A CULTURAL HISTORY
OF THE HUMAN BODY

IN ANTIQUITY

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CHAPTER FOUR

Medical Knowledge and Technology

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The question of whether a physician knows what he is doing when he acts on the body is not a straightforward one. In asking it, are we trying to discover if the physician is familiar with, and has the skill to implement, the practices prescribed by the relevant medical tradition in a given clinical situation? Or are we interested in determining whether he has a grasp of the causes of the patient's illness and the reasons his therapy will bring about the desired outcome? What if the physician is working in a culture whose ideas about disease and therapeutic practices our own medical authorities deem fanciful or obsolete? If he adheres to the guidelines of his own culture, do we still believe that he knows what he is doing? How would our answer be affected by the outcome of his therapy?

Such questions have particular relevance to our understanding of the body in the ancient Greco-Roman medical tradition. On the one hand, in the nineteenth century, physicians and patients began to lose trust in the humoral medicine whose authority had been guaranteed for centuries by the names of Hippocrates and Galen. From a modern vantage point, the explanation of human nature in the late fifth-century B.C. treatise *On the Nature of a Human Being*, the first extant text to advocate a model of four humors, seems to be describing another species. We might respond to the text's alienating aspects by pointing out that the bodies of classical Greeks were undoubtedly much like our own and attributing the author's views to his ignorance about the

body whose nature he purports to describe. If his therapies had any success, we could argue, it was because they were actually time-honored folk remedies, recently endowed with (spurious) theoretical pedigrees; or we could attribute the results to the placebo effect.[1] None of this would be to say, however, that the physician knew what he was doing.

Yet, on the other hand, the very premise that the physician requires specialized knowledge of the physical body appears self-evident to us precisely because Greco-Roman medicine exercises such a strong influence on the Western medical tradition. It is because of the Greeks, in other words, that medicine seeks to know the nature of the body—indeed, it is because of the Greeks that we believe there is a concept of a physical body whose nature (*physis*) must be known by the physician (*iatros*). If, then, we are asking ourselves how medical knowledge and technology impact the understanding of the body in Greco-Roman antiquity, it is useful to distinguish between the body as a physical object with relatively stable characteristics over the last three millennia and the body that emerges in the classical period as an object of expert knowledge and care.[2] In fact, having examined the historical contingency of the body qua medical object, we may be in a position to rethink our privileging of medical views of the human body in the contemporary Western world.[3]

In this chapter, I give a brief overview of the body that takes shape in the different medical paradigms that, while ranging widely, participate in the Greco-Roman tradition of attributing disease to physical causes and excluding gods or demonic agents.[4] I leave aside, for the most part, the question of whether ancient medical knowledge about the body is factually correct. I concentrate instead on the ideas about the body that recur in learned medical texts, although I do take a brief look at the interaction between learned medicine and the cult of Asclepius, which first takes root in mainland Greece in the fifth century B.C. and flourishes in the Hellenistic and Roman imperial periods. Such an approach necessarily privileges an urban dweller's experience of medical knowledge, and I cannot do justice here to the diversity of what Vivian Nutton has called the "medical marketplace" in Mediterranean antiquity.[5] Nevertheless, I hope that by adopting the perspective that I have just outlined, I can shed some light on the close relationship between Greco-Roman learned medicine and Western concepts of the physical body. The article follows a roughly diachronic arc. For, from our earliest medical writings, it is clear that elite physicians, however much they sparred with one another about the nature of the body and the best way to care for it, saw themselves as participating in a continuous tradition.

It is worth saying a few words about the nature of our evidence. We are fortunate to have in the Hippocratic Corpus sixty-odd treatises, mostly dating from the classical period (late fifth and early fourth centuries B.C.) and probably organized into a corpus by scholars in the Alexandrian period (third through

first centuries B.C.).[6] Although these treatises have come down to us under the name of Hippocrates, we have no way of knowing whether any of them were authored by the historical Hippocrates; it is certain, moreover, that the texts were written by a number of different physicians.[7] Our evidence for the lively period between the fourth century B.C. and the writings of Galen in the second century A.D. is fragmentary and distorted by the prejudices and agendas of our source texts.[8] With Galen our evidence is again rich (his texts represent over 10 percent of extant Greek literature from before 300 A.D.).[9] On the basis of this material, I sketch an overview of some of the most provocative and influential models of the body generated by those who would have identified themselves as working within medicine (*iatrikê*, *medicina*). In the interests of providing some background, however, I begin with the Homeric and early archaic evidence.

THE KNOWLEDGE OF THE ARCHAIC HEALER

We cannot assume that the body as a whole is the healer's natural object of knowledge and care in the early archaic period. For, insofar as we can tell from our limited evidence, the concept of the body may not have been useful in this period. In Homeric epic (ca. eighth century B.C.), the person splits at the moment of death into an ethereal *psychê* bound for Hades and a corpse. Before this moment, however, the living person does not fracture along dualist lines. There is nothing (mind, soul, person), then, against which "the body" stands out as a singular entity.[10] Rather, the person can be described in various ways, each of which involves what we would call body. His emotions and thoughts are realized through a collection of substance-forces that scholars have tried, with limited success, to map anatomically.[11] He is at once a visible form (*eidos*), a built structure (*demas*), and a coordinated, agile group of limbs (*melea*); he is covered with skin (*chrôs*) that can be easily broken. But *sôma*, the word that regularly gets translated as body in the later Greek evidence, is used only a handful of times in the Homeric epics. In each case it is applied either to the corpse of an animal or a human corpse that has not been given proper burial.[12] The *sôma*, in short, is neither "the" body nor the concern of the *iatros*.

