this reason, female sexual pleasure was an important consideration, as a "matter of pronatalism."[109] But it also was a matter of expediency.

But women are not the only ones to occupy a space below men. In discussing deviations from the norm, it is also worth discussing eunuchs, who for Rufus, comprise an intermediate category between women and men. In his *Anat.*58, Rufus describes them as having male reproductive organs which do not function properly. Their sperm is sterile and source from glands which are non-generative:

(58.) Πλὴν συζυγέντα ἐξ ἑκατέρου μέρους κατίασιν ἀπὸ τῆς ῥάχεως ἀνὰ δύο· καὶ τὰ μὲν ἄγονα συνεμφύεται τῷ τραχήλῳ τῆς κύστεως· τὰ δὲ κιρσοειδῆ διὰ τῶν βουβώνων εἰς τοὺς χιτῶνας τῶν διδύμων παρὰ ἑκάτερα· ὅθεν οἱ εὐνουχισθέντες σπερμαίνουσι μὲν, ἄγονον [δὲ] ἐκ τῶν ἀδενοειδῶν, τῆς ἐκ τῶν κιρσοειδῶν ἀποκρίσεως οὐ δυναμένης σώζεσθαι διὰ τὴν πήρωσιν τὴν περὶ τοὺς διδύμους.

[58] The rest of the vessels, joined together, descend from the spine two at a time. The infertile vessels attach to the neck of the bladder, while the varicose vessels travel through the groin and attach to either side of the testicular membranes. Eunuchs do produce sperm, but their sperm is sterile and comes from the glands.

[109] Hanson (1990), 315. And in the case of rape, Soranus explains that appetite is still present; it is just that the mind objects.

> The power of the semen from the varicose channels is not preserved if the testicles are removed.

Indeed, Rufus fits into a tradition that views both eunuchs and women as failed men. These prejudices abound in Aristotle's biological works and in the Hippocratic corpus. Aristotle believed that vital heat came from the heart but was retained by the sperm. In this way, sperm became a source of untapped nourishment. Males could use heat to change this food into blood. But since women lacked heat, they could not make sperm. And likewise, eunuchs lacked both heat and sperm. Peter Brown refers to the "slippery slope" of gender anxiety, a downward trajectory into a feminized state.[110] At the top of the hierarchy is the perfect male; below him are prepubescent children, women, elderly men, and eunuchs.

As an addendum to this point, in his discussion of gonorrhea, Aretaeus of Cappadocia, a second century CE medical writer, says that when the sexual organs of men are compromised because of disease, they become cold and womanlike. In contrast, "a man with healthy semen is warm; his joints work well; he is hairy; he has a good voice; and he is clearly recognized as a man." But when one compares the healthy man with the eunuch, he will find that the eunuch is "weak, lethargic, high-voiced, and womanlike."[111] According to Aristotle, during sexual intercourse, blood and warmth travel from the brain to the genitals. Because of this, hair follicles on the scalp die, and baldness results. Children and eunuchs, on the other hand, have full heads of hair.

[110] See Kathryn Ringrose's discussion of Brown's position in Ringrose (2003), 53.
[111] Aret. *On Gonorrhea* 2.5.

Woman are, so to speak, failed men. They lack vital heat, and so they are softer and colder. [112]

In this way, maleness is held to be "both normal and normative,"[113] while the female is just an imperfect derivative. In fact, the further one moves from the masculine ideal, the more monstrous the individual becomes. The first deviation from this standard is the female; she is like an inverted male. Then, in descending order of masculinity, follow hermaphrodites; androgynes; and lastly, miscarried fetuses, entities which are so unlike men that they are, in fact, lifeless.[114] This scheme allows for two main sexual categories: men and imperfect men – that is, those who have somehow fallen off the ideal.

To understand the reasons for this duality, it would be necessary to discuss the process of sex differentiation. But unfortunately, Rufus is silent on this point, and if we want to propose reasons for his male/female distinctions, we need to look to other medical texts. Turning to a later tradition, Galen believed that sex emerged both from the opposition of male and female principles (in the male and female seed) and from the seed's location within the womb. Galen explains that the human womb is bicornate;[115] male embryos develop in the right chamber; and females, in the left, though it is not clear how the seeds arrive at their respective sides. The right chamber of the womb is markedly warmer;[116] and for this reason, males form faster than females — in thirty-nine days, as

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[112] The notion that women and castrates are imperfect men extends beyond the medical realm and even insinuates itself -- rather unexpectedly, perhaps -- into technical treatises in architecture and music. In his musical treatise *De Musica*, for example, Aristides Quintilianus suggests that there are masculine and feminine musical elements, and these elements have qualities associated with their sex.
[113] Elizabeth Castelli (1988) "Response to 'Sex Education in Gnostic Schools' by Richard Smith," p.363 in *Images of the Feminine in Gnosticism*. Philadelphia: Fortress Press.
[114] Cf. Aristotle, *GA* 757.
[115] Other animals, however, might have wombs with more chambers.
[116] *UP* 14.4. Cf. Aristotle, *GA* 765a and the Hippocratic *Aphorisms* 5.48.

opposed to forty-two, as we see in the Hippocratic *Nature of the Child* (18.21). In a similar vein to this text, Valentinian, a second century Christian heretic writing in the Galenic tradition, notes that fetuses on the left, in addition to being warmer, are material (*hylikon*), while those on the right side are psychic (*psychikon*), meaning that they can transmit psychic material.[117] As for sexual aberrations, Galen explains that hermaphrodites belong to an intermediate sex. Since there can arise varying degrees of dominance between the male and female seed, and since these can appear in myriad positions within the womb, the fetus can be entirely male, entirely female, or intermediate. The Galenic view allows for a sexual continuum, although anything which is not entirely male is sub-standard.

This picture differs from the Aristotelian idea of conception, which takes an entirely heat-centered view of sexual difference. Aristotle characterizes hermaphrodites as a type of twin. In his scheme, the mother, although she does not supply generative pneuma, does supply the raw material from which the embryo is formed. In the case of complete twinning, she contributes enough matter to form two entire embryos. But in the case of hermaphrodites, she supplies more than enough material for one embryo, but not enough for two. The surplus material, then, becomes an extra genital. Nonetheless, Aristotle did not believe that genitalia defined the sex of the baby. Rather, it was the amount of heat present in the heart — males having more heat; and females, less. So whatever their anatomy, hermaphrodites truly belonged to one sex or the other. Of course, this heat view of sexual difference invites several questions. Is there some

[117] As an interesting pendant, it is worth noting that the Greek word for soul, *psyche*, is feminine and is often anthropomorphized as a woman. Indeed, in an unusual work of contested provenance, *The Exegesis on the Soul*, the soul is described as a woman who has inverted her womb to be like a male sex organ. So to be something that can actually procreate, the soul must transform herself into a masculine form.

specific temperature which marks the boundary between male and female? And if genitalia are not indicative of sex, how does a hermaphrodite's thermal level manifest itself? In other words, how can he know to which sex he belongs? Allowing for intermediates allows Galen to escape these worries.

But returning to his discussion of sexual differentiation, following conception, we encounter the genesis of the embryo, a process which is also dependent on the sexual interplay of the parents' seed. Galen explains that living beings experience three major events during gestation: genesis, growth, and nutrition. Genesis is further subdivided into the processes of (1) alteration and (2) formation. The first of these processes takes unformed raw material in the womb and creates the embryo's bones, nerves, veins, and other tissue. The subsequent process of formation takes these altered substances and gives them their shape and general organization. Galen describes formation as an artistic act, bestowing the final creative touches on the organs. This is not to say that formation occurs willy-nilly, however; all of its creations are done for some purpose. In this way, no bodily part is superfluous; and none is capable of being better employed. The whole system is teleologically driven.[118] And it is not surprising, then, that only the male's perfect seed is able to perform the task, a point I shall turn to next when I discuss the possibility of female auto-insemination.

[118] Galen's strong teleological bent here seems to sit uneasily with his notion of intermediate sexes. In a scheme where being male and (exclusively) psychically donative is the desideratum, what is the use of being a hermaphrodite? Women are a rung below men, but they can still reproduce. How can the possession of extra but useless genitalia be for the best? Perhaps we can save Galen's teleology by noting that, in several ancient accounts, hermaphroditism seems to have been tied to the possession of unusual powers. Tiresias, for instance, was prophetic. And in the Gnostic tradition, Sophia embodied wisdom beyond expected human bounds. Among non-human animals, the hyena was considered to bear both male and female genitalia (*HA* 579b15-30, *GA* 757a2-13). And somehow concomitant with this unusual anatomy, the hyena had the ability to imitate human speech and to mimic (uncannily) the behavior of its prey. Though reproductively sterile, these hermaphrodites posses non-human — even super-human — capacities. But whether Galen himself subscribed to these beliefs, however, is unclear.

Like Rufus before him, Galen, in his treatise *On the Usefulness of the Parts of the Body*, makes the curious remark that men and women have the same sexual organs; it is just that men have theirs on the outside, and women have theirs internally. And also similar to Rufus, we find the argument that both men and women have "testicles." In Galen, this difference is a function of heat: females are colder and, therefore, imperfect, so their organs cannot grow out. The woman is, in effect, a deformed (*anaperon*) male.[119] Nonetheless, women possess an additional and unique reproductive organ, a womb in which the fetus can develop. So in this view, women are not simply inverted men; they are seed producers *and* receivers. This fact makes women vaguely hermaphroditic and prompts one to ask the attendant question: What keeps women from auto-inseminating? And further, would not their internal genitalia make conception occur even faster than male/female intercourse?

This notion of women as quasi-hermaphrodites finds support in the Hippocratic treatise *On Regimen* (1.28-9). In that work, the author explains that males and females can each produce male and female seed, and the intermixing of these seeds allows for a sexual continuum, ranging from males to females and androgynes. The scheme is as follows: If the seed from both parents is male, the baby will be a robust male. This is the most favorable outcome. If the father donates a male seed and the mother a female seed, the child will be male, but not as vigorous as the child born from two male seeds. If the seed from both parents is female, the child will be female and fair. However, if the father gives a female seed and the mother a male seed, the child will either be a weaker female or a hermaphrodite. So both females and hermaphrodites can result from the same combination of seed.

[119] *UP* 14.7.

But returning to the question of female auto-impregnation, Galen, at least, ultimately concludes that it is impossible. For a woman's semen is weak and cannot confer artistic form (*morphe technike*) on the fetus.[120] Along these same lines, Valentinian, comments that female semen is insubstantial, formless, and imperfect. Simply put, a woman's seed cannot conceive by itself. To be sure, many ancient thinkers did believe that hens could conceive without males, being impregnated by the wind.[121] However, their "wind-eggs" were imperfect and could not hatch. Nonetheless, in parallel to the case of wind-eggs, Galen toys with the idea of women producing dummy fetuses. For he notes that women can conceive lumps of unformed flesh (*sarx adiaplastos*), formations which he labels "moles" (*UP* 14.7). The idea of dummy fetuses is common in other biological treatises. Aristotle, for instance, talks of women who think they have conceived without men, but ultimately produce amorphous, lifeless masses. In his view, the woman's work cannot be brought to perfection because of a weakness of heat (*GA* 775b25-776a10). Likewise, in the Hippocratic *Diseases of Women*, the mole arises from a "little and sickly seed" (1.71) and is not a true fetus. Soranus, too, explains that the mole has just the appearance of pregnancy (3.37). It is unclear what physical anomaly, if any, these authors are describing— perhaps some sort of uterine growth or cyst, but in any event, female auto-insemination is not a viable means of producing offspring.

So while it might appear from Galen's discussion of seed location within the womb that there is a smooth distribution of sexual possibilities, there really is a sharp divide between males and non-males, and the gradation is in degree of deformity (of non-maleness). As for the woman's place in this continuum, she is like a man, in the sense

[120] Galen, *De Semine* 1.7.
[121]This is in analogy to plants which are pollinated via the air. See Conway Zirkle (1936) "Animals Impregnated by the Wind" *Isis*, Vol. 25, No. 1: pp. 95-130.

that she possesses his organs, albeit inverted, and can reproduce. However, she is also like the monsters and other reproductive anomalies because she cannot put her male organs to their proper use. Hermaphrodites are similarly incapacitated. And miscarried fetuses are clearly in the lowest rank of all, as they can no longer perform any vital function.

But returning to Rufus, we can see that his account is not nearly as fleshed out. While he notes that women and eunuchs are imperfectly formed men, he provides no explanation of why this might be the case. It is only with reference to other medical texts that we can coax out an answer. Yet despite viewing women as imperfect, Rufus does not shy away from describing their anatomy. The reason for this seems to be one of practical necessity. Women represent a number of Rufus' patients. He needs a vocabulary to account for their conditions and symptoms. And beyond that, it is patently not the case that Rufus considers women to be inhuman; it is just that they are *imperfectly* human.

Rufus' Slave

Even though Rufus does have access to a male model to demonstrate the external parts, he is, nonetheless, limited by the type of male body he can display. In *Onom.*9, Rufus tells his audience that he is using a slave. It is curious that Rufus announces this fact, as his context should have made his choice of model obvious. Nonetheless, it is worth delving into the slave's identity. Who is this individual that Rufus has on display? He seems a willing enough participant. At any rate, he does not appear to fight Rufus' demonstrations. But whether there was a trussing system holding him in place is unclear. However, it is apparent that the slave was naked; Rufus points to his observable body

parts, and these would otherwise have been hidden by clothing.[122] He must have been young and in good physical condition; and he had to be lean enough to have visible musculature.

Of course, Rufus' use of a slave begs the question: Were the bodies of slaves and freemen viewed differently? It should be noted that the difference between their bodies was not necessarily one of skin color, as slaves often came from the Balkans, Turkey, and Greece, so there might not have been an obvious physical difference.[123] However, it seems that for Rufus, the body of the slave could be used differently from that of a free man. We can also see glimmers of this mindset stemming back to the Aristotelian corpus. In his *Politics,* Aristotle lists three distinct moral levels for humans: (1) males, (2) females, and (3) slaves. Freemen, unlike slaves, women, and children, have the capacity to deliberate (*to bouleutikon*). And by extension, they also have the moral responsibility to control the lives of others who are unable to do so for themselves. According to Aristotle, males have a natural superiority over females. Biologically, women only provide the matter for the seed to grow. And rationally, they do not have the same power as men. Slaves, on the other hand, lack all deliberative power.

> ἄλλον γὰρ τρόπον τὸ ἐλεύθερον τοῦ δούλου ἄρχει καὶ τὸ ἄρρεν τοῦ θήλεος καὶ ἀνὴρ παιδός, καὶ πᾶσιν ἐνυπάρχει μὲν τὰ μόρια τῆς ψυχῆς, ἀλλ' ἐνυπάρχει διαφερόντως. ὁ μὲν γὰρ δοῦλος ὅλως οὐκ ἔχει τὸ βουλευτικόν, τὸ δὲ θῆλυ ἔχει μέν, ἀλλ' ἄκυρον, ὁ δὲ παῖς ἔχει μέν, ἀλλ' ἀτελές.
>
> The freeman rules over the slave after another manner from that in which the male rules over the female, or the man over the child; although the parts of the soul are

[122] However, it is worth noting that even if the slave had been clothed, there was no form of dress specific to slaves. Seneca says that the idea of dressing slaves uniquely had been proposed to the Senate but was dropped for fear that the slaves might realize how numerous they were (*On Mercy* I.23.2).
[123] The origins of slaves spread in tandem with Roman imperialism, so slaves came from Italy, the Iberian peninsula, Gaul, the Balkans, and Anatolia. See Scheidel (2011), 303. Rufus' slave is unnamed, but had he been named, this information is unlikely to have suggested his provenance.

> present in all of them, they are present in different degrees. For the slave has no deliberative ability at all; the woman has, but it is without authority; and the child has, but it is immature. (*Pol.*1260a9-16)

It would appear, then, that here are many similarities between women and slaves -- most notable is the fact that without both, the polis could not exist (*Pol.*1278a22). Aristotle explains that both slaves and women, by nature, should perform activities within the household, so that men can perform their duties outside of the household. Women are meant to bear children and to be companions to their husbands (*Pol.*1277b25). And slaves are designed to do manual labor for others (*Pol.*1287a12, 1254b25). Nonetheless, the relationship between (free) males and females is more equal than that between males and slaves. While the woman is "inferior," the slave is "wholly worthless."[124] Bar On explains that the free male rules over the female for her sake, while he rules over the slave for his own.[125] Of course, there are female slaves as well (*Pol.*1252b1-7), but in terms of the slave's function, sex does not matter.

Rufus' approach appears similar to Aristotle's, and in his work, the slave was a tool, a prop, just like his monkey. That being said, as a crucial difference from his account of the monkey, Rufus still viewed the slave as a person; he was just a person with fewer rights. The circumstances of lecture, especially the slave's anonymity, indicate that he was viewed simply as a body. Indeed, slaves were bought and sold naked, and legal protection of their bodies was light. While Athenian comedy likely exaggerates the level of violence against slaves, philosophical texts perhaps minimizes the damage against them. Rufus' text is silent on this point, and he never actually interacts with the slave in any

[124] Bar On (1994), 102. See Arist.*NE.*1454a20.
[125] Ibid, 102. *Pol.*1252b1-7.

meaningful way. But in any event, it is apparent that Rufus' slave serves a deictic function within the context of the lecture.

As for the question about why Rufus uses a slave instead of a free man, the answer is similar to that of the monkey: It was the best available option for him. It goes without saying that in order to showcase the anatomy he wants to explain, Rufus needs a nude body. Yet he is faced with certain cultural restrictions. Though he considers the body in its ideal state to be male, Greek, uncircumcised, and bearded (but otherwise free of body hair), these requirements cannot be met. As I shall explain, Rufus cannot use a Greek male, as this sort of nudity was only allowed in certain settings, like athletics. And putting aside the question of whether Rufus would have wanted to give extensive treatment to the female body, the reality is that regardless of his preferences, a female model, except perhaps a prostitute, would not have been available to him. Among Greek men of the classical period, there was a fear of female genitalia, particularly pubic hair. This taboo against female nudity extended into the realms of literature, art, and life.[126]

To be sure, in the Archaic period, the female nude was sometimes depicted as a fertility symbol, and later, her image was occasionally used for courtesans. In classical art, especially Attic vase painting, naked women were generally prostitutes. But outside of the artistic realm, women were generally protected from men's eyes. They did not attend symposia, nor did they undress publicly. There is, of course, an exception for Spartan women, who danced naked in some religious rites.[127] And sometimes women would appear naked in mythological scenes in Greek art, particularly chase scenes. The other exceptions are Greek *hetairai* who were shown naked or partially naked. But then

[126] Miller, S. (2004), 150.
[127] Plut. *Vit.Lyc.*14.

again, *hetairai* were not considered full citizens. For Rufus, then, a female nude was something that was not available to him.

As for male nudity, other restrictions apply. As a general comment, nudity marked a contrast between humans and animals, between Greek and non-Greek, and between male and female. Along these lines, Larissa Bonfante in her article "Nudity as a Costume in Classical Art" explores public nudity as a sort of costume.[128] She notes that during the classical period, the Greeks saw athletic male nudity as something that distinguished them from barbarians. Herodotus and Thucydides, for instance, saw athletic nudity as a custom which separated the Greeks. In his well-known story of Gyges (1.10.3), Herodotus explains that "among the Lydians, as just among all the other barbarians, even for a man to be seen naked brings great shame.[129]

Yet outside of artwork and athletics, Greek nudity was something that was not showcased. Indeed, the Greek word *aidoia*, "shameful things" was used for sexual organs. And Rouelle preserves this sense in his French translation. In *Onom.*101 male sexual organs are "*organs génitaux*," while female organs in *Onom.*109 are "*parties honteuses*." But even beyond the Greek world, the body taboo was widespread.[130] In the *Old Testament*, for instance, nudity signifies shame, slavery, and humiliation. And in the ancient Near East, it is an indication of defeat, as prisoners were bound and naked.[131] As mentioned, the only real exception to this taboo was athletics; there was a change in the Greek tradition during the classical period, and nudity represented athleticism and

[128] Binfante (1989), 543-70.
[129] Cf Thuc.1.5-6.
[130] H.C. Warren "Social Nudity and the Body Taboo," *Psychological Review* 40 (1933), 160-83.
[131] *Wörterbuch biblischer Bilder und Symbole* (Munich 1973) 218-20, s.v. Nacktheit (N. Lurker).

readiness to fight. But Rufus did not have a male athlete available to him, so he had to work within his limitations.

Rufus' Third Requirement: A Living Model

And the final part of Rufus' answer to the question "what is human?" is "a body that is alive." Rufus recognizes that beyond being a collection of parts, the human body is something that moves, that exists in time, and that undergoes physiological processes. So one of the biggest hindrances for him when discussing both the internal parts and their respective functions is that he only has access to a cadaver. And again, Rufus must use a cadaver because vivisection was not a viable option for him. Like dissection -- but even more so -- it had become taboo.

It is worth noting that there are always attendant problems and limitations when using cadavers for anatomical investigations. In the first place, the investigator needs a range of ethnicities, ages, sexes, and pathologies. In other words, the sample set needs to be large enough to make generalizations appropriate. Rufus never speaks of his models in the plural. He does not appear to have multiple cadavers or jars of preserved specimens. Nor is it clear that Rufus' venue would have supported a large collection of bodies. Incidentally, these limitations are why we now have computer models and simulations; medical students can more easily be exposed to age- and sex-specific anomalies. But beyond this, dissection of cadavers assumes not only that there exists a relation between structure and function, but also that symptoms of diseases have anatomical correlates which remain visible after death. A final problem worth mentioning is that if the individual under inspection has died, bleeding from cuts will be minimal. In a dead body,

the only blood pressure will be from the pull of gravity. So the workings of the circulatory system will not be manifest.

In any case, since Rufus does not have access to a living body -- human or otherwise --, he must use one that is dead. Nonetheless, he proceeds through his discussion as if the monkey were alive, describing its physiological processes as if they were *currently* happening. The heart and arteries lying before him pulsate; the bladder secretes urine; the lungs inflate; muscles contract; and joints bend. It appears that Rufus has a fully functioning body in front of him.

Of course, when using preserved organs as a launching point for physiological discourse, description necessarily bleeds into narrative, as living bodies exist in time. Static organs become part of a sequential series of (physiological) events, often with no clear signal to the reader where this transition occurs. Rufus typically proceeds by noting some striking feature of his model which he can then situate in a physiological story. In this way, there is a mutually enhancing process of seeing and imagining. Rufus' readers never actually see the models he describes, and we who get the descriptions second-hand must imaginatively generate not only any extra-visual responses, but also the images themselves.

As a point of comparison, Rufus' account is similar to Philostratus' *Imagines*, wherein the author gives his nephew a tour through an art gallery. In that work, Philostratus points to paintings and describes their parts. Yet it quickly becomes clear that there is something odd about these paintings. Far from being two-dimensional, static images that can appeal only to the eye, Philostratus' paintings involve motion, produce sounds and smells, and are not temporally fixed. Indeed, the paintings are simply

launching points for Philostratus' narrative, vehicles for him to say what he wants. In a similar way, I would argue that Rufus' models are also narrative starting points, and his story goes far beyond the bodies in front of him. As I have argued, the fiction inherent in Rufus' account manifests itself in several ways: (1) a male provides evidence for female anatomy, (2) a monkey provides evidence for human anatomy, and (3) a cadaver provides evidence for living bodies. So despite his use of "real life" props, Rufus seems more literary than we might expect. While his descriptions are not exactly ecphrastic, there is something similarly fictional in his presentation. The inherent limitations of his props are not limitations for his narrative. And in working around his tools, which he deems unsuitable to various extents, Rufus can demonstrate what for him is uniquely human.

Chapter 3

Rufus as a Grammarian

As a compiler of medical terminology, Rufus has two subsidiary goals: (1) identifying the parts of the body and (2) providing names for these parts. Rufus views this second task as a complex one. How can we best identify the features that comprise humans? What dialect do we use? What register? What sorts of metaphors are helpful? Whose terminology should we trust? Or is it better to coin new terms? As is the case when identifying the parts of the body, Rufus faces certain limitations when describing them with words. Not all parts have previously received names. And some have names provided by physicians whom Rufus does not like. In this section, I shall argue that in wrestling with language, Rufus displays many of the same prejudices that manifested themselves in his description of the human body. It is clear, for instance, that Rufus privileges certain words: He approves of the coinage of Athenians but criticizes the language of foreign doctors who, to his mind, spoke Greek badly. Those who are trustworthy are those who are like him.

I shall also argue that Rufus' focus on the exceptionalism of the human body also comes to the fore in his abundant use of metaphors. When Rufus does not have a ready term to describe a part, he will often recycle one for another part. In other words, the human form is so foundational that Rufus will often explain the human body in terms of the human body. Certain words, in particular, become basic: the head, neck, and

extremities reappear throughout the treatise. These are the same words that Rufus identifies in his preface as most important. But more than that, it is not just the human body that Rufus privileges, but it is also human behavior. Rufus' metaphors reach to human diet and even to human cultural and intellectual pursuits.

The Foundational Importance of Names

From the outset of his preface in the *Onom.,* Rufus tells his audience that arriving at the proper name for something is critical in all benausic pursuits:

> Τί πρῶτον ἔμαθες ἐν κιθαριστικῇ; Κρούειν ἑκάστην τῶν χορδῶν καὶ ὀνομάζειν. Τί δὲ πρῶτον ἔμαθες ἐν γραμματικῇ; Γνωρίζειν ἕκαστον τῶν γραμμάτων καὶ ὀνομάζειν. Οὐκοῦν καὶ τὰς ἄλλας τέχνας ὡσαύτως ἀπὸ τῶν ὀνομάτων ἄρχονται διδάσκειν, καὶ ὁ χαλκεὺς, καὶ ὁ σκυτοτόμος, καὶ ὁ τέκτων, πρῶτον καὶ σιδήρου ὄνομα, καὶ σκεύους, καὶ οὐτινοσοῦν ἄλλου τῶν πρὸς τὴν τέχνην. Καὶ ὅσαι σεμνότεραι, οὐχὶ καὶ ταύτας ἀπὸ τῶν ὀνομάτων ὡσαύτως ἄρχονται διδάσκειν; Τί γὰρ πρῶτον ἔμαθες ἐν γεωμετρίᾳ; Στιγμὴν, καὶ γραμμὴν, καὶ ἐπίπεδον, καὶ ἐπιφάνειαν, καὶ σχῆμα τρίγωνον, καὶ κύκλον, καὶ τὰ ὅμοια, εἰδέναι τε ὅ τι ἕκαστον αὐτῶν, καὶ ὀνομάζειν ὀρθῶς.
>
> [1-5] First of all, what do you learn to practice cithara playing? Being able to touch and name each one of the chords. And what should you know to practice grammar? Discerning each of the letters and naming them. The same is also true for the other arts, for which we begin to learn the names: the metalworker, the leather-cutter, and the carpenter. First one learns the names of iron and carrying-pails and all of the other objects used for that craft. And what about the other more serious skills? Do they not begin with the discovery of the names of things? What does one learn first in geometry? Knowing and correctly naming the point, the line, the plane, the surface, the shape of a triangle, the circle, and other similar things.