The expertise of the healer is, in fact, rather limited in the Homeric epics. In the *Iliad*, the healer exhibits special knowledge of drugs (*pharmaka*) and wound care. He is even less visible in the *Odyssey*, showing up once among other traveling craftsmen who might be welcomed into a royal household.[13] Moreover, that neither wound care nor pharmacology is the exclusive province of the *iatros*: at one point in the *Odyssey*, for example, a wound is treated with an incantation, and women in the *Iliad* prepare remedies.[14] Nevertheless, it seems clear that the healer's epistemic advantage lay primarily in his skilled use of the knife and his pharmacological knowledge, which may have enabled him to treat internal ailments.[15]

What is important to recognize in the present context is what the epic *iatros* apparently does not know. When Apollo sends a plague against the Achaean troops in the first book of the *Iliad*, Achilles asks for a seer, a dream-interpreter, or a priest to come forward to interpret not the cause of the plague—everyone agrees that Apollo is responsible—but the *reason* for the god's anger.[16] His request prefigures the medical interest in creating broad etiological frameworks through which to understand disease. Yet, no one suggests that the most prominent healers among the Achaeans, Machaon and Podalirius, have any insight to offer, as Celsus, a Roman encyclopedist who wrote a history of Greek medicine up until his own time in the first century A.D., did not fail to recognize.[17] It is the seer Calchas, rather, who steps forward to shed light on Apollo's anger.[18]

Calchas offers the Achaean army a form of expertise grounded in divination, not in the mechanics of the physical body. The close relationship between divinatory knowledge and healing can be understood in light of the fact that in the archaic period—and indeed throughout Greco-Roman antiquity—many diseases that lacked an obvious cause were attributed to divine or demonic agency, as was also the case, for example, in ancient Babylonia and many other cultures.[19] It is true that there are ailments that a hero suffers as a result of forces or stuffs within him: Achilles's anger in the *Iliad* can be seen as a kind of escalating disease for which the implacable hero is himself responsible. Here again, however, the *iatros* is no expert. It is the other heroes who try to temper Achilles's anger with healing words, albeit to no avail.

In short, then, despite that *we* might be willing to say the object, or one of the objects, of the archaic healer's knowledge is the physical body, our evidence suggests that it is unlikely that contemporary sources would have concurred, for the simple reason that "the" body is not yet available as a discrete object of expert knowledge. Nor is it clear that "the disease" is the object of his knowledge, since in the scattered references we have from early Greek poetry, diseases are allied with nebulous demons who may have been engaged by a diviner or purifier.[20] The healer acts on the patient by means of *pharmaka* and the surgical knife, tools that will remain fundamental to the medical art. Yet, in so doing, he does not presumably explain why the disease occurred and why his drugs are effective. It is the seer or the dream-interpreter who deals with the unseen causes of suffering by locating suffering in a broad, mortal-immortal social context.

In a fragment of the lost epic *The Sack of Ilion*, however, we find evidence of another perspective on the knowledge of the archaic healer. The fragment, which may date from the sixth or even the fifth century B.C., assigns the two major healers of the *Iliad*, Machaon and Podalirius, different skills.[21] The former has "defter hands," giving him the edge in removing missiles, cutting, and healing wounds. Podalirius, who is virtually invisible in the Homeric epics, is given a more prestigious skill, namely, the precise knowledge to know and to

cure mysterious diseases.[22] He is thus the first to recognize the signs of Ajax's madness—his flashing eyes and his disordered thought—after Ajax is denied the arms of Achilles. Unfortunately, we do not know how he responds to these signs in the epic.

If Podalirius's knowledge seems to diverge from the knowledge of the healers we have discussed thus far, this may be the result of our limited evidence from the archaic period. What is so intriguing about the *Sack of Ilion* fragment, however, is that its description of Podalirius neatly anticipates the persona who will come to dominate our earliest corpus of extant medical texts: the physician as the decipherer of corporeal signs. At the same time, whereas Podalirius in some way has a superior understanding of the changes to Ajax's eyes and thought, what distinguishes the physician in the later texts is his grasp of the nature of bodies and diseases. Let us turn to these texts now in order to see how the physical body (*sôma*) emerges as an object of knowledge and a site of technical intervention.

SEEING THE PHYSICAL BODY

"The nature of the body is the starting point of the medical *logos*," observes the author of the classical-era medical treatise *On Places in a Human Being*.[23] His observation builds on a number of assumptions that are crucial to the conceptualization of medicine in fifth- and fourth-century B.C. Greece: there is a thing called the body; it has a nature; and medicine should be based on an account (*logos*) of that nature. Our understanding of how these ideas take shape is unfortunately hampered by the absence of evidence for the early phases of naturalizing medicine. As a result, the rupture between the archaic *iatros* and his classical counterpart is exaggerated for us. Nevertheless, it is difficult to deny that the extant medical texts from the classical period represent a historical shift in how disease was viewed and the domain of the *iatros*. These texts offer explanations of disease from which the gods are systematically excluded as causes. Several of them launch attacks, sometimes virulent, on magico-religious etiologies, as in the opening pages of the treatise *On the Sacred Disease*.[24] In the place of the gods we find a roster of "natural causes," which, in many treatises, must be identified if the physician is to intervene successfully in the disease.

Rather than say that the medical writers "discovered" a timeless truth about human disease, namely that it is due to external (environmental, dietetic) factors and pathological processes inside the body, we might say that they gradually shape an object capable of assuming the causal power once ascribed to the gods: the *sôma*, in which and through which disease is now believed to take shape. Physicians and defenders of the medical *technê* are active participants in the public debates about human nature and the intellectual salons that flourish

in Athens and throughout the Greek world in the latter half of the fifth century.[25] By the fourth century B.C., many medical treatises are circulating, and the well-educated layperson is expected to be acquainted with the basic principles of medical accounts of the body, disease, and human nature.[26] The cultural saturation achieved by medicine in this period suggests that the body at the heart of the new medicine may have begun to influence, at least in some quarters of the Greek-speaking world, how embodiment was not only conceptualized but also experienced.

The emergence of the physical body owes much to the broader "inquiry into nature" in this period.[27] From Aristotle to present-day histories of philosophy, a triad of thinkers in sixth-century B.C. Asia Minor—Thales, Anaximenes, and Anaximander—have been celebrated for offering explanations of phenomena that were traditionally ascribed to Zeus (e.g., lightning) in terms of natural causes (water, air, the hot, and so on). Fifth-century "physicists," such as Empedocles and Anaxagoras, sought to explain phenomenal reality in terms of microscopic elements. These elements interact in an ongoing process of composition and dissolution driven by chance, necessity, and the nature of each element and compound, rather than by the intentions and emotions so crucial to the circulation of power in the divine world.[28]

One way of understanding the new medicine, then, is to see it as describing how persons are necessarily implicated in the impersonal cosmos being described by the physicists.[29] Most of the interactions humans have with this world-in-flux exist below the threshold of what we can sense of ourselves. Moreover, they happen automatically: although we may control the kinds of encounters we have with the external world by paying attention to our diet and our activities, our physical interaction with that world happens without our conscious participation. *Sôma* thus comes to designate the part of the person that participates mechanically in the physicists' cosmos.

The *sôma* does not simply participate in the larger physical world: it is also a microcosm of that world and subject to similar processes and exchanges. In the early fifth century B.C., Alcmaeon of Croton, said by a later doxographer to have written on "medical things," gives us our first extant naturalizing account of disease: he claims that it is caused by the excessive power of a single force among the many different forces (the hot, the cold, the bitter, the sweet, etc.) that together constitute the human body.[30] The idea that the body naturally comprises a number of potentially dangerous impersonal stuffs or humors—their number and characterization vary from author to author—proves a powerful one for the medical writers. Thus, while the disease process is catalyzed by a powerful influx of force from the environment, such as a change of temperature or a sharply bitter food, the chain reaction that eventually produces the symptom takes place within and by means of the body itself. The author of the late fifth-century treatise *On Ancient Medicine* nicely sums up what he

takes to be the discovery of the first physicians: "they saw that these things [i.e., the humors] are inside a human being and that they hurt him."[31]

Medicine responds to the specific vulnerability represented by the body qua unstable compound caught in an indifferent world by developing technologies to manage the fragility of human nature. As the passage just cited suggests, these technologies are founded first and foremost on the ability of the physician to look past the surface of the body to "see" into its physical substratum. For, as we have seen, much of what counts as *sôma* cannot immediately be felt, let alone understood by the embodied person. Nor does the physician have direct access to this hidden world, given what one author calls the "density" of the body.[32] Insofar as the body is a kind of "black box," whose interior is beyond investigation, the physician relies heavily on the symptom: "The vision of unseen things is through the phenomena," to quote a tag that is ascribed to Anaxagoras and could serve as the motto of the early medical writers.[33]

In magico-religious paradigms, too, corporeal phenomena provoke inferences about things unseen. No one—except, of course, Homer's audience—*sees* Apollo string his bow against the Achaean troops or the arrival of his arrows. His presence, rather, is inferred from the sudden onset of plague. And it is not just the god's presence that is inferred but also his anger and the reasons behind it. In a similar way, the medical writers understand a symptom as giving them access, first, to a hidden space populated not by anthropomorphic beings but by fluids and channels, hollows and bones.[34] Symptoms yield information, too, not about the reasons behind an intentional act of harming but about the forces that act in this space—humors, as well as the forces of life and death.

In the Hippocratic treatise *On Regimen in Acute Diseases*, for example, the author provides an explanation of why patients sometimes die with a mark on their flanks "as if a blow had been received."[35] Rather than blame the mark on demonic anger, the author claims that it is caused by a massed humor present in the body at the time of death. Although the patient had felt the humor as pain, it had not been seen—until now. Its materialization on the surface of the body represents the end of a series of events inside the body, catalyzed by the physician's ill-advised decision to administer gruel: "one bad thing is added to another," writes the author, until that "bad thing" has become powerful enough to cause the patient's death. Without concerning ourselves with the finer points of the pathological process envisioned here, let us use this example to highlight three ways in which a nascent medical semiotics helps to generate a concept of the physical body.

It is clear, first, that the writer believes that a symptom—first pain, then the mark—can bring a humor to the attention of both the patient and the physician. Pain, in other words, brings to light the presence of something that is usually part of us without us being aware of it.[36] The author of the treatise *On the Nature of a Human Being*, who is arguing, presumably in a public arena,

against those who say that a human being is made up of only one thing, points out that pain can be felt only by a body whose nature is not uniform: here, pain becomes a proof of our composite nature.[37] Elsewhere we find medical writers making more specific claims about our bodies (e.g., that winter fills the body with phlegm, that bodies are harmed not by gods but by diseases) that are also deemed proven through phenomenal signs.[38] Thus, it would seem that by the latter half of the fifth century B.C., physicians were inviting patients to "see" themselves first and foremost as composite, labile, and often disordered physical bodies, rather than as social agents capable of attracting the anger of gods and demons. Such a mode of "seeing" takes place primarily through symptoms.

Second, symptoms can provide more specific information about what is going on inside the body, information that allows the physician to intervene in the disease process. In the passage we just saw, the author interprets the visible mark on the body as the final moment in a chain of events inside the body that he reconstructs from the patient's symptoms (pain, rapid and heavy breathing, and so on). On other occasions, the physician uses symptoms in order to act. The surgical treatises are full of signs (*sêmeia*) that allow the healer to recognize the nature and location of a fracture or dislocation.[39] There are signs to know when a disease is "settled" and the patient can be purged.[40] The author of the treatise *On Regimen* boasts that he has developed a system of "pre-diagnosis" for identifying the onset of disease in the body far before "the healthy is conquered by the diseased."[41] In these instances, we see the physician trying to gain access to the underlying state of the body or events that have occurred there. The body is imagined as a space hiding the disease. Symptoms, correctly interpreted, can give the physician the edge in the race against the trouble developing inside the body.[42]

Finally, symptoms are used to predict the outcome of a patient's disease. Thus a corporeal sign may be good or bad depending on whether it forecasts recovery or death (or relapse). There are whole treatises (*On Prognostic*, *Prorrhetic* I and II) devoted to teaching the physician how to identify good and bad signs and to make his predictions accordingly. Often we are given very little indication as to why a sign is believed to be positive or negative, an omission that once led scholars to believe that the prognostic treatises represented the accumulation of collective empirical observation. No doubt some of the prognostic signs have a basis in experience: the *facies Hippocratica* is still held to be a reliable predictor of death. Yet careful work in recent decades has demonstrated that many of the signs deemed critical—that is, signs that occur at specific points in the disease and indicate in which direction it will turn—also have a basis in the theoretical and pretheoretical assumptions of humoral pathology and contemporary number theory.[43] How does prognostic interpretation imagine the body? Whereas the signs we have seen thus far are used to prove a point

about the body's nature, to shed light on its present condition, or to indicate a specific event inside the body, prognostic signs are held to be signs "of the whole body."[44] A "good" sign indicates the body's strength; its life force; or, as it is sometimes represented, its inner heat.[45] A bad sign, conversely, signifies the ascendancy of the disease. Prognostic symptoms thus help to represent the body as governed by a kind of life force that maintains the cohesion of the composite body and defends it against external forces.

Here, then, are three things that symptoms in the medical treatises enable physicians to "see," thereby encouraging the crystallization of the concept of the physical body: the person's composite nature; his hidden inner depths, where disease forms; and a nonconscious, automatic principle of life. This picture is necessarily schematic. Yet it does give us the basic blocks with which to build an overview of how concepts of the physical body morph and multiply in the following centuries under the influence of competing ideas about what the physician can and should know and do. I take up each of these aspects now in turn. I begin with the idea that bodies are unstable compounds requiring management. I then trace briefly how the idea of a principle of life develops, before considering how the desire to *see* the hidden life of the body gives rise to systematic human dissection; I examine, too, the powerful challenges to the idea that medicine requires knowledge of the unseen, which begin to appear in the Hellenistic period. After revisiting the concept of the body as an object of care in the imperial period, I close with a look at Galen and the formation of Galenism.