Pinning down the proper terms is a necessary first step. This tendency is, however, not unique to Rufus. Indeed, it is a commonplace in philosophical texts that investigations should start with the terms being used. Epictetus (*Diss.*I.xvii.12) attributes this idea to Antisthenes and Socrates. Rufus is not alone among the later medical authors to endorse this idea. Galen, in particular, emphasizes the importance of terminology, and though he

wrote later than Rufus, it is useful to turn to his account so as to flesh out Rufus'. Galen later suggests that all philosophico-medical training should begin with a reading of his (lost) treatise *On the Correctness of Names* (*Ord.Lib.Prop.*XIX.61). But beyond that, he says this work was written *because* of those who use words badly (*Ord.Lib.Prop.*XIX.61).[132] The charges against these individuals are numerous: they are unclear and ambiguous; they invent words when good ones already exist; they find differences in meaning between words when none exist; and they use old Attic words, use metaphors in inappropriate contexts.

The correctness of names is the main topic of Plato's *Cratylus*, and it is a text lurking in the background of many of these rhetorical discussions. In the work, Plato distinguishes two principle questions: (1) Is a name itself fitting? and (2) is the name correctly applied? Socrates responds to Hermogenes' challenge that no one is able to suggest that the correctness of names is determined by anything other than convention (*Crat.*384c10-d2).

A name is, therefore, inappropriate if it does not reflect the nature of the object named.More specifically, in discussing the process of naming, Socrates says that if the name-maker could imitate the essential nature of things with letters and syllables, he would show what the thing *really is*. But in 424D, it is urged that we must know how to apply each letter with reference to its fitness (*kata ten homoioteta*), whether one letter is in question or many. Just as with painting, in making an imitation, sometimes one needs one color, sometimes a mixture, as the picture requires. However, names can never be *like anything* unless those elements from which the names are composed exist in the first place and possess a likeness to the things which the names imitate (434B). Nonetheless,

[132] Cf. the title of *Against those who Interpret Words Abusively* (*Lib.Prop.*XIX.44).

all agree on the importance of names for teaching. Socrates claims that names are the instruments by which we teach one another (388b), while Cratylus explains that names themselves are teachers (433d, 438a).

In a similar discussion, in *Theaetetus* 202A, Socrates relates that he used to imagine certain people saying that primary elements admit of no rational explanation and can only be named. For any sort of qualification would add to its existence or non-existence. In 202B, he explains that complex things, on the other hand, are composed of discrete elements. And a combination of names is tantamount to the essence of reasoning. Elements are not objects of reason, only of perception. But combinations are objects of knowledge.

The central issue in Hellenistic theories of language is whether names are products of imposition (*thesis*) or spontaneous process (*phusis*). As Origen questions:

> πότερον, ὡς οἴεται Ἀριστοτέλης, θέσει εἰσὶ τὰ ὀνόματα ἤ, ὡς νομίζουσιν οἱ ἀπὸ τῆς Στοᾶς, φύσει, μιμουμένων τῶν πρώτων φωνῶν τὰ πράγματα, καθ᾽ ὧν τὰ ὀνόματα, καθὸ καὶ στοιχεῖά τινα τῆς ἐτυμολογίας εἰσάγουσιν, ἤ, ὡς διδάσκει Ἐπίκουρος, ἑτέρως ἢ ὡς οἴονται οἱ ἀπὸ τῆς Στοᾶς, φύσει ἐστὶ τὰ ὀνόματα, ἀπορρηξάντων τῶν πρώτων ἀνθρώπων τινὰς φωνὰς κατὰ τῶν πραγμάτων.
>
> Are names, as Aristotle thinks, the result of imposition (*thesei*)? Or are they rather, as the Stoics believe, the result of nature (*phusei*), claiming that the first sounds imitate the things to which the names belong, on the basis of which they propose some elements of etymology? Or are the names, as Epicurus teaches, a result of nature but in a different way from that of the Stoics, since the first men uttered certain sounds concerning the things? (Origen, *Contra Celsum*.I .24.9-16)

Aristotle suggests that names are purely conventional; they are just symbols, and nothing about names is natural – neither in the sense that names are necessary representations of their objects, not that they are products of nature. In contrast, the Stoics suggest, like Socrates in the *Cratylus*, that names are products of a name-giver, who (fairly accurately) designs names to resemble their objects. Names imitate objects by means of the first

sounds (*protai phonai*) from which they are composed. According to Socrates, for instance, the "l" sound evokes softness.[133] And likewise for the Stoics, the first sound will generate in the hearer the same sensation as perception. *Lana* (wool), with its soft "l" will sound soft like wool.[134] It is not to say that names are always the best way to understand the nature of objects, but it is a good starting point.

The Stoics, in particular, were interested in etymology; Chrysippus likely invented the term (DL 7.200). Stoics took the basis of names to be nature. Accordingly, words were formed at the beginning of human history, though some names are given by nature (*phusis*) and others by convention (*thesis*). According to the Augustan *De Dialectica* (10.1-3), the first words were onomatopoetic, and these primary words were later transferred to items that resembled them (10.10-13). Similarly, Lucretius 5.1041 notes that the first words were the result of spontaneous vocalization.

Following on this tradition is Augustine's *De Dialectica* 6, which was probably based on Varro's lost works on grammar. In this work, Augustine argues that the origin of words is based on three things: (1) onomatopoetic similarity (*similitudo*), (2) proximity (*vicinitas*), and (3) opposition (*contrarium*).

In the medical realm, for example, Galen says that the "carotid" artery was named because it is supposed to induce stupor if cut (*PHP*.5.263), but it, in fact, does not. The good of language, Galen tells us, echoing Socrates, is its didactic function. However, in medicine, many names were not coined by experts, but rather by misinformed doctors. And these inapt names stuck. Galen cites the case of the word "*asplanchnos,*" literally "without internal organs." But it was also used by non-medical writers to describe those

[133] *Crat.* 434c4-5.
[134] Varro fr. 113, Goetz-Schoell.

who "pity non one" (*PHP*.5.316). However, Galen says that in this case, the word is fitting since the liver is where the desiderative part of the soul lies.

As another illustrative example, Galen notes that the standard word for membrane is "*chiton*" (*UP*.III.290-1). But at *UP*.488, Galen notes that that pericardium is not really a *chiton* since tunics are always in contact with that which they surround. Yet the pericardium only touches the heart when the organ is in its expanded state. Nonetheless, Galen still uses the term in *AA*.II.595. Since for him, finding the correct word is less important than understanding the medical function of an object. It is essential for anyone who wants to discover the truth in these matters to try to rid himself of all additional beliefs that arise as a result of the names, and to go straight for the actual substance of things (*MM*.X.44).[135]

Another example involves the word "*apepsia*," which is used to describe both bad digestion and no digestion. Galen suggests that it is better to use the word "*duspepsia*" to describe the former condition, especially if it necessitates a different type of treatment (*Supp.Diff.*VII.46). In addition, Galen criticizes Aristotle's use of the word "brain." For animals with no head, Aristotle call the organ "something analogous to the brain," which is to imply that the brain, writ proper, is only to be found in the head.[136]

As for the role of words in teaching, Galen tells us that Words are of little help at all to us in gaining knowledge of things, but only in teaching. And if someone gave no names to things yet was still able to know about those things and to understand what conditions they suggested, he would seem no less able to do this than those who gave

[135] Trans. Morison (2008), 132.
[136] "The *enkephalos* has above all got its name from its position. It has been named in this way because it lies in the head. But because in the case of those animals which do not have a head, we find it in the chest area, we shall not say that in these cases it is something else and merely analogous to the *enkephalos*, but rather we shall say that it is itself and *enkaphalos*, and that the old word does not become it." (*UP*.III.626)

things names. (*Diff.Puls.*VIII.496). Since instruction necessitates the use of a common language, it is best to use Attic Greek (*Thras.*V.868-9). However, one could easily use a foreign language, if others were to follow suit:

> εἰ μὲν οὖν ἅπαντες συνθέμενοι μίαν διάλεκτον ὥσπερ νόμισμα καινὸν ὑπὸ ψηφίσματος εἰσηγήσαντο, τάχα ἂν ἐπειράθημεν ἐπιλαθέσθαι μὲν τῆς τῶν Ἑλλήνων, ἐκμαθεῖν δὲ τὴν πρὸς ἐκείνων νομοθετηθεῖσαν.
>
> If everyone were to agree to use one language, as if it were new currency, then perhaps by order, we could try to forget the language of the Greeks and learn the one established by these people (*Diff.Puls.*VIII.567-8).

When many words mean the same thing, Galen explains that we can use all without discrimination, since no difference is implied (*Symp.Diff.*VII.108).

Nomenclature in Rufus' Texts

As noted in the introductory information, Rufus' *Onom.* and *Anat.* are, generally, in agreement in their use of anatomical terminology. Turning to specifics, in *Onom.* 141.5 explains that "*staphule"* is limited to inflammation of the uvula, while *Anat* 173.8 explains that the word is used for the uvula itself. *Anat.* 181.8 and *Onom.* 1146.12 use different terms for the ureters. *"Neuron"* (11.16, 481, and 502) is used variously for ligaments, tendons, and other sinews. Likewise, various terms are used for vessels: *phlebes, angeion, ochetos,* and *poros.* Aelion tells us that *tenthreniodes* was used by Democritus in a fragmentary work *Anatomy* (L VIII 538.6) to describe "honey-comb" lungs. *Onom.*159.13-160.5 quotes a passage from the lost work *Cnidian Sentences*, where the word *"alopekes"* (foxes) was used to describe the lumbar muscles.

But generally speaking, how does Rufus suggest one go about the process of anatomical naming? One can name a part from its prominent features -- the duodenum,

for instance is so-called because it appears to possess twelve fingers.[137] Alternatively, parts can named from taking pre-existing terms and adding a prefix. As an example, we have *metakarpion* (the after-wrist)[138] and *hyposphondulon* (the lower vertebra).[139] Another option for naming is to draw an analogy between one body part and another or between a body part and some object. Taking first the comparison of two body parts, Herophilus explains the *chorioeides* is "after-birth like" And the term "*amphiblestroeides"* (net-like) is used for the retina.[140]

Of course, numerous difficulties attend the process of naming. In the first place, alternative names might be used for the same part, a phenomenon we see frequently in Rufus' texts. *Pareiai* (side of the face), for example are also called *siagones* and *gnathoi.* And in the same way, there are three names for the uvula: *kion, gargareon,* and Aristotles *staphulophoron* (*Onom.*141.3) And further, there are two words for the palate: *ouranos* and *hyperoa* (*Onom.*141.3); two for the sacrum: *hieron ostoun* and *hyposphondulon* (*Onom.*148.1); two for the spinal marrow: *muelos notiaios* and *rachites* (*Onom.*153.13); and three for the bronchia: *bronchiai, seranges,* and *aortai* (*Onom.*155.10)

An allied difficulty is that one term is often used to describe multiple parts. "*Thorax"* describes both the area between the clavicle and hypochondria *and* the entire area between the clavicle and genitalia (*Onom.*135.2). *"Omos"* means both the head of the humerus and the whole limb to which it is attached (*Onom.*142.8). *"Xeir"* is both the hand and the entire arm (*Onom.149.2*) *"Sarx"* suggests variously: the area between organs, the flesh of the muscles, and coagulated material found in in healing wounds

[137] Galen.*On Dissection of Veins and Arteries.*1.K.II.780.13, *On Parts Affected* VI.3.K.VIII.396.6.
[138] *Onom.*144.1 and Galen *On Bones for Beginners* 19.K.II.771.7.
[139] *Onom.*156.4.
[140] *Onom.* 154.9 and Celsus *De Medicina* III.7.13b.

(*Onom.*164.5). And sometimes *"stomachos"* is used for the esophagus, the neck of the bladder, the neck of the womb, and the vagina (*Onom.* 155.7 and *Anat.* 174.10).

Metaphors in Rufus' Texts

When faced with an as yet unnamed body part, Rufus has a marked tendency to turn to metaphors and analogies. As I shall describe, these metaphors reach into various aspects of human behavior and culture, including diet, art, and technical skills. Though Rufus' rococo use of metaphors is a distinguishing mark of his anatomical texts, as a general statement, analogies were used from the beginning of Greek science, but especially during the fourth and fifth centuries. Anaxagoras, as an early example, explained that certain phenomena should be used to explain what is unseen.
These metaphors, in many ways, allowed scientists to sidestep difficulties with naming, as objects could be noted based on their similarity to other objects. To delve more deeply into Rufus' typology of metaphors, it would be useful, in the first place, to note which metaphors are most prominent in his works. In the *Anatomy*, food metaphors are common. The second membrane of the eye looks like a cluster of grapes; the third membrane of the eye is like the white of an eye; the uvula is like a bunch of grapes; the color of the liver is like lentils; the color of the spleen, like wine; the kidney, also like lentils; and the testicles, like porridge in texture.

Other types of metaphors in this work are geographical ones: the glands of the tongue are like isthmuses; linguistic: the colon looks like the letter *pi*; geometrical: the heart is shaped like a cone; instrumental: the esophagus is like a trumpet, the scrotum like a spear-case, the uterus like a cupping instrument; functional: the pylorus is like a gate

keeper; and anatomical: the gallbladder resembles the bladder, the spleen looks like a footprint, and the duodenum like twelve fingers. What these metaphors have in common is their link to human culture and biology. In many ways, this goes without saying: We liken unfamiliar objects to those we know. And we are especially familiar with our own bodies and habits.