CARE OF THE BODY AND CARE OF THE SELF

A distinguishing feature of medicine in the late fifth and early fourth centuries B.C. is its prominence in the broader cultural and intellectual sphere. Physicians are not engaged in disinterested research on the nature of the body. Rather, they are actively debating its characteristics and trying to persuade general audiences and patients to interpret symptoms—both their own and those of others—through the lens of specific medical explanations: rhetoric is an indispensable tool to the rise of the new medicine.[46] Laypersons are being encouraged to educate themselves in the basic principles of medicine.[47] After all, if the body is a source of vulnerability, it is in the interests of those most vested in maintaining control over themselves and others—namely adult freeborn men—to care for their bodies.[48]

It is against this backdrop that we should imagine the rise of dietetics, as well as a particular kind of "technical" gymnastic training—both practices designed to ward off disorder in the body and to shape its external appearance.[49] The most extensive extant treatise on these subjects, *On Regimen*, is typically dated to 400 B.C., but its author refers to many earlier writings on the subject.[50]

The treatise sheds light on the growing sophistication of a kind of quotidian, prophylactic care that the author presents not only to an elite audience but also to an audience of people who cannot afford to take care of their health "at the expense of everything else."[51] Its premise is the necessity of protecting the composite body—for this author a mixture of fire and water—against seasonal changes and other possible catalysts of disease. Its strategy turns on the patient's constant adjustment of the body's economy of forces through diet and exercise, as well as on his monitoring of the body for the first signs of trouble. Lack of care, *ameleia*, is playing with high stakes. For, it is on the physical composition of the body and the soul that not only health but also intelligence and character depend.[52] Despite the fact that our evidence for the middle and later fourth century B.C. is fragmentary, it appears that the management of the body within a broadly humoral context becomes increasingly precise in these decades. An extensive excerpt from the works on regimen by one of the leading physicians of this period, Diocles of Carystus, outlines an almost hour-by-hour regimen for patients interested in maximizing health.[53]

At the same time, we also have evidence of resistance to the "excessive care of the body." In the third book of Plato's *Republic*, Socrates attacks modern medicine for enabling people to cling to worthless lives. Not only does medicine preserve those who, having turned their bodies into "stagnant swamps," would be better off dead,[54] Socrates alleges; it also ruins perfectly happy lives. For "the excessive care of the body . . . makes any sort of learning, thought, or private meditation difficult, by forever causing imaginary headaches or dizziness and accusing philosophy of causing them . . . it is constantly making you imagine that you are ill and never lets you stop agonizing about your body."[55]

Socrates's complaint here is part of a challenge to medicine's therapeutic authority by those advocating what begins to be called, already in the fifth century B.C., a "care of the soul." The therapies of the soul are established both on analogy with the care of the body and in competition with it.[56] For Plato's Socrates, it is because medicine does not treat the soul, the font of untrammeled appetites and false beliefs, that it can only prop up unlivable lives instead of fostering true human flourishing through the cultivation of reason and the disciplining of emotions. It is likely that the idea of a soul somehow separate from and yet analogous to the body helped to crystallize a concept of the body as not-person. In Plato's early Socratic dialogues, as well as in later dialogues such as the *Phaedo*, he approaches the body as a mere instrument or something alien to our true nature.[57] At the same time, contrary to what the cliché of Platonic dualism would lead one to expect, it is possible to see the physical body becoming more and more entangled in Plato's concept of the soul. By late dialogues such as the *Timaeus*, the *Laws*, and the *Philebus*, the body is sufficiently implicated in the soul and critical enough to our

ethical health that it is the province of philosophy, not medicine, to manage the turbulence of embodiment.[58]

Aristotle sets out to establish a strong division between ethics, on the one hand, and biological and physiological investigation, on the other. Nevertheless, he, too, is fascinated with the gray zone of the psycho-physiological (e.g., dreams, perception, melancholy), and the medical analogy is a staple of the ethical treatises.[59] The analogy, which makes the soul the object of ethical therapy, grows extremely popular in the Hellenistic philosophical schools.[60] Yet, as we will see further in Galen, neither the separation of ethics and medicine nor the supremacy of the former is ever fully secured. Medicine's ambitions to describe the nature of a *human being* (and not just a body) never disappear. Indeed, its resources for doing so grow increasingly sophisticated in the Hellenistic period.

HELLENISTIC REVELATIONS: THE LIFE OF THE BODY AND THE TRUTH OF THE CORPSE

The growth of dietetics and the concomitant development of ethics qua therapy of the soul indicate popular fascination with the models of embodied selfhood generated by medical inquiry. They also point to a burgeoning interest in the functions and the structure of the healthy body in the fourth century B.C. For example, Aristotle and Diocles of Carystus dissect animals in the interests of creating an analogical model of the human body.[61] In so doing, they are building on their predecessors' interest in the body's inner structures (*schemata*),[62] as well as its skeletal architecture. (The surgical works in the Hippocratic Corpus suggest that practitioners had considerable success treating dislocations and fractures, and their procedures remained standard for centuries.) But for Aristotle, and perhaps for Diocles, too, describing the human body was not simply about description. A model of the body should also capture the relationship between the structure of each part and its function vis-à-vis the organism as a whole. It should, that is, be formulated from a teleological perspective.[63]

Both Aristotle and Diocles also appear curious (if somewhat mystified) about a basic principle of life, which seems to take the form of an inner, vital heat that enables the body to triumph over external threats (e.g., in digestion) and, in Aristotle at least, over the formlessness of matter.[64] Of equally hazy importance to life is *pneuma*, "breath" or "air," which will become a major player in Hellenistic accounts of the soul and the body. In Aristotle, *pneuma* may communicate sensory information to the "ruling part" (*hêgemonikon*) of the soul, which he consequentially located in the heart; *pneuma* also apparently translates the desires of this part into voluntary motion.[65] The evidence for the role of *pneuma* in Aristotle, however, is hardly overwhelming; we have scarcely more evidence for *pneuma* in Diocles.[66] Nevertheless, what we have

provides a glimpse of the significant role that *pneuma* will play in Hellenistic theories of sensation and voluntary motion.

The interests of fourth-century B.C. writers in the traffic between body and soul and the movement of life through the body were encouraged by their anatomical investigations. Animal dissection enabled investigators to see a complexly networked body where the earlier medical writers had imagined a vague system of channels for the circulation of humors. Praxagoras of Cos, working in the latter part of the fourth century B.C., is often credited with first differentiating arteries and veins, which had been previously lumped together under the term *phlebes*.[67] For Praxagoras, the difference concerned the substance transmitted: nutrient-rich blood for veins, *pneuma* for arteries. He also seems to have made the *neura*, "sinews" from Homeric times, outgrowths of the arteries, thereby creating a connection between the *pneuma* in the arteries and voluntary motion.[68] *Pneuma*, it would seem, thus comes to play a pivotal role in Praxagoras's understanding of the dynamics of human life. His conceptualization of the pneumatic body will prove particularly influential for the Stoics.[69]

Praxagoras's other major contribution to the Greco-Roman medical tradition is his claim that the regular contraction and dilation of the *pneuma*-bearing arteries can be sensed in the pulse. Although hitherto noticed only as a pathological sign (tremors, palpitations), the pulse becomes for Praxagoras a powerful index of health and disease in the body as a whole. He thus lays the groundwork for "sphygmology," a science of the pulse, which takes hold as a highly subtle diagnostic tool that puts the physician in direct, that is, haptic, contact with the vital forces of the patient.[70]

The advent of systematic human dissection in third-century B.C. Alexandria takes Praxagoras's inquiries into the networked body to a new level of complexity. The manipulation of the human corpse had been, until this point, taboo throughout the Greek world. Why the practice became possible at the court of the Ptolemies in Egypt is a matter of speculation, although one important factor was no doubt the royal sanction of the practice (the Ptolemaic court supplied the bodies of condemned criminals).[71] More certain is the powerful impact of anatomical investigation on the concept of the physical body. So powerful has this impact been that, whereas the humoral body appears a relic of the past, the anatomical body, that is, the *seen* body, often simply *is* "the" body for us, even today. Yet, as Shigehisa Kuriyama has argued, the Greek "anatomical urge" appears less inevitable in cross-cultural perspective. He attributes this urge to a cultural tradition that equates knowing with seeing, a tradition that, as we have seen, is integral to establishing medicine in the classical period as a privileged kind of insight into the inner body.[72] Rebecca Flemming and Phillipa Lang have further implicated anatomical inquiry, which would have been coded as a specifically Greek practice in the bicultural world of Hellenistic Alexandria, in Ptolemaic cultural imperialism.[73]

Dissection discloses a new world. Herophilus of Chalcedon, one of the most celebrated anatomists working at Alexandria, painstakingly details the inner landscape of the physical body, pointing out, in the process, structures that still bear the illustrative names he gave them.[74] Through repeated dissections, he charts the paths of the arteries and veins and offers further support to the perceived diagnostic usefulness of the pulse by relating it to the natural dilation and contraction of the arteries in all living beings.[75] Herophilus also isolates the nerves and traces their origin to the brain, in which he locates the ruling part of the soul; he seems to have further distinguished "voluntary" nerves (for motion) from sensory nerves.[76] There is strong evidence that the desire to see this intricate system encouraged Herophilus and other Alexandrian anatomists to vivisect not only animals but also criminals furnished by the Ptolemaic court.[77] The practice generated debates well into the imperial period about the costs of medical knowledge and the very feasibility of seeing life through the exposure of "the parts that nature had previously hidden" to the light.[78]

The challenge posed by anatomical investigation to a humoral, primarily fluid model of the body, which is dynamic first and foremost in the shifting nature of its composition, was first articulated in detail by Herophilus's controversial contemporary, Erasistratus of Ceos. Unlike Praxagoras and Herophilus, both of whom seem to have retained the basic tenets of humoral pathology, Erasistratus explains disease as the malfunctioning of those conduits that had come to dominate the physician's field of vision: arteries, veins, and nerves. Rather than describe disease in terms of the delicate humoral economy of forces, he attributes fevers and inflammations to a single event: the leakage of blood from the veins into the arteries, either through a cut or through an excess of blood in the veins.[79] The systematization of these new theories of pathology works in tandem with Erasistratus's formulation of a physiology in which health depends on the integrity of "elastico-fluid" systems.

To speak in terms of "elastico-fluid" systems, as the historian of medicine Mario Vegetti does, gives some indication of the influence of contemporary mechanical models on the Erasistratean conceptualization of the body.[80] According to Erasistratus, what is happening when blood from a vein enters a severed artery, for example, is the natural rush of fluids toward a vacuum, in this case created by the escape of *pneuma* from the artery. Erasistratus relies heavily on this biophysical principle in his explanation of normal physiological processes as well.[81] The fragments are full of analogies between machines and body parts, bodily processes and the mechanisms of Hellenistic pneumatics, hydraulics, and hydrostatics.[82] It is true that technological analogies can be found in our earliest biological and physiological writings.[83] With Erasistratus's analogies, however, the mechanical principles have grown more sophisticated (with a correspondingly complex explanation of bodily processes). Moreover, such analogies may have become provocative, if we understand the

greater attention being paid in the fourth century B.C. to the body's innate tendency toward life as creating a framework in which mechanistic explanation is seen as incompatible with vitalist principles: Galen, at any rate, will oppose approaches that he sees as strictly mechanical to his own teleological vitalism.[84] Erasistratus's own position, however, may have been more nuanced. He seems to have held not only the idea that life processes can be elucidated on analogy with machines but also the idea that the body is naturally equipped for the functions required for its flourishing.[85] Whether he saw a contradiction between these ideas or how he might have dealt with it are not questions the fragments allow us to answer.

CHALLENGES TO "THE VISION OF UNSEEN THINGS"

Erasistratus's own version of the Hellenistic fascination with the various (vascular, sensory, motor) webbed systems in the body prominently featured something he called the "*triplokia*," a braided bundle of arteries, veins, and nerves that constitutes the fabric of the body.[86] A distinguishing feature of the *triplokia* is that it is invisible to the naked eye. It is thus representative of a new class of unseen things produced by anatomical inquiry.[87] For, the more of the body that dissection reveals, the more is thought to lie below the surface of the visible. The evidence for Herophilus suggests a cautious thinker who drew back from speculation about the unseen substratum of the anatomical surface, whether in the form of microscopic structures or causal mechanisms and forces.[88] Yet, Erasistratus, for example, and, in the second century B.C., the physician Asclepiades of Bithynia, were more than willing to speculate about a new class of "things seen by reason." For Erasistratus, these include not only the *triplokia* but also the minuscule valves that allow blood to spill over into the arteries in cases of plethora; for Asclepiades, *onkoi*, tiny, featureless particles that circulate in tiny channels through the body.[89]

Speculation about the unseen strata of the physical body through inferential and analogical reasoning had been, as we have seen, a venerable practice in naturalizing medicine. In the Hellenistic period, however, resistance to the very idea that the physician can know such unseen things (conditions, mechanisms, causes) springs up, perhaps in response to the new set of unseen causes and structures created by anatomical investigation, perhaps in response to the practice of anatomy itself. Physicians and medical writers had always been a contentious group. Yet the challenge to medicine's quest for hidden causes appears to have created at some point in the third century B.C. a formal school of "Empiricists," headed by a renegade student of Herophilus, Philinus of Cos.[90] The emergence of the Empiricists initiates a period in which the learned medical tradition is fragmented into different sects.