Turning to Rufus' *Onom.*, the use of metaphors is just as extensive in that work. Again we find food metaphors: nails are like grapes, for instance. But what is especially notable in this work is Rufus' use of body parts to describe other body parts. Several organs and limbs, for instance, are described as having heads: arms (the shoulders), testicles, the larynx, the heart, and the spleen. These metaphors are directional in nature; the "head" is always the top of the body part in question. Similarly, the bladder, liver, and uterus have "necks," connecting structures leading from the "head." The uterus also has "shoulders," the belly has a "mouth," the brain has a "belly," and the heart has "ears" (auricles) flapping at its sides.

It should be reiterated that these are the central body parts that Rufus highlights at the start of his *Onom.* Certain body parts of simply more defining humans, like the head. However, it is worth noting that the head could mean multiple things and could be interpreted in multiple ways -- the top of something or the sensory portion of something, for instance. But Rufus tends to pick out the orientational element. And, of course, tied to this is the expectation that his readers/listeners will turn first to the orientational/spatial option as well.

But there are many options for orientation too. Rufus tends to use "head" to describe the top of something, but he could just as easily have used "crown." Likewise,

"shoulders" and "ears" are used to describe the sides of things, but "flanks" would have been equally applicable. Rufus seems to pick out the most readily observable parts, and for the most part, he sticks with them throughout.

Comparanda: Metaphors in the Hippocratic Corpus

As Lloyd notes, in the Hippocratic corpus, there are many examples of analogies in anatomy, physiology, and embryology. The Hippocratic authors, like the Presocratic philosophers, tried to explain new phenomena by comparing them to familiar objects which could be seen directly. In the work *On Breaths*, for example, the author compares steam coming off cauldrons of boiling water and what causes a patient to yawn at the start of fever. When water starts to boil, steam is driven off, and similarly, in a body, when the temperature rises, air is forced through the mouth. The same process occurs with sweating (8.96.15).

Similarly, in *On the Nature of the Child* L.VII.488.13, the author describes the formation of the membrane around the seed as being like the crust that forms on cooking bread. Both happen when the seed and bread are heated and "distended by air." And in *On Diseases* IV.LVII.584.15, the author tells us that when the body is heated, the humors separate like churning butter, with bile on the top, then blood, then phlegm, then water. But when the body cools, the effect is more like adding fig juice to milk (590).

Hippocratic comparisons to plants are just as numerous. In *On Diseases* IV.LVII.544.17, the stomach is described as drawing in nutrients like plants' roots taking in food from the soil. In *On the Seven Month Child* L.VIII.436.8, the fetus ruptures its surrounding membrane like ripe ears of corn. And in *On the Eighth Month Child*

LVII.458.2, the umbilical chord is likened to the stalk of fruit. In *On Generation* LVII.482.14, the size and shape of an embryo is determined by the womb in a way similar to plants grown in different containers. And in *On the Nature of the Child* LVII.498.3, the growth of human limbs is like the branches of trees. The author of *On Ancient Medicine* recommends the use of analogy in medicine. As a general statement, Hippocratic authors use *hosper* or *hos* followed by *houto kai* or *houto de* in their metaphors.[141]

But there are, of course, possible problems with the extensive use of metaphors and analogies. In the first place, one runs the risk of neglecting obvious points of difference between the objects being compared. Illustrations can also be obscure, rendering useless the explanatory potential of metaphors. And beyond that, one can easily be misled by superficial similarities, establishing shaky comparisons. Analogy can always be mistaken for demonstration. And there is the temptation to ignore differences between objects compared.

Metaphors abound in Plato's and Aristotle's works. In *Tim.*78b, Plato's account of respiration is modeled on a fish-trap, since it is a woven object with a funnel at its entrance. And in the same work, Plato explains that the world is a living creature with a soul.[142] Aristotle, in *Organon and Rhetoric*, criticizes the use of metaphors and analogies, comparing them with syllogisms. Yet he uses metaphors in several of his other works, nonetheless, especially ones between terrestrial and physiological events. Earthquakes are like bodily spasms.[143] Aristotle also picks up Empodocles' analogy of perspiration being

[141] See, for instance, *Mul.*LVIII.12.17 and *Morb*.IV.39.558.
[142] Plato.*Tim*.31b-34b.
[143] Arist.*Mete.*366b14.

like the sweat of the earth.[144] But, of course, this analogy does not explain why sweat is salty in the first place.

Aristotle makes further comparisons between species. Feathers, for instance, are like the scales of fish, because they serve the same function (*dunamis*).[145] Plant metaphors make an appearance as well: Baldness in humans is like the shedding of leaves; both are due to the loss of warm moisture.[146] And beyond that, Aristotle makes comparisons between parts of the body and objects outside of the body. As an example, testicles are like stones weights attached to a loom, as they serve to keep the seminal passages taut.[147]

Aristotle says that Alcmaeon compares the growth of pubic hair to the flowering of plants before they produce seed.[148] According to Aet.V.16.3.DK.17, Alcmaeon held that the mammalian embryo takes in food through its whole body like a sponge. But Rufus says that Alcmaeon held that the embryo takes in food through its mouth while still in the womb.[149] And Aristotle also says that Alcmaeon promotes the idea that the white of the egg (*to leukon*) is its milk.[150] Similarly, *Diseases* IV.39 compares blood vessels to pipes. Plant metaphors also abound. In *The Seed* 9, the author explains that the size of a growing cucumber is determined by its container, and in the same way, an embryo is shaped by the womb containing it. And in Chapter 10 of the same work, the author explains that both trees and human body parts will become deformed if their growing space is compromised.

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[144] Ibid.356b4.
[145] Arist.*PA*.645b8.
[146] Arist.*GA.783b8.*
[147] Ibid.717a34.
[148] Arist.*HA*.581a14.
[149] Orib.III.156, CMG.VI.2.2.136.28.
[150] Arist.*GA*.752b22.

At the heart of these vitalist notions of the cosmos is the extended metaphor that natural objects are alive and that the origins of things are given in terms of birth and reproduction. Anaximenes was one of the first to compare the world writ large and humans: "Just as our soul, being air, holds is together, so too does wind or air enclose the whole world."[151] And in the Hippocratic corpus, we see in *On Regimen* I.LVI.484.17 that fire is arranged in the body like a copy of the whole. Likewise, the belly is like the sea. In *On Sevens* II, the geographical areas of the earth are likened to parts of the body. The Peloponnese is equated with the head, and the Thracian Bosphorus is like feet.

The particular analogy that man is a microcosm of the universe finds place both in Rufus' corpus and, more generally, in a range of Greek scientific and philosophical texts. This tendency is based on Democritus' principle that "man is a small universe" (*anthropos mikros kosmos*)[152] Noteworthy examples in the Hippocratic corpus include *De victu* 6.462-663, *De Hebdomadibus* 8.616-73, and *De Carnibus* 8.576-83. The first of these cases explains that the body is an imitation (*apomimesis*) of the universe. While *De Carnibus* gives a description of the creation of the universe and suggests that man is composed of the same materials. In a similar way, *De Natura Hominis* invokes "meteorological medicine," making an association between the humors and seasons and suggesting that climatic changes affect physiology (2.3). And we find a similar point in Aristotle *Meteorologica* 1.14.351a26-28:

> ἀρχὴ δὲ τούτων καὶ αἴτιον ὅτι καὶ τῆς γῆς τὰ ἐντός, ὥσπερ τὰ σώματα τῶν φυτῶν καὶ ζώων, ἀκμὴν ἔχει καὶ γῆρας.
>
> But we must imagine that these changes follow some order and cycle. The principle and cause of them is that the interior of the earth has periods of maturity, like the bodies of plants and animals.

[151] Aetius I.3.4, DK 13B2.
[152] DK 68 B 34.

And Book 2 explains that the sea is a kind of sweat exuded by the earth when heated by the sun.[153] Also relevant are Seneca's comments in his *Naturales Quaestiones* 3.15.[154]

The earth has roads for both air and water, and the human body is used as a reference. Similarly Book 6's description of earthquakes explains that we have receptacles for breath (*receptula animae*), and the whole body of the earth (*totum terrarium omnium corpus*) has a similar sort of passage system(6.18.6).[155] But this prominent use of analogical language begs a more general question: Are we hard-wired to think metaphorically? That is, can we not help *but* to use metaphors to describe unknown items? One approach to searching for an answer might be to study a vast array of languages in order to observe the relative importance of metaphor to instruction. It seems likely that metaphor would be found in all of them to some extent, as it is a useful shorthand for describing and explaining objects, acts, and qualities that were previously unfamiliar. For example, when meeting someone outside our circle of acquaintances, our immediate urge is usually to identify that person with qualities belonging to someone within our circle: this gives us a frame of reference for determining how to interact with the person as well as determining how to describe this person to someone else. In the realm of law (at least in those systems influenced by English common law), metaphor is

[153] This is attributed to Empodocles 2.3.357a24-b21. See DK 31A66 and 31B55.

[154] "The idea appeals to me that the earth is governed by nature and is much like the system of our own bodies in which there are both veins, receptacles for blood, and arteries, receptacles for air. In the earth also there are some routes through which water runs, some through which air passes. And nature fashioned these routes so like human bodies that our ancestors called them 'veins' of water." trans. T.H. Corcoran (1929).

[155] "Our bodies also do not tremble except when some cause disturbs the air inside, when it is contracted by fear, grows weak in old age, becomes feeble with sluggish veins, is paralyzed by cold, or is thrown from its normal course under an attack of disease. For, as long as the air flows without damage and proceeds in its usual way, there is no tremor in the body; when something happens which inhibits its function, then it no longer is strong enough to support what it had maintained in its vigor. As it fails it causes to collapse whatever it had sustained when it was intact." trans. Le Blay (2005).

important insofar as judges and lawyers constantly identify present cases with earlier ones (arguing that Person A is like Person B, or Situation A is like Situation B) to search for precedents for handling particular types of situations.

Of course, our language/culture teaches us to privilege some types of metaphors over others. If, for instance, someone were to say that Germany is the heart of Europe, we might understand it functionally (i.e. Germany holds some critical role in European politics) rather than, say, spatially (i.e. Germany is in the upper left quadrant of Europe), though both could be possible. However, we would come to this functional understanding knowing something about German and European history; it might be different for someone without that knowledge. It seems that a metaphor is less important in describing something relatively concrete like location than it would be in describing something more complex like politics or economics, which is perhaps why we gravitate toward the latter. When identifying someone new with someone familiar, we tend to start with appearance (visual and aural) and then use personality traits as a secondary (and in the end, more important) filter.

Chapter 4
Rufus as a Sophist and Lexicographer

For over forty years, scholars have argued that discussion of the Second Sophistic should extend beyond Dio Chrysostom and Philostatus and should reach into the realms of science and medicine. Most notably, Swain, Bowersock, Von Staden, and Gleason have all argued that Galen should be viewed through this lens.[156] There is little doubt that Galen deserves a place in discussions of Hellenism and Classicism, but the question I shall address in this section is whether Rufus does as well. The quick answer seems to be "yes," but only to an extent. There are some obvious visual markers in Rufus' works that set him off as a performer: He asks his audience to look at various body parts, and he uses deictic forms. And the fact that Rufus is carrying out his dissection in front of a live audience underscores its performative elements.

Rufus delivers what can only be called a tidy and efficient show. His preface indicates that he has his readers' and audience's needs in mind; he is trying to win them over with his rehearsed performance. He has good judgment about what material to present (and in what order), and he can sift through a large amount of data. Rufus also evinces a keen interest in linguistic purity, a marker of the Second Sophistic.

But in terms of self-presentation, Rufus veers a bit from the norm. Most sophistic doctors tend to use first person pronouns frequently in their works. They also tend to

[156] See Swain (1996), Bowersock (1969), Von Staden (1995), and Gleason (2009).

adopt a combative tone. While Rufus does use the first person singular pronoun, it is often in the gentler form of "*dokei moi*." And while he notes rival interpretations, he is not aggressively polemical. It is more the case that Rufus mentions alternative views to be as comprehensive as possible, not to be critical. On a spectrum of doctors who are (a) especially flamboyant, and (b) those who keep to themselves, Rufus seems to fall more into the second category. Throughout his works, he seems mild-mannered and less ambitious.

Even more problematic is the fact that Rufus seems to lack any obvious Roman connection. For most classicizing doctors, trying to get imperial patronage goes hand-in-hand with their scholarly activities. As I shall discuss, Rufus is often associated with Statilius Crito, who was served as the imperial physician under Trajan. But again, there is no evidence that Rufus had a similar role. In fact, there is no evidence that Rufus ever went to Rome. I shall argue that Rufus' sophistic reticence was, in part, a function of being an early participant in the sophistic movement. But the fact that he was not an active seeker of imperial patronage suggests either that he was independently wealthy, or for whatever reason, he was content to keep mostly to himself.

That being said, there are plenty of (proto-) sophistic elements in Rufus' corpus, so before detailing them, it would be useful to give some background to the movement. For Philostratus, the Second Sophistic implied performances of epideictic oratory, a mixture of scholarship and theatrics. It was a phenomenon that existed throughout the Greek-speaking areas of the Roman empire during the 1st-3rd centuries CE. Sophistic displays were occasions when the male elite would assemble to hear oratorical declamation, and the performer would attempt to impress his audience with his education.

The common periodization of this upsurge in Hellenism and classicism begins in the reign of Nero. With Hadrian, it takes another turn, and participants up the ante in terms of their display. Rufus, then, is a little early for this, but as I shall discuss, there are glimmers of iatrosophism in physicians predating him, so it is appropriate to question the extent of Rufus' participation.