The Empiricists hold that the knowledge relevant to clinical success requires no training in the principles of the body's organization or functioning. Rather, the physician can glean everything he needs to know from his own experience, from reading case histories written up by others, and by making educated guesses on the basis of similar cases in the past. Those physicians against whom the Empiricists define themselves never form a coherent group. Nevertheless, by the Roman imperial period they are identified collectively as Dogmatists or Rationalists. In the early decades of the first century A.D. in Rome, another school opposed to the search for hidden causes takes shape: the Methodists. The Methodists hold that any pathological condition of the body falls into one of three general categories—looseness, tightness, or a mixture of the two.[91] The physician need only identify the condition (or "community") to know the proper therapy: one of Methodism's major exponents, Thessalus of Thralles, declared that anyone could learn medicine in a mere six months.[92]

The debates among the sects bear primarily on epistemological questions, and a detailed account of their differences would take us too far afield. What we can observe, however, is how these new sects redraw the lines of the medical body.[93] For both the Empiricist and the Methodist, the symptom no longer indicates hidden events, forces, or conditions inside the body. The Empiricist draws a direct line, rather, between the corporeal phenomenon and a therapeutic response (rather than an internal event or condition) on the basis of previous successes and failures. For the Methodist, inferential reasoning is unnecessary insofar as each of the three possible pathological conditions of the body can be apprehended directly by the senses. Given the immediate transparency of the body, the Methodists had little use for anatomy. Empiricists were equally dismissive of the anatomist's expanded field of vision, arguing that the corpse can tell us nothing useful about the living body.[94] Both sects, then, challenge medicine's claim to arcane knowledge by putting the relevant facts about disease in the public domain, as it were, and radically curtailing the data relevant to diagnosis and treatment. The medical body is recast primarily as a body of surface phenomena and a body encountered at the bedside.

MANAGING THE BODY IN THE EARLY IMPERIAL PERIOD

The limits of our evidence make it difficult to know how anatomical inquiry and the sects' debates affected public perceptions of the body, particularly the body vulnerable to disease. The Alexandrian physicians are part of a larger intellectual community under the patronage of the Ptolemies, and Hellenistic poetry bears evidence of the poets' exposure to their colleagues' investigations. Apollonius, for example, incorporates corporeal objects generated by dissection into his description of the effects of Eros's arrow on Medea.[95] In

the Roman period, laypersons are evidently aware, and wary, of dissection practices (although systematic human dissection had been limited to Alexandria, where it ceased after just a few generations).[96] But laypersons can also be extremely knowledgeable about and interested in medicine: the Roman encyclopedist Celsus, for example, was deeply familiar with medical theories and practices, although he was almost certainly not a physician.

The fascination with all things medical, coupled with a deep distrust toward physicians, is characteristic of the reception of Greek medicine in the Roman world.[97] The doctoring of both family and slaves had been the task of the *paterfamilias*, and the old guard of the Roman Republic was not always amenable to the professionalization of healing at the hands of foreigners. According to Roman tradition, Archagathus, the first Greek *medicus* (and for the Romans, all *medici* were Greek), was driven out of Rome after being nicknamed "the executioner" for his harsh treatments.[98] Nevertheless, although we know little about the specific circumstances of the arrival of Greek medicine in Rome, it was undoubtedly prominent among the intellectual and cultural imports that flowed into Rome in the last centuries B.C. as Rome conquered the Greek-speaking world. The epistemological debates that dominated Alexandrian medicine were an integral part of the Hellenistic philosophical tradition to which Roman elites were exposed. Medical treatises were written for the general public, and Greek medical terminology and ideas made their way into a wide range of literary and other nonspecialist texts written in Latin from as early as the third century B.C. Greek doctors practiced both as slaves and as citizens in the highest echelons of Roman society. In spite of Roman resistance to Greek physicians, then, these doctors were in popular demand, and educated Romans commanded a sophisticated knowledge of medical theories and practices.

One of the consequences of the dissemination of medical ideas in everyday life was a preoccupation with the "care of the self" in the early centuries A.D., much as we saw was the case in the fourth century B.C. Despite radical changes to earlier concepts of the body in the Hellenistic period, the body taken as the object of the care, that is, as a fragile and labile composite organism in need of constant surveillance, remains familiar. Moreover, despite the debates between the medical sects about the limits of causal explanation, the relationship between behavior (diet, exercise) and health, so central to early Greek medicine (and of continued importance in the Hellenistic world),[99] remains robust enough in the Roman context to keep medicine intertwined with ethics. The body, in other words, continues to function as a tableau of one's way of life.[100]

For leisured Romans and Greeks in the first centuries A.D., then, the care of the body, informed by general medical ideas about healthy living (what and when to eat, when to bathe and how, and so on) was "a moral obligation."[101]

Texts such as Plutarch's treatise *Advice about Keeping Well*, written toward the end of the first century A.D., the letters of Seneca, and the correspondence between Marcus Aurelius and Fronto open a window onto a culture that scrutinized the body and was preoccupied with diet, bodily habits and practices, and corporeal phenomena.[102] The focus on the body parallels the emphasis in the Hellenistic and Roman philosophical schools on caring for the soul, and indeed body-care remains the model for soul-care.[103] There has been much speculation about the social and historical reasons for the "medicalization" of daily life and the sense of the body as something vulnerable and unstable. What is clear is the heightened attention to the physical body. Indeed, this awareness of the body's fragility may have impacted early Christian notions of the body as corrupt and terrestrial.[104]