Of course, we should not expect Rufus' text -- or any medical text -- to fit perfectly into the category of oral performance, as Greek scientific literature takes a variety of forms: poetry (Hesiod, Parmenides, Empedocles, Xenophanes, Nicander, Aratus); letters (Epicurus); dialogues (Plato); speeches, handbooks, compendia, aphorisms, and commentaries. Within the Hippocratic corpus, texts are categorized as *gnomai* (sentences); *logoi* (speeches); *parangeliae* (instructions); *aphorismoi* (aphorisms); *prognosies* (prognoses); *nomos* (law); and *dogma* (decree).[157] Certainly, this range is to be expected in the Hippocratic corpus, which spans more than sixty works and over two hundred years. But we find it too in Aristotle: his corpus contains *akroaseis* (lectures); *problemata* (problems); *epitomai* (epitomes); *diaireseis* (divisions); *epikheiremata* (essays), and *pragmateiai* (treatises).

Many treatises of the Hippocratic corpus refer specifically to oral presentations and set the stage for later, more sophistic displays. *On Ancient Medicine* begins by referring to "all who have attempted to speak or write on medicine and who have assumed for themselves a postulate as a basis for their discussion."[158] *On the Nature of Man* speaks of an audience who "used to listen to people who speak about the nature of

[157] For a summary of the Hippocratic range see Jouanna (1992), 527-63.
[158] *On Ancient Medicine* 1.1 570L.

man beyond what is relevant for medicine."[159] And later in that work, the author even mentions a rhetorical contest:

> Γνοίη δ' ἄν τις τόδε μάλιστα παραγενόμενος αὐτέοισιν ἀντιλέγουσιν· πρὸς γὰρ ἀλλήλους ἀντιλέγοντες οἱ αὐτοὶ ἄνδρες τῶν αὐτέων ἐναντίον ἀκροατέων οὐδέποτε τρὶς ἐφεξῆς ὁ αὐτὸς περιγίνεται ἐν τῷ λόγῳ, ἀλλὰ ποτὲ μὲν οὗτος ἐπικρατέει, ποτὲ δὲ οὗτος, ποτὲ δὲ ᾧ ἂν τύχῃ μάλιστα ἡ γλῶσσα ἐπιῤῥυεῖσα πρὸς τὸν ὄχλον. Καίτοι δίκαιόν ἐστι τὸν φάντα ὀρθῶς γινώσκειν ἀμφὶ τῶν πρηγμάτων παρέχειν αἰεὶ ἐπικρατέοντα τὸν λόγον τὸν ἑωυτοῦ, εἴπερ ἐόντα γινώσκει καὶ ὀρθῶς ἀποφαίνεται. Ἀλλ' ἐμοί γε δοκέουσιν οἱ τοιοῦτοι ἄνθρωποι αὐτοὶ ἑωυτοὺς καταβάλλειν ἐν τοῖσιν ὀνόμασι τῶν λόγων αὐτέων ὑπὸ ἀσυνεσίης, τὸν δὲ Μελίσσου λόγον ὀρθοῦν. (Hp. *Nat.hom* 6.34 L) (P 94)
>
> The best way to realize this is to be present at their debates. Given the same debaters and the same audience, the same audience, the same man never wins in the discussion three times in succession, but now one is victor, now another, now he who happens to have the most glib tongue in the face of the crowd. Yet it is right that a man who claims correct knowledge about the facts should maintain his own argument victorious always, if his knowledge be knowledge of reality and if he set it forth correctly. But in my opinion such men by their lack of understanding overthrow themselves in the words of their very discussions, and establish the theory of Melissus.[160]

There is a similar discussion in the first book of *On Diseases*:

> Ὃς ἂν περὶ ἰήσιος ἐθέλῃ ἐρωτᾷν τε ὀρθῶς, καὶ ἐρωτῶντι ἀποκρίνεσθαι, καὶ ἀντιλέγειν ὀρθῶς, ἐνθυμέεσθαι χρὴ τάδε…ταῦτα ἐνθυμηθέντα διαφυλάσσειν δεῖ ἐν τοῖσι λόγοισιν· ὅ τι ἂν δέ τις τούτων ἁμαρτάνῃ ἢ λέγων, ἢ ἐρωτῶν, ἢ ἀποκρινόμενος…ταύτῃ φυλάσσοντα χρὴ ἐπιτίθεσθαι ἐν τῇ ἀντιλογίῃ (Hp. *Morb* 6.140-42 L)
>
> Anyone who wishes to ask correctly about healing, and, on being asked, to reply and rebut correctly, must consider the following…When one has considered these questions, one must pay careful attention in discussions, and when someone makes an error in one of these points in his assertions, questions, or answers…then one must catch him there and attack him in one's rebuttal.[161]

It is likely, then, that some works of the Hippocratic corpus were delivered orally. There are, for instance, Georgianic figures of speech including parallelism, antithesis, and

[159] *On the Nature of Man* 1.1 6.32L.
[160] Trans. Van der Eijk (1997), 94.
[161] Ibid, 94.

anaphora in the *Art of Medicine* and *On Breaths*.[162] And as Diocles of Carystos tells us, oral presentation was preferred, even in times when literacy was well-established.[163] So there might well be an oral component to medical literature that is not clearly sophistic.

Lexicography and the Second Sophistic

In listing the names of the parts of the body and in presenting this information before an audience, Rufus marks himself not only as a medical performer, but also as a lexicographer. Of course, these categories are not mutually exclusive. Like sophistry, lexicography was also manifestation of Hellenism. And the interests of the lexicographers were, for the most part, in line with the interests of the iatrosophists. Most fundamentally, there is a concern for linguistic purity – that is, an attachment to Attic Greek and a concerted avoidance of barbarisms and solecisms. Both lexicographers and iatrosophists wanted to prove to their audiences that they were classically educated and that they were well-versed in Hippocratic medicine.

As the preface to his *Onom.* makes clear, Rufus' project is about words. One needs to get a handle on nomenclature before doing anything else.

> **(1-5)** Τί πρῶτον ἔμαθες ἐν κιθαριστικῇ; Κρούειν ἑκάστην τῶν χορδῶν καὶ ὀνομάζειν. Τί δὲ πρῶτον ἔμαθες ἐν γραμματικῇ; Γνωρίζειν ἕκαστον τῶν γραμμάτων καὶ ὀνομάζειν. Οὐκοῦν καὶ τὰς ἄλλας τέχνας ὡσαύτως ἀπὸ τῶν ὀνομάτων ἄρχονται διδάσκειν, καὶ ὁ χαλκεὺς, καὶ ὁ σκυτοτόμος, καὶ ὁ τέκτων, πρῶτον καὶ σιδήρου ὄνομα, καὶ σκεύους, καὶ οὐτινοσοῦν ἄλλου τῶν πρὸς τὴν τέχνην. Καὶ ὅσαι σεμνότεραι, οὐχὶ καὶ ταύτας ἀπὸ τῶν ὀνομάτων ὡσαύτως ἄρχονται διδάσκειν; Τί γὰρ πρῶτον ἔμαθες ἐν γεωμετρίᾳ; Στιγμὴν, καὶ γραμμὴν, καὶ ἐπίπεδον, καὶ ἐπιφάνειαν, καὶ σχῆμα τρίγωνον, καὶ κύκλον, καὶ τὰ ὅμοια, εἰδέναι τε ὅ τι ἕκαστον αὐτῶν, καὶ ὀνομάζειν ὀρθῶς.

[162] Jouanna (1988), 10-24. For more on proems in the Hippocratic corpus, see Lara Nava (1992), 343-50.
[163] Wellmann (1912), 160.

> [1] First of all, did you learn to practice cithara playing? Being able to touch and name each one of the chords. And what must you know to practice grammar? Discerning and naming each of the letters. The same is also true for the other arts, for which we begin to learn the names: the metalworker, the leather-cutter, and the carpenter. First one learns the names of iron and carrying-pails and all of the other objects used for that craft. And what about the other more serious skills? Do they not begin with the discovery of the names of things? What do you learn first in geometry? Knowing and correctly naming the point, the line, the plane, the surface, the shape of a triangle, the circle, and other similar things.

And in his epilogue, Rufus returns to the words, saying that he was as inclusive as possible:

> (233.) Τὰ μὲν πλεῖστα τοῦ ἀνθρώπου οὕτω χρὴ καλεῖν· εἰ δέ τι ἐν τούτοις καὶ παραλέλειπται, οὐ μὴν δίκαιον τὰ πολλὰ ἀτιμάσαι διά τινα ὀλίγα παροφθέντα

> [233] These, then, are the majority of the terms that should be used to describe the parts of the human body. If anything among these has been omitted, it would be unjust to hold the bulk of terms in contempt simply because a few have been neglected.

Since Rufus is providing a list of words, a glance at other medical lexica might prove useful. The earliest Hippocratic lexica were written by Xenocritus of Cos and Bacchius of Tagara, though there is little evidence about the former. Erotian's Hippocratic lexica, composed in the first century CE, relies heavily on Bacchius, whom he cites nearly seventy times.[164] There are, however, difficulties with the evidence: an unknown redactor abridged and alphabetized Erotian. Bacchius' lexicon was similarly edited by Epicles the Cretan, and Erotian drew from this version. Nonetheless, Johannes Ilberg and Ernst Nachmanson argue that it is possible to reconstruct Erotian's "Urglossar."[165] Erotian went from treatise to treatise, describing words from one treatise before moving on to the next.

[164] Von Staden (1994), 550.
[165] Ibid, 551.

Erotian suggests in his preface that "obsolete usage" motivated Greek lexicography. And Galen claims that Bacchius only referred to obscure words (*glottai*).[166] While it is true that the *glossai* of Philitias, Simias, and Zenodotus interpreted rare words from epic and lyric, Bacchius seems to have investigated a wider range: obsolete words, morphologically interesting words, and words needing semantic clarification. He even selects some common words like *halis*, which have become "semantically bleached."[167]

Of particular note in Bacchius lexicon is his reliance on non-medical texts, particularly Homer, Democritus, and Aristophanes, to explain Hippocrates. Erotian follows suit, and himself references Democritus, Herodotus, Thucydides, Plato, Aristotle, Praxagoras, and Homer. Herophilus and Erasistratus make frequent appearances, but the orators are absent. Certainly this begs the question: Why should a lexicographer turn to poetry to explain scientific texts? The answer seems to be that there was no sharp distinction between "literary" and "sub-literary" works. And beyond that, if the goal is to explicate confusing words, the tools chosen to do so are not all important.

Most literature of the period used archaizing language, that of Athens in the 5th and 4th centuries BCE. In particular, it used classical forms -- the double tau instead of the double sigma, for instance, and the deictic iota. There was also a reinstitution of the dual; the dative case; the middle voice; and the optative mood, all of which had slipped from popular use. The ability to Atticize was seen as a marker of the elite and a sign of cultural purity. Non-Attic elements, on the other hand, were considered "barbarisms."[168] There is, of course, the question of what makes a term "Attic." To aid this task, there are lexica which define correct usage: Harpocration's *Usage of the Ten Orators*, Aelius

[166] Galen.*Expl.voc.Hipp.Prooemium.*XIX.64-5.
[167] Von Staden (1994), 565.
[168] Whitmarsh (2005), 43.

Dionysius' *Attic Words*, Phrynichus' *Selection of Attic Words and Phrases*, and Pollux's *Onomasticon*. As Whitmarsh notes,[169] these lexica are "normative," in the sense they prescribe, rather than describe language. Yet it is difficult to explain what constitutes a pure standard, so "experts" are needed to contest the rules.[170] But Atticism is more than just the correct use of grammar and vocabulary. It is also a means of exploring cultural identity.

As there was no codification for Atticism as such, lexicographers of the 2nd century had to establish authority within their own works. They did this largely by appealing to the established orators of the 5th and 4th centuries BCE. Turning to some specific lexicographers, Phrynichus, who lived in the 2nd century CE, championed the use of "pure" Greek by quoting liberally from Plato, Demosthenes, Thucydides, Xenophon, Aeschines, Socraticus, Critias, Antisthenes, and Aristophanes.[171] His *Ecloga* compiled improper uses of language (*tas adokimous ton phonon*) and argued that Greek must be used "in the old way" (*archaios*) (203). Phrynichus aimed to avoid words not found in Classical texts, preferring the Attic equivalents. So for instance, *charin eidenai* (to give thanks) replaced *eucharistein. The Praeparatio Sophistica* was the longer of Phrynichus' two works. Its purpose was to supply useful words for the rhetor. Again in this work, Phrynichus quoted from Attic writers of the 5th and 4th centuries BCE. As a general remark, his works were prescriptive rather than descriptive, giving phrases without suggesting *how* to use them. But beyond appealing to his familiarity with the Attic dialect, Phrynichus also sought to promote himself by seeking imperial patronage: His

[169] Ibid, 45.
[170] Swain (1996), 43.
[171] See Georgakopoulou and Silk (2009), 100 for an in-depth discussion.

Ecloga were dedicated to Cornelianus, the imperial secretary, and his *Praeparatio Sophistica* was dedicated to Commodus.[172]

Another lexicographer worth considering here is Moeris. His lexicon is likely from the 3rd century CE, and it was clearly influenced by Phrynichus'.[173] Moeris' work is alphabetical and offers synonyms for obscure words. Like Phrynichus, he quotes abundantly from Attic authors -- Plato, Aristophanes, Thucydides, Xenophon, Demosthenes, Antiphon, Hypereides, and Isaeus -- , though he pointedly avoids the tragedians. He also holds to the morphological and phonological tendencies of the Attic dialect (*glotta* versus *glossa*; and *neos* versus *naos*, for example). Yet unlike Phrynichus, Moeris is less critical of non-Attic variants: he simply puts the old word first and then lists recent alternatives. He compares Greek speakers (Hellenes) to Attic speakers (*Attikoi*) without explicitly attacking the former, though of course, his preferred choice is clear from the textual ordering.