The concept of the body as something highly sensitive to food, drink, and other influences appears, too, in the scattered testimonia we have from the supplicants of the healing god Asclepius. Our first evidence of the Asclepius cult dates from fifth-century B.C. Greece, although there is archaeological evidence of healing cults dating much further back. In early testimonia, Asclepius cures a wide range of ailments, from extended pregnancies to blindness to paralysis, for those who come to spend the night in his shrines.[105] Although the god sometimes cures with *pharmaka* in these accounts, he also heals with the touch of his hand (or the touch of his serpent or his sacred dogs) or by more violent and fantastical means: in one dream, for example, a mother dreams that the god cuts off her daughter's head and hangs her upside down, upon which a large quantity of fluid drains out of her body.[106] There is, however, increasing overlap between the care of the body advocated by human physicians and that recommended by the god as time goes on.[107] By the first centuries A.D., Asclepius often appears as a uniquely gifted personal physician. The Asclepieia in the large urban centers, particularly in the Greek East, were places where people gathered to compare symptoms and discuss current affairs, much as they did in nineteenth-century sanitoria.[108]

Our best source for this world is the rhetorician Aelius Aristides, who wrote of the god's benefaction in six books of *Sacred Tales* (of which five are extant). The *Sacred Tales* are full of detailed accounts of Aristides's maladies and his dreams.[109] Although he comes to Asclepius because the best physicians have failed to diagnose his illness, and although he exhibits a particular concern for bodily purity that challenges humoral notions of "relative health," the control that Aristides exercises over what goes in and out of the body (in consultation with his dreams) is consistent with the practices of body care in contemporary elite culture.[110] Of course, not every supplicant was a man of leisure, and Asclepius could intervene in a more pragmatic way when necessary.

We have followed over six hundred years the elaboration and transformation of the three ideas that I identified as critical to the crystallization of the

physical body in early medical writing: the concept of the physical body as an unstable compound; the concept of a substratum of the body wherein lie its inner truths; and the concept of a nonconscious principle of life. All these concerns (and many more) are taken up in the immense corpus of Galen of Pergamum (129–ca. 200/216 A.D.), whose own vision of medicine prevails for over a millennium. I turn now to a brief overview of Galen's perspectives on the body before closing with a brief look at medicine in the centuries after his death.

GALEN AND THE BODY

What makes Galen's legacy so daunting is both the range of his interests and his sometimes convoluted attempts to make his multiple perspectives converge on ostensibly unified objects. The son of a wealthy architect, Galen studied philosophy under representatives of the major schools of the day—Platonic, Peripatetic, Stoic, and Epicurean—and medicine at the great school in Alexandria, an education that no doubt played a role in his dual commitment to theory and experience. His first patients were gladiators. As his fame at Rome grew, he became the personal physician of emperors. From 162 A.D., he was active in the public medical demonstrations and debates popular in Rome, and he wrote prodigiously (we know of over 350 works). A product of a deeply competitive society, he was harsh toward critics and rivals and less than forthright about his affinities and his debts. He revered Hippocrates, whose true heir he believed himself to be.

It is probably Galen who codified the four humors of the body (blood, yellow bile, black bile, phlegm) that become canonical in later medicine. For, although he himself framed the quaternary schema as a Hippocratic legacy, only one extant treatise, *On the Nature of a Human Being*, works with such a model.[111] Yet Galen also recognizes, under the influence of Aristotle, four basic elements (fire, air, earth, water), which are represented in the body by humors, and four qualities (the hot, the cold, the dry, and the moist), which combine to form temperaments.[112] The humoral pathology transmitted under the name of Galen, then, takes on a particularly Aristotelian hue, which helps to ensure its viability in the Arabic, Byzantine, and Western Christian worlds, where Aristotelianism is deeply rooted. As in the earliest medical writings, health for Galen is a balance between the various constituent parts of the body. While ideal health is something of an illusion, a state according to nature (*kata physin*) is both possible and desirable.[113] The most perfect body was assumed to be male: females were by nature weaker, colder, and formed for the very tasks society held them to—above all childbearing.[114]

Galen's desire to recover a Hippocratic ideal—a desire that has its historical origins in the tradition of Hippocratic exegesis and lexicography that dates from Hellenistic Alexandria and undergoes a resurgence in the second century

A.D.[115]—should not, however, lead us to believe that he was retrograde in his interests or perspective. Well versed in anatomy as a result of his studies at Alexandria, he was engaged publicly and privately throughout his career in dissecting and vivisecting animals—he preferred Barbary apes and rhesus monkeys, since they were closest to human beings—in the interest of defending his claims about the body and seeking new information about its inner parts.[116] Galen championed a tripartite physiological system that he credited to another of his idealized ancestors, Plato, but that in truth owed much to the veins, arteries, and nerves of the Alexandrian body.[117] And anatomical knowledge facilitated Galen's surgical operations. These operations, in which Galen drew on a tradition that was at least half a millennium old and had flourished in the wake of anatomical investigation at Alexandria,[118] could be highly complex.

Galen's commitment to anatomical investigation, together with his fondness for philosophical logic, located him among the "Dogmatists," who held that knowledge of the body's inner workings was necessary for the proper interpretation of symptoms. Indeed, Galen's extant writings abound in examples of Galen as "medical detective," capable of discerning the hidden reality behind the morass of corporeal phenomena; attentive to every detail; practiced in pulse taking (he wrote thousands of pages on variations in the pulse).[119] Yet he was sympathetic, too, to the Empiricist program, as well as to empirical investigation; he was wary of generalization and deeply committed to clinical work. Knowledge of the body, on his view, originates with the experience of the body, and bodies themselves are required to confirm or refute conjectures.[120] Galen thus proudly refused membership in both the Dogmatist and the Empiricist sects—he was scornful of the Methodists, with their disregard for medical knowledge and training—and believed that he was in a position to profit from the advantages of each. His sustained emphasis on the regularities of the body and nature, on the one hand, and the importance of empirical inquiry, epistemic flexibility, and contingency, on the other, conjure up a body that both upholds an ordered vision of the world and challenges overly schematic models.