One last work to take into account is Pollux's ten book *Onomasticon*. Pollux was a student of Hadrian of Tyre, and his work, unlike those of the previously mentioned lexicographers, was a thematic list, complete with synonyms and brief explanations. Like Phrynichus, he was influenced by Plato, Xenophon, and Hesychius, but his lexicon does not quote these authors word-for-word. His authority, then, is established less through the excerpting of classical authors, and more through the study of specialized lexica. So while there was a range of lexicographical forms associated with the Second Sophistic, all were interested in a filtering of acceptable language. And all aimed to leave an impression on their audiences of a well-researched text.

[172] Photius, *Bibl.Cod.*158.
[173] Swain (1996), 51.

Rufus' Interest in Dialectical Purity

As mentioned, one quality that links both lexicographers and iatrosophists is a concern for dialectical purity and an awareness of sub-standard terms. This interest is certainly prominent in Rufus' texts, as the Athenian name for a particular body part tends to have more credibility for him. In *Onom.*33, for instance, Rufus explains that the Athenians call nasal secretions *muxes*, and they call the state of having these secretions a "cold:"

> (33) Ἀθηναῖοι δὲ καὶ μύξας ὀνομάζουσιν. Ἱπποκράτης δὲ τὸ διὰ αὐτῶν φλεγματῶδες περίσσωμα ἰὸν μύξαν καλεῖ· Ἀθηναῖοι δὲ τὸ περίσσωμα τοῦτο κόρυζαν καλοῦσιν
>
> [33] The Athenians call the phlegmatic secretions of the nose *muxes*, while Hippocrates calls them *muxa*. The Athenians refer to the condition of having nasal secretions as a "cold."

And since Attic Greek is the preferred standard, Rufus often refers in disparaging ways to doctors and other intellectuals who are not Greek. For him, it is patently not Greek to use the term "*male*" for the armpit:

> (75) Μασχάλη δέ ἐστι τὸ ὑπὸ τῷ ὤμῳ κοῖλον, εἰς ἣν τὰ πολλὰ ὀλισθαίνει ὁ ὦμος. Μάλην δὲ οὐχ ἑλληνικὸν ὀνομάζειν·
>
> [75] The *maschala* (armpit) is the hollow under the shoulder, where the shoulder most often slips. It is not Greek to use the word "*male*" for "armpit."

And in describing the sutures of the brain, Rufus mentions certain Egyptian doctors who spoke Greek badly:

> Ὀνόματα δὲ αὐτῶν παλαιὰ οὐκ ἔστιν, ἀλλὰ νῦν ἐτέθη ὑπό τινων Αἰγυπτίων ἰατρῶν φαύλως ἑλληνιζόντων·

> [133] The names of these sutures are not old, but the current names were given by certain Egyptian doctors who speak Greek badly.

To be sure, however, there are times when Rufus points of dialectical differences without adjudicating between them. When discussing the elbow, for example, Rufus notes that the standard term in "*olekranon,*" but the Dorians who live in Sicily call it the "*kubiton"* (*Onom.*79). In this instance, Rufus does not say that the Dorians were wrong, just that their chosen term is different. To an extent, then, Rufus seems to care about cultural purity. But he is also trying to be comprehensive in listing the range of available anatomical terminology. However, like other lexicographers, Rufus is at great pains to show his learning; he is well-read and quotes from an extensive range of authors – both technical and more literary. He is eager to show his mastery of the Hippocratic material, and Homer is his most cited non-medical source.

Yet in many ways, Rufus is more of a doctor than a lexicographer. His treatises are not organized by word, but by body part. That is to say, rather than presenting a word and then giving its meaning, Rufus points to a part and then offers a range of possible names. His aim is not to explain obsolete or confusing words but to enable his audience to learn medical science. Nomenclature for him is a tool for scientific discourse, not an end in itself.

Iatrosophistry: Performative Aspects of Medicine

If he is not solely a lexicographer, another possible label for Rufus could be that of a "iatrosophist." As Bowersock explains,[174] Dio Chrysostom describes three types of

[174] Bowersock (2010), 83.

performers and speakers in his First *Tarsian Oration*,: (1) those who praise the city, (2) those who describe the gods and cosmos, and (3) medical lecturers who point out bones, joints, and organs. Polish excavators even found auditoria where such lectures took place; they even had depressions in the floor where bodily fluids could drain.[175] In any event, this third category is distinct from true doctors who heal and prescribe medication. Yet some doctors clearly had a foot in both worlds. Galen, most notably, held well-attended lectures in Rome, though he himself disliked the term "sophist"[176] and contrasted *iatroi* with *logiatroi*.[177]

Von Staden notes that as part of the Second Sophistic, declamations were made before large crowds. These involved rhetorical re-enactments in public arenas, a certain amount of improvisation, and an obvious preoccupation with language. Galen's works *De Arte* and *De Flatibus* were clearly epideictic.[178] This point is underscored by the contrasting use of the words "*demosiai*" (publicly) and "*idiai*" (privately).[179] Galen performed dissections on mice, birds, pigs, goats, oxen, horses, monkeys, and elephants before his audience,[180] popularizing the practice of public medical demonstrations in Rome.

Galen promoted this practice, as he thought Empiricists and Methodists undervalued anatomy. The Empiricists had epistemological objections: dissections investigate hidden causes, not experience. According to Celsus, Empiricists think that dissection does not show the normal conditions of the body and that the very act of

[175] Majcherek (2003), 25.
[176] Galen. *In Hipp.prognost.comm.* (Kühn) 118b, p.258.
[177] Galen. *In Hipp.de nat.hom.librum.comm* (Kühn) 15, p.159. Compare Aelius Aristides who mentions a doctor named Satyrus who was also a sophist: Arist.*Or*.49 Keil (*Hier.Log*.3.8).
[178] See Bowersock, *Greek Sophists*, 59-75.
[179] Galen. *Anat. Admin.* VIII.8.
[180] Galen. *De Anatomicis Admin.* IV.1, VII.10.

dissection damages them. It is better to take advantage of living examinations. However, Galen calls this "adventitious anatomy" (*epeisaktos anatomia*) in *MM*.X.100. The Methodists, on the other hand, use reason and attempt to teach the "method" of medicine in a six month period (*MM*.X.781, 927). Yet Galen claims they attempt "belief without demonstration" (*MM*.X.76).

Establishing one's authority is central to the practice of sophistic medicine; it guarantees a physician's credentials and encourages trust between him and his patients. One means to this end is to co-opt the rhetoric of another trusted author. As an illuminating example, Aude Doody has written on the pseudonymous *Medicini Plinii*, a work of extracts composted in the 4th century and drawn mostly from Pliny the Elder's *Historia Naturalia*.[181] While the *Historia Naturalia* has medicine as its focus in Books 20-32, the *Medicini Plinii* belongs to the tradition of medical compendia and is more diffusely medical. But in any event, author claims the influence of Pliny in his title.

But one of the more obvious ways to establish authority in a text is through the liberal use of the first person. In our current practice of scientific and technical writing, the use of the first person pronoun is discouraged. We tend to hold to the post-Newtonian idea that science deals with objective truths and that the author of scientific treatises ought to slip from view. Yet prior to the influence of Newton's *Principia*, we find that what is most predominant in scientific discourse is a "person-centered rhetoric."[182] More specifically, in ancient Greek science, we find a *first* person rhetoric. G.E.R. Lloyd thus speaks of the tendency towards "egotism" in Greek philosophical and technical writers.[183] The first person was so common, in fact, that Von Staden has labeled several distinct

[181] Doody (2009), 96.
[182] Machamer (1991), 143.
[183] Lloyd (1987), 58. For the same point, see also Debru (1990), 79-89.

categories for its use:[184] (1) Nomenclative ego (when an author is concerned with a term's precision); (2) ego of *dispositio* (when an author provides cross references in his own text); (3) autopic ego (when an author deals with patients); (4) ego as a reader (when an author describes himself as a reader of other medical texts); and (5) ego of scientific independence (when an author adjudicates between his rivals).

Von Staden has applied these categories extensively to Celsus,[185] noting that Celsus uses the first person singular 240 times, either by pronoun or verb. He is not aggressively polemical, though he does criticize both his predecessors and contemporaries. Celsus' self-assertion does not manifest itself in his descriptions of physiology. And when describing parts of the body, Celsus often uses impersonal terms: *videtur* (it seems), *oportet* (one should), *debet* (one ought), and *decet* (it is fitting). However, Celsus is particularly concerned with "nomenclative precision;" it is something that he views as an authorial responsibility.[186] So it is in the context of naming that Celsus inserts himself into his texts. We do not see impersonal constructions like *vocatur* (it is called). Nor do we find vague third person constructions like *vocant* (they call), or even *vocamus* (we call), but rather *voco* (I call). Celsus is reluctant to coin new words, preferring to make good choices from among the words that already exist. But he is fond of what Von Staden labels the"ego of dispositio."[187] Celsus demonstrates that he is aware of and in control of his own text, foreshadowing what he will say and reiterating what he has already said.

[184] Von Staden (1994), 103-17.
[185] Ibid, 106.
[186] Ibid, 106.
[187] Ibid, 110.

In contrast to Celsus, Galen's authorial voice is particularly egocentric. Nutton notes that Galen refers to himself, either with a first person pronoun or with a first person verb, 110 times in his *De Motibus*.[188] By way of comparison, Rufus, in his *Quaestiones Medicae*, a work of similar length to the *De Motibus*, uses first person verbs twelve times and the first person pronoun twelve times as well. Of these pronouns, five instances are the less assertive *"dokei moi."*[189]Of course, not all Greek science is as insistent in its use of the first person singular. In Aristotle, for instance, the words "*ego*," "*emos*," and "*emaut*- "are rare. Aristotle does, however, use the first person plural as well as first person endings on verbs. And there are alternatives to the first person singular. One can use impersonal expressions like "it is clear" or "it appears." One can also use the second person pronoun for the addressee to show a contrast with the "ego" of the author. Alternatively, one can use the first person plural and have in mind a range of potential references. The writer could be using the authorial "we" for himself alone. For instance in Pliny's *Historia Naturalia* 37.177, we find: *De opsiano lapide diximus priore libro* (we have spoken about obsidian in an earlier book.) But in other instances, the author could also be referring to (1) himself and a dedicatee; (2) to himself and a reader qua reader; (3) to himself and a reader qua practitioner of a particular skill; (4) to himself and his community; (5) to himself and the people of today; or (6) to himself and all humanity.

Another tactic for authorial self-assertion is through the polemical approach to other doctors. Here an author contrasts the ineptitude of other doctors to one's own expertise:

[188] Nutton (2009), 58.
[189] Ibid, 59.

> Multi medici se [medicos] adversum hoc malum non inveniunt. Ego certe raro quemquam huic pesti ereptum qui se illis credidisset.
>
> Many doctors do not find themselves confronted by this illness. I certainly know someone who dies suddenly because of this rare affliction who had entrusted himself to them. (*Medicina Plinii* I.26.5)

Once again, Galen is the most outstanding example of this approach. Many of Galen's cases were agonistic in nature, involving rivals, witnesses, and the language of athletic competition. Certainly, both rhetoric and athletics were masculine activities, and Plutarch describes rhetoric as a sort of exercise, *gymnasion*.[190] But in addition to athletics, Galen also uses the language of political disagreements; the competition between doctors is a form of *stasis*. The competitor is sometimes another physician, sometimes an anonymous group, and sometimes a younger, less experienced version of oneself. Nonetheless, what is most striking about Galen's depiction of his rivals is that it is so openly hostile; Galen's portrayal of his own authorial voice is one based on contrast.

But Susan Mattern poses the important question: If medical display is figured as a competition, how does one win?[191] The answer seems to be that one can (a) cure a patient; (b) identify a problem, particularly on an animal being vivisected, or (c) predict the course of a disease. The concomitant question is: What is one competing for? And the answer for this, in part, is gaining some power over the patient. But more than that, it is gaining the approval of spectators. Words of wonder, "*thaumazein,*" for instance, abound in Galen's corpus and indicate an attainment of this goal. The witnesses identify the victor and audibly offer their support. By contrast, an author can also adopt the rhetoric of another doctor or other intellectual whom he trusts, and this can be seen as an indication that he is at the same level.

[190] Plutarch, *Moralia* 130A-B.
[191] Mattern (2008), 76.

Rufus' Use of Personal Pronouns

So how do Rufus' anatomical texts compare to those of Celsus and Galen? The first person pronoun finds expression seven times in Rufus' texts.[192] Six of these are in the form "it seems to me" (*dokei emoi*). The stronger nominative form only appears once, in *Onom.* 134:

> (134.) Οὗτοι δὲ καὶ τῶν ἄλλων ὀστῶν μόρια ὀνομάζουσιν ἀνώνυμα τοῖς πάλαι, ἃ ἐγὼ οὐ παραλείψω διὰ τὴν εἰς τὰ νῦν τῶν ἰατρῶν δήλωσιν
>
> [134] These doctors named parts of the cranial bones, which were once nameless. I will not pass over these names because they reveal the current conventions of doctors.

Here, not only is Rufus giving the proper term, but he is also suggesting that there is some value in keeping current with medical trends.

The dative forms seem to fall into two categories: Rufus' dealing with his audience (i.e. "It seems to me that this is how the lesson should proceed"), and Rufus' interpretation of other doctors' work (i.e. "It seems to me that this is how X understood Y"). In the first category, we have *Onom.* 7 and 8:

> (7-8) Ἐμοὶ μὲν οὐ δοκεῖ ἐκεῖνο ἄμεινον· οὐκ εὐμαθὲς δὲ καὶ ῥᾷστον οὕτω καὶ μανθάνειν αὐτὸν, καὶ ἕτερον διδάσκειν. Καὶ τοῦτό μοι δοκεῖ οὕτως.
>
> [7-8] This does not seem better to me. It will not enable you to learn it yourself or to teach it to others. At least, that is how it seems to me.

And in the second category, we have *Onom.* 88, 155, 206, and 229.

> (88.) Δοκεῖ δέ μοι Ἱπποκράτης πᾶν τὸ πλατὺ τῆς χειρὸς θέναρ ὀνομάζειν

[192] *Onom.*7; 8; 88; 134; 155; 206; 229..

[88] It seems to me that Hippocrates calls the *thenar* the entire spread of the hand.

(155.) τραχήλου σφόνδυλον, Ἱπποκράτης ὀδόντα δοκεῖ μοι καλεῖν.

[155] It seems to me that Hippocrates calls "tooth" the first vertebra of the neck.

(206.) Ἐμοὶ δὲ δοκεῖ Διονύσιος ἐοικὸς μέν τι φλεβὶ τὸν ἐπανθισμὸν ὀνομάζειν, οὐ μὴν αὐτόφλεβα, ἀλλά τι ἄλλο ἐπίκτητον ἀγγεῖον αἵματος.

[206] But it seems to me that Dionysius was using the word to describe something similar to a vein -- not a vein itself -- but perhaps some vessel newly filled with blood.

(229.**)** Τὸ δὲ βρέφος περιέχεται χιτῶσι, τῷ μὲν λεπτῷ καὶ μαλακῷ· ἄμνιον αὐτὸν Ἐμπεδοκλῆς καλεῖ· ἐντεῦθεν, μοι δοκεῖ, καὶ ἡ Εἰλείθυια Ἀμνιὰς ἐπωνόμασται, μᾶλλόν περ ἢ ἀπὸ τοῦ ἐν Κρήτῃ λιμένος

[229] The fetus is wrapped in membranes. One of these is thin and soft; Empedocles calls it the amniotic fluid. It seems to me that it is from this name that Eileithuia has the surname "Amnias," not from the name of a port in Crete.

Nowhere does Rufus use the "*dokei emoi*" form to adjudicate between rival interpretations or to offer his own view.

Verbs of Naming in Rufus

In his anatomical works, Rufus uses three different verbs of naming: καλῶ, ὠνόμαζω, and λέγω, καλῶ being almost twice as common as the others combined. The first person, both in the singular and plural, is rare in Rufus. He uses the verb λέγω once in *Anat.*67 and καλοῦμεν once in *Onom.* 11:

(67) Ἀδένες εἰσὶ συστροφαὶ ποσῶς πιμελώδεις, καὶ σαρκώδεις ἰδίως κατακεχωρισμέναι εἰς τοὺς κοίλους τόπους, μασχάλας λέγω καὶ βουβῶνας, ἔτι δὲ καὶ μεσεντέριον

[67] I call "glands" the somewhat fatty and fleshy compounds, located primarily in hollow areas like the armpits, groin, and mesentery.

(11) θώρακα γὰρ οὐ μόνον τὰ ἀπὸ τῶν κλειδῶν μέχρι τῶν ὑποχονδρίων καλοῦμεν, ἀλλὰ καὶ τὸ σύμπαν ἀπὸ κλειδῶν μέχρι τῶν αἰδοίων.

[11] We call the "thorax" not only the part which extends from the collarbones to the navel, but that which extends from the collarbones to the genitalia.

Rufus' most frequently used verb form in the *Onom.* is the third person plural in the active voice ("they call"). More than one third of his instances of naming follow this formula, yet Rufus almost never gives specific subjects. "Athenians" are the subjects in 32, 33, and 107, and "doctors" are the subjects in 133 and 135. But all other instances involve an anonymous "they." The second most frequent verb form in the *Onom.* is the infinitive, always in δεῖ or χρὴ constructions ("it is necessary to call"). These instances comprise almost one quarter of the verbs of naming. Next come the passive verbs ("something is called"); these represent one fifth of the verbs. Another fifth are third person, singular active forms ("X calls something Y"). For these, Rufus does supply specific subjects: Hippocrates, Homer, Euryphron, Herophilus, Praxagoras, and Empedocles. Lastly, there are occasions when the names themselves (ὀνόματα) are the subjects (*Onom.* 133, 198). In the *Anat.*, passive constructions predominate. Three quarters of the verbs of calling take this form. Next are the third person plurals, which comprise less than one fifth of the verbs of calling. Again, these verbs have no specific subjects. And last are the infinitive and first person singular, each of which appears once,

Numbers aside, what all this shows is that Rufus, qua active namer, tends to slip from view. Other people call certain parts X; parts are called X; it is necessary to call parts X; but almost never *I* call parts X. Rufus is certainly a dutiful compiler, but he is not aggressively self-assertive. One point to consider, however, is that Rufus silently inserts himself into the anonymous third person plural subjects. In the cases where Rufus does not object to a particular name, "they call" should be taken to mean "they *and* I call."

Visual Display in Rufus' Texts

One further way for a iatrosophist to assert himself is through his visual display. That Rufus has an audience is clear from the outset of the *Onom.* Throughout the preface, Rufus addresses someone in the second-person singular:

> (1-6)Τί πρῶτον ἔμαθες ἐν κιθαριστικῇ;…Τί δὲ πρῶτον ἔμαθες ἐν γραμματικῇ; …Τί γὰρ πρῶτον ἔμαθες ἐν γεωμετρίᾳ; …Βούλει οὖν καὶ τὰ ἰατρικὰ ἀπὸ τῶν ὀνομάτων ἀρξάμενος μανθάνειν,
>
> [1-6] First of all, what must you know to practice cithara playing? … And what must you know to practice grammar? … What do you learn first in geometry? …Do you also want to learn medical science, beginning first with nomenclature?

There are also several verbs of seeing as well as some deictic gestures. In *Onom.* 129, Rufus says that his companion sees the pericranium:

> Ὅρα δὴ τοίνυν τὸν ὑπὸ τῷ δέρματι τοῦ κρανίου χιτῶνα· οὗτος περικράνιος καλεῖται·
>
> [129] Next you see the membrane under the skin of the head. This is called the pericranium.

And in 186, Rufus uses the verb form "*eidomen*" to describe vascular *parastatai*:

> ἐν δὲ προβάτου ὑστέρᾳ εἴδομεν ἐκ τῶν διδύμων πεφυκότα τὰ ἀγγεῖα κεκιρ-

σωμένα ἑκατέρωθεν·

But we see that on the uterus of ewes, vascular vessels emerge from either side of the *didumoi* (testicles).

In terms of deictic elements, Rufus seems to be pointing to his models on display. In *Onom.* 9, Rufus tells his audience to look at *this* slave:

(9.) οὕτως. Ἀκούων δὴ καὶ ἀποβλέπων εἰς τὸν παῖδα τοῦτον διαμνημονεύσεις τὰ ἐπιφανῆ πρῶτον·

[9] If you listen and look at this slave, you will, first of all, commit to memory the external, visible parts.

And he returns to this deictic mode when he points to the monkey:

(127.) Τὰ μὲν οὖν ἐπιφανῆ, ὦ παῖ, σὺν τοῖς ὑποκειμένοις ὀστοῖς οὕτω χρὴ καλεῖν τὰ δὲ ἔνδον τουτονὶ τὸν πίθηκον ἀνατέμνοντες, ὀνομάζειν πειρασόμεθα·

[127] These, then, o child, are the visible parts -- along with their underlying bones -- that it is necessary for us to name. We attempt to name the internal parts by dissecting the monkey.

Besides pointing out parts to his audience, Rufus also displays his showmanship in his actual anatomizing of the monkey. As I shall discuss, Rufus' description of the dissection suggests that his overarching concern is for an efficient, head-to-toe display of the animal's organs. This requirement entails having multiple, pre-prepared specimens at his disposal.

It should be noted that there are many ways to perform a dissection: complete evisceration, dissection in blocks, and dissection in situ. Each has concomitant costs and benefits which the anatomist needs to prioritize. In a complete evisceration, all organs can be examined separately and thoroughly. But because attachments are severed, the

organs cannot be put back in place exactly, and demonstrations are not repeatable. With dissection in blocks, the chest, abdomen, and pelvic organs are removed *en masse*, in blocks. The mass can be difficult to handle and awkward, but this form of dissection has the benefit of preserving attachments between organs. Dissection in situ is the least invasive option. There is little chance of introducing injury during the process of cutting, and because anatomy is preserved, demonstrations are repeatable. But of course, organs left in the body are harder to see and can only be examined from a limited number of angles.

So what form of dissection does Rufus use? Unlike Galen, Rufus never details his process of anatomizing the monkey. But it seems that he is not dissecting in blocks, as he discusses the organs separately. And the fact that he includes comments about the organs' shapes suggests that he has removed them fully from the body. That being said, if Rufus is fully eviscerating the monkey, which the narrative does suggest, the process could not be happening in real time, unless Rufus has many monkeys on the go.

In cutting open the monkey, the easiest method would be for the animal to be lying flat on its back. In this case, the organs would be encountered and removed chest-to-back. Indeed, modern autopsies start by removing the rib cage, thereby revealing the chest cavity. The abdominal and pelvic organs are examined after removing the intestines and fat overlying them. The brain can be investigated either before or after the rest of the body. But the point is that dorsally located internal organs cannot be immediately accessed. Yet Rufus' dissection is performed head-to-toe, in parallel to the scheme he used in examining the external parts of the slave. But the only way a head-to-toe narrative would work would be if Rufus had multiple cadavers pre-prepared, with various layers

removed. In this way, Rufus' narrative suggests a rehearsed performance, one meant to download material in an expedient way. It is also an indication that Rufus has his audience's needs in mind. No extra time is lost in the messiness of evisceration. Rufus can run through his narrative of the organs in the order that he wishes.

The "capite ad calcem" arrangement is common in medical texts.[193] Herophilus' investigations were organized in this way, as were the surviving summaries from the early Empire. Sometimes, the author would take a "double trip" from head to toe – once on the outside of the body, and once on the inside.[194] This technique is also apparent in Scribonius Largus' *Compounds*, a Latin pharmacological treatise from 44-48 CE. Even in terms of pathology, in the Hippocratic *On Affections* and *Diseases II*, the author starts with phrenitis, an affliction of the head, and ends with diarrhea. Total body afflictions, like elephantiasis, were listed last.

But there are other options to this head-to-toe scheme. While Galen follows a roughly top-down pattern in *On the Dissection of the Nerves* and *On the Dissection of the Muscles*, he is not married to this organization. In *On the Therapeutic Method*, Galen uses a typology based on divisions between homoeomerous parts -- that is to say, uniform parts like blood and bone --, and anhomoeomerous parts like hands and eyes. And in his *On the Usefulness of the Parts*, Galen divides the parts of the body by their usefulness, *chreia*, depending on what is useful for the soul.[195] So a horse has strong hooves and a free-flowing mane because its soul is proud. And a lion has pointed teeth because its soul is savage. For humans, hands are especially important because they are involved in

[193] Flemming (2007), 253.
[194] Cf the pseudo-Galenic *Introduction and Medical Definitions* 10-11 and 36-60: XIV 699-720. On Herophilus' use of this technique, see Von Staden (1989), 138-241.
[195] Galen, *UP* 1.2. Flemming (2007), 264 ties this sort of arrangement to Imperial discourse: Each body part is distinct yet linked to other parts. And the brain is the "centralized government" of the body.

writing, building, and crafts, all uniquely human acts.[196] So hands comprise the first book; then arms, which aid the hands; then legs, which are needed for bipedal motion; then the organs used for nutrition; then pneuma, eyes, the rest of the face; the spine; shoulders; reproductive organs; and lastly, parts common to the whole body, like blood vessels. Galen's *On Anatomical Procedures* follows a similar organization: hands, legs, and then muscles.[197]

That Rufus has the liberty to perform a head-to-toe display suggest that he has a number of monkeys to hand. But since he does not discuss the availability of his animal specimens, it is useful to turn to Galen as comparanda. Galen's opportunities to work with human cadavers would have been limited. In his *De Compositione medicamentorum per genera* XII.604K, Galen says he performed dissections on the bodies of Germans in the Macromannic Wars. And in *AA*.II.385-6K, Galen says that one should take advantage of chance opportunities to study the exposed bodies of brigands and children. Indeed, in *AA*.II.386K, Galen says that it is through the dissection of exposed children that anatomists can claim shared features between man and apes: καὶ παιδία δὲ τῶν ἐκτιθεμένων νεκρὰ πολλάκις πολλὰ ἀνατέμνοντες ἐπείσθησαν, ὡσαύτως ἔχειν κατασκευῆς ἄνθρωπον πιθήκῳ. But this example is in the third person plural, so Galen is, perhaps, distancing himself.

Despite limited access to humans, Galen made frequent use of animals in his experiments, though it is not always clear which species he was using in every case.

[196] Ibid 1.4.
[197] Galen, *AA*.2.3.

His studies of the brain used mostly the ox, but he also turned to apes, sheep, pigs, and goats.[198] Bovine brains had the advantage of being readily available at the market. But their large size also made demonstration easier. For Galen, there were six classes of animal "not far removed from the nature of man."[199] First there were the apes, a parody, μίμημα γελοῖόν, of humans.[200] Then follow bears; pigs; saw-toothed animals; horned and double-hoofed ruminants; and hornless, smooth-hoofed animals. This system gave Galen a fair amount of freedom in saying that his findings on one species could usefully be applied to humans. That being said, many of Galen's demonstrations were performed on primates, specifically five types: (1) *pithekos* (the Barbary ape of North Africa); (2) *lynx* (an unknown tailed ape); (3) *satyros* (likely not a gibbon, but perhaps a Rhesus monkey); (4) *kynokephalos* (a dog-headed baboon); and (5) *kebos* (a north eastern African Rhesus monkey).[201] The availability of certain animals would surely have factored into his choice. In *AA*.II.708K, Galen says that ox brains were readily available for sale in large cities. And Toynbee notes that goats were likewise inexpensive and easily obtained.[202] Despite his preference for apes, Galen says that dissectors should be prepared to anatomize other animals in case apes could not be obtained.[203]

But there is also some worry about the longevity of the prepared specimens. If they were to be examined over several days, varying rates of decomposition would set in, depending on the season and type of tissue. For this reason, once the animal is selected, the dissector should try to reveal the part as quickly as possible and to show it is many

[198] *AA*.II.708K. See also Woollam (1958), 14 and Savage-Smith (1971), 78.
[199] ὡς οὐ πόῤῥω τἀνθρώπου φύσεως ὄντα *AA*.II.423K.
[200] *UP*.II.p.273. 9-10.
[201] Singer (1956), 240, n.22 notes that although Galen preferred the Barbary ape because it was tail-less, he likely relied mostly on the more abundant Rhesus monkeys.
[202] Toynee (1973), 166.
[203] *AA*.II.227K. Jennison (1937), 128 says that there is no evidence for the breeding of domesticated monkeys, yet the number of primate specimens in Galen's experiments suggests a ready supply.

ways. In the absence of an ape, another animal will suffice, but it needs to be clear from the outset how this animal differs from an ape. All this goes to show that while primates were a limited resource, it is not impossible for Rufus to have had multiple cadavers.

Location of the Sophistic Movement

While Rufus shows glimmers of sophistic display, I have argued that his sophism is more modest than that of Galen. Here I shall examine whether Rufus' location or dates might have played a role. The major centers of the Sophistic movement were Ephesus, Smyrna, Athens, and Rome. Rufus is typically tied to Ephesus, and at the time he was working, Ephesus was a major city of the Roman province of Asia. In the first century CE, it was comprised mostly of Greek inhabitants who were loyal to Rome. It had an ongoing building program, and residents honored the emperor and governors. Ephesus certainly would have provided Rufus well, and there is no evidence that he ever travelled to Rome.[204] Inscriptions from Ephesus show that it has a vibrant medical community as well.[205] Many of its doctors met within the Museum, where they held feasts and had an annual competition in pharmacology, surgery, and instruments.[206] The winners had their names engraved on the wall of the Museum. The doctors also looked after the tombs of deceased members. Many were members of the town council, and some even had connections to the emperor or his servants. M. Aurelius Septimius Marinus, for example, was a massage therapist for Marcus Aurelius and Lucius Verus in the 160s.[207] Rufus and

[204] We know that Soranus, Ephesus' other prominent physician, did travel to Rome. But he reports being disappointed with the city, particularly its methods of child-rearing. *Gyn.* Ii.94.
[205] Samama (2003), nos. 201-19.
[206] Broughton (1938), 854-5 mentions a group of inscriptions which suggest that professors and lawyers shared the museum with the doctors.
[207] Wanel et al (1979), no. 629.

Soranus were certainly the most famous doctors to hail from Ephesus. But Caelius Aurelianus mentions a Magnus of Ephesus who wrote a work on rabies.[208]

Alexandria was often left out of the sophistic movement, though in part, this was because it was a blind spot of Philostratus, who did not particularly care for Egypt. But Alexandria is relevant to a discussion of Rufus, as he likely did some of his early medical training there.[209] In the early second century, Alexandria was the site of a renewed interest in working with anatomy and dissection. In many ways, this was a revival of the work of Herophilus and Eudemus in the second to third centuries BCE. Rufus, as an anatomist, was working in the early part of the revival, but as I suggested, he was not acting as a real iatrosophist would. While this could be linked to his association with the less sophistic Alexandria, it is worth considering as a comparandum the *De Virtutibus Herbarum*, a text attributed to Thessalius.[210] The work likely dates to the late first or early second century. In the preface, Thessalius discusses an individual from Asia Minor who received his training in Alexandria and went to lectures of "dialectical physicians." So there is some indication that rhetoric was part of Alexandrian medical education, even if it was less prominent there than in other locations. But Rufus' (relative) sophistic reticence could also be explained by the fact that iatrosophistry was still in its nascent stages when Rufus was writing.

However, a counterpoint to Rufus is Statilius Crito, another Ephesian working at the same time as Rufus. According to the Suda, not only did Rufus live during the reign of Trajan, bit he was a contemporary of an individual named "Crito," who was also a doctor:

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[208] Cael.Aurel.*Acute Affections*, iii, 360.
[209] Abou-Aly (1992), 28-31.
[210] Moyer (2011), 293 does not agree that Thessalius was the author.

῾Ροῦφος, ᾽Εφέσιος, ἰατρός, γεγονὼς ἐπὶ Τραιανοῦ σὺν Κρίτωνι.

Rufus, an Ephesian, a physician, along with Kriton, he lived under Trajan. [211]

But of Crito's works, we have only extracts in Galen and a reference in Arabic.[212] According to Galen, not only did Crito compile a work of pharmaceuticals, but he was also tied to the imperial house:

Κρίτωνι … κατὰ τὴν αὐτοκρατορικὴν οἰκίαν ἰατρεύσαντι.

Kriton ..., who had served the imperial household as a physician. [213]

However, Galen does not specify which emperor is in question. Besides using the Suda, it is possible to date Crito from Martial. In his epigram 11.60.6, Martial mentions a Crito who can cure satyriasis. This epigram can be dated to 96 CE, which is two years before Trajan became emperor.[214] John Lydus' *Magistrates* suggests that a Crito went on the Dacian campaigns (101-106 CE) with Trajan and wrote of the Dacian Wars.[215] However, it is not clear whether the physician and historian were, in fact, the same man. SEG IV.251 says his full name was Titus Statilius Kriton, and that he was a lead doctor (*archiatros*) to Trajan.[216] As for his status as an Ephesian, there is some evidence that

[211] *Suda* P 241.
[212] The Arabic source says that Crito's *Kosmetica* was translated by the 9th century. See Sezgin (1970), 60.
[213] Galen, *De compositione medicamentorum secundum locos* 12.445.14-15 Kuhn.
[214] Wellmann (1905), 581-3.
[215] John Lydus *De magistratibus*. II.28.2 = FGrH 200 F 1.
[216] Nutton (1977), 191.

Crito has at least semi-permanent residence in Ephesus. An Ephesian inscription dating to c.113 honored him.[217]

As further evidence that Rufus' date alone should not preclude Sophistic self-promotion, if we look at other physicians working before Rufus, we find stronger, more aggressive personalities. In the *Fragments of the Methodist School*, fragments 156 and 265 underscore this point, as they describe doctors who pre-date Rufus but are concerned both with money and with impressing the emperor. In his *On the Method of Therapy I.ii*.p.78K, Galen quotes Thessalius, a doctor to Nero. In the fragment, Thessalius criticizes the Hippocratics for introducing harmful ideas. But more than that, his assertiveness manifests itself in his announcement that he is founding his own medical school, one based on saying that other doctors were wrong. Similarly, in Fragment 265 from Pliny's *Natural History*, we again see this same Thessalius. Again he is portrayed as having a keen interest in money. And his aggression is apparent in his self-label "*iatronikes*" (conqueror of doctors). Yet another example is the epitaph for Tiberius Claudius Menecrates, a doctor who practiced before Rufus.[218] Menecrates was ambitious, authoring 156 books and starting his own medical school. The epitaph shows that he had a triple-barreled Roman name, was a doctor of emperors, and was honored in imperial courts. It seems, then, that Rufus' dates and (likely) place of study do not fully explain his reserved engagement with the Sophistic movement. Though it is a less satisfying answer, Rufus' reticence seems to be tied more to personality; there are some authors who reveal frustratingly little about themselves, and Rufus falls into this category. He

[217] Beneeim (1974), cols. 219.15-220.1.
[218] Samama (2003), no.461.

performs before an audience (ὦ παῖ, 127), and he cares about the niceties of language, but he does not promote himself in any sort of forceful way.

Chapter 5
Glossary of Medical Terms

αἷμα	blood
ἄκανθα	backbone
ἀκροπόσθιον	foreskin
ἀνθέλικα	prominence on the cavity of the middle ear
ἀνθερεών	chin
ἀντικνήμιον	shin
ἀρτηρίαι	arteries
ἄσκωμα	fully-developed breast
ἀστράγαλοι	balls of the ankle, vertebrae
αὐχη	neck
βάσις	brainstem
βλέφαρα	eyelids
βουβῶνες	groin
βρέγμα	coronal suture
γάλα	breastmilk
γαστὴρ	belly
γαστροκνημία	gastrocnemius

γένειον	chin
γλουτοι	buttocks
γνάθοι	jaw
γραῖα	skin under the navel
γυναικεῖος κόλπος	vagina
δάκτυλοι	fingers, toes
δειρή	throat
δέρμα	skin
διάφραγμα	diaphragm
δίδυμοι	testicles
ἐκφύσεις	whiskers
ἕλικα	periphery of the ears
ἐπιγάστριον	skin overtop the belly
ἐπιγλωσσίς	epiglottis
ἐπιγονατίς	patella
ἐπιγουνίδες	rectus femoris
ἐπίπλοον	omentum
ἐπίσειον	pubic region
ἐφήβαιον	pubis
ζυγώματα	acus zygomaticus
ἤβη	pubic bones
θώραξ	trunk
κεφαλη	head

ἰγνύα	hamstring
ἱδρὼς	sweat
ἱερὸν ὀστοῦν	coccyx
ἶρις	iris
ἰσχίον	sciatic nerve
καρδία	heart
καρπόν	wrist
καυλός	penis
κενεῶνες	flank
κεραῖαι	horns of uterus
κερκίς	radius
κιρσοειδές	cerebrum
κλειτορίδα	clitoris
κνήμη	tibia
κοιλία	belly, ventricles of brain, ventricles of heart
κοίλωμα τῆς ὑστέρας	Fallopian tubes
κόγχη	cavity in front of the anti-helix of the ear
κόλον	colon
κόρη	pupil
κόρσαι	temples
κραντῆραι	teeth
κρόταφοι	temples
κτεὶς	pubic region

κύαμος	immature breast
κύβιτον	elbow
κύλον	upper eyelid
κυνόδοντα	canine teeth
κύστις	bladder
κυψελὶς	earwax
λακκόπεδον	scrotum
λαπάραι	iliac cavity
λιχανός	pointer finger
λευκανία	throat
μάλη	armpit
μαστοί	breasts
μασχάλη	armpit
μεσεντέριον	mesentery
μεσομήρια	mid-thigh
μεσοπλεύρια	intercostal space
μεσόφρυον	space between the brows
μετάφρενος	midriff
μέτωπον	forehead
μῆλα	cheeks, tonsils
μήνιγγες	meninges
μήτρα	uterus
μυελός	spinal marrow

μύες	muscles
μυκτῆρες	nostrils
μύλοι	molars
μύρτον	clitoris
μυρτόχειλα	labia
μύστακες	moustache
μύξα	mucus
νῆστις	jejunum
νεῦρα	nerves
νεφροί	kidneys
νύμφη	clitoris
νῶτον	back
ὀδόντες	teeth, vertebrae
ὀμφαλός	navel
ὄῤῥον	perineum
ὄρχεις	testicles
οὖλα	gums
οὐρητικός	ureter
οὖρον	urine
ὄψις	eyeball
παραστάται	varicose spermatic vessels
παρεγκεφαλίς	cerebellum
παρειαί	ridges of the cheeks

περικάρδιος	pericardium
πῆχυς	ulna
πλατὺ νεῦρον	Achilles tendon
πλεύμων	lung
πλευρα	membranes over lungs
πλευραί	sides
πρόσωπον	face
πτέρνα	heel
πυγαὶ	buttocks
πυλωρός	pylorus
ῥίζα	root of the tongue
ῥιζωνύχια	nail-beds
ῥινὸς διάφραγμα	partition of the nose
ῥινὸς ῥάχις	bridge of the nose
ῥίς	nose
ῥυτίδες	brow
ῥώθωνες	nostrils
σὰρξ	flesh
σκέλη	legs
σιαγόνες	jaw bones
σίελος	saliva
σπέρμα	sperm
σπερματικὰ ἀγγεῖα	spermatic vessels

σπλήν	spleen
στέρνον	sternum
στῆθος	chest, palm of hand
στῆμα	penis
στιλοειδεῖς	styloid processes
στόμα	mouth, opening of uterus
σφαιρίον	tip of the nose
σφόνδυλοι	spine
σφυρα	ankle
σχίσμα	labia
σωφρονιστῆρα	wisdom teeth
τιτθοί	breasts
τομεῖς	incisors
τόνοι	tendons
τράπεζαι	surface of the molars
τραχείας ἀρτηρίας	windpipe
τράχηλος	neck
τυφλόν	caecum
ὑοειδὲς	hyoid bones
ὑπήνη	goatee
ὑπόθεναρ	area under the fingers, excluding the thumb
ὑπογλουτίδες	juncture between buttocks and thighs
ὑποχόνδρια	muscles supporting cartilage

ὑστέρα	uterus
φαρύγεθρον	throat
φάρυγξ	pharynx
φίλτρον	groove below the nose
φλέβα	veins
φλέγμα	phlegm
φρένες	diaphragm
χεὶρ	hand
χεῖρες	arms
χιτὼν χοριοειδής	choroid plexus
χολή	black bile
χυμον	digestive fluid
χυλον	digestive fluid
ὦμος	shoulder
ὠμοπλάται	shoulder blades

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