The idea of the ordered body was, in fact, one of Galen's deepest-held beliefs. Whereas scholars have shown that the teleology of Aristotle and later Peripatetics is sometimes nuanced or hesitant,[121] Galen is an enthusiastic and polemical teleologist. He is eager to demonstrate that every part of the human body is designed for a given purpose by a beneficent creator.[122] He is allergic to explanations that he sees as mechanistic—that is, as based on biophysical principles, rather than on innate, end-directed faculties—and quick to criticize those who fail to uphold a view of nature as purposive: Erasistratus and the Erasistrateans regularly come in for attack on these grounds. Galen's trust in a kindly demiurge commits him to the view that the body itself represents the best possible ordering of matter, which, as in Plato, preexists and at times

escapes the formal work of the creator. As a result, he in no way demonizes the body, as do the neo-Platonists and the early Christians, and he refuses to accept the idea of a god who can overrule the laws of nature with his mere intention, such as the god of the Judaic and Christian traditions.[123]

Despite his Platonism, Galen could never bring himself to understand the soul as something incorporeal, as contemporary Platonists argued, and he remained throughout his life professedly agnostic about its nature. Evidence abounds, however, for his belief in the interaction between the mind and the body. Galen held that one's physiological constitution determined character, thereby laying the groundwork for medieval ideas about character in both the Arab world and the Latin West, and he advanced explanations of psychic disease in bodily terms.[124] Galen was also a firm advocate of regimen and dietetics as enterprises that could strengthen character. What Galen did believe about the soul, then, was in a materialist vein.

In a few pages, one can give only a few indications of Galen's major positions and his relationship to his contemporaries. Yet such a sketch is useful not only because Galen was clearly a giant in his own age but also because he became the gatekeeper to the Greek medical tradition for later centuries. I close with a brief look at the fate of his writings and their impact on ideas about the body in subsequent generations.

LATE ANTIQUITY

We are ill informed about medicine in the century following Galen's death.[125] When our evidence thickens midway through the next century, it becomes clear that the longevity of Greek medical views on the body in general, and of Galen's views in particular, is due to the flourishing of the medical school at Alexandria from the fourth through the seventh centuries A.D. For in Alexandria lay the roots of the Byzantine and Arabic medical traditions, which championed Galen long before he was taken up as a master in the Latin West in the eleventh and twelfth centuries. One of the distinguishing features of the Alexandrian school was the rigid division between theory and practice.[126] I adopt it here to discuss first the learned tradition, then the more pragmatic legacy of Greek medicine.

Alexandria was, in late antiquity, a center of medical learning. Yet the tradition of anatomical inquiry had yielded to a primarily philosophical and nonexperimental approach to understanding the body, an approach that took to heart Galen's emphasis on the logical and theoretical foundations of medicine.[127] The body envisioned was very much the Galenic body, comprising four humors—themselves based on the four Aristotelian elements—and four basic qualities, as well as a tripartite system of life pegged to the brain, the heart, and the liver.

Health was seen as a successful equilibrium achieved within the inner mixture and sustained through its relations with the world around it. Galen was placed on the same footing as Plato and Aristotle, a position that reflects the integration of medicine into a broad program of natural philosophy. His work was the subject of commentaries and lectures that, at least during the tenure of one of Alexandria's most famous iatrosophists ("medical rhetoricians"), Magnus of Nisibis, people flocked from overseas to hear.[128] Galen's writings, which the Alexandrians judiciously narrowed down to sixteen core tracts, formed the basis of the medical curriculum and the prism through which the earlier Hippocratic writings were viewed.[129]

Galen's views on the body were disseminated, too, through the encyclopedias of medical theory that began to be compiled from earlier literature in the fourth century A.D. for a general educated public. Not all the extracts in these encyclopedias, such as those by Aëtius of Amida (first half of the sixth century A.D.) and Paul of Aegina (first half of the seventh century A.D.), are from Galen. Yet it is Galen who dominates the first of these compilations, written by Oribasius of Pergamum, a fourth-century A.D. product of the Alexandrian medical school who worked under the patronage of the Emperor Julian. And it is primarily Galen's word, decontextualized and repurposed, that prevails in later centuries.[130]

The gradual process by which Galen was winnowed down, abridged, and codified eventually produces, in place of an author, a medical philosophy: Galenism. After the Arab conquest of Alexandria in 642 A.D., Galenism, coupled with the Aristotelianism that had thrived alongside neo-Platonism in Alexandria, finds its natural home, first, among Christian Syrian physicians, who, from the sixth century A.D., had begun to translate the Alexandrian medical syllabus into Syriac; then among the educated elite of the Arab world, who prized Greek medicine alongside Greek philosophy, mathematics, and astronomy, placing it front and center of the gentleman's education, as had been the case in both classical Greece and imperial Rome. Galen was thus translated yet again, this time into Arabic. As a result, ideas about the importance of diet or the environment on health, for example, and the principles of humoral pathology lived on. The strong interest of Arabic culture in physiognomy, the practice of inferring character from physical traits, gave even greater weight to Galen's attempts to correlate psychological and ethical characteristics with physiology.[131] At the same time, Galen himself occasionally came under attack by independent-minded thinkers, such as Muhammad ibn Zakariya' ar-Razi (known in the Latin West as Rhazes), who taught medicine and had an active clinical practice in ninth- and early tenth-century A.D. Baghdad, and Aristotelians defending their master in matters where Galen had disagreed with him.[132] Commentaries on the core Galenic texts of the Alexandrian medical school

were also produced in Latin in sixth- and seventh-century A.D. Ravenna, a Byzantine center. Nevertheless, it is through the Arabic translations that Galenism comes to have a significant impact on the Latin West in the Middle Ages.

By the fourth century A.D., Christianity had succeeded in becoming institutionalized in the Roman Empire, and there was ample room for tension between medical views of the body and those fostered by the state religion. Galen's materialist views on the soul were a source of dismay to his later Christian admirers.[133] Prominent physicians were among the last public intellectuals to recant paganism, and they could get into trouble for their commitment to natural causality, which always threatened to encroach on divine territory.[134] More benignly, the dismissal of demonic causality by some physicians—others were quite willing to accept that demons may be at fault for an illness[135]—could simply be viewed as misinformed.[136] The debasement of bodily life in Christian ascetic traditions appears strikingly at odds with the practices of body-care underwritten by the broadly accessible medical ideas that we have seen.[137] Yet, in many respects, Christian authorities and intellectuals seem to have accommodated the practice of Greek medicine, whose knowledge and *materia medica* could be attributed to God's grace. They could find, too, strategic points of overlap, between Galen's divine demiurge, for example, and their own creator. In any event, apart from ascetic communities, most people, presumably, would have been open to a variety of practitioners and approaches in the pragmatic interest of a cure.

There was no doubt a good deal of continuity between the body concepts (medical or magico-religious) that had been the norm in the pagan Empire and those of the Christian world. In fact, given the limits of our knowledge of folk medicine and the physicians working outside of, or on the margins of, learned traditions,[138] it is difficult to know for certain how deep an impact the naturalized body had made in the centuries of Greco-Roman antiquity. In many quarters, a body defined in terms of physical elements or material life forces would have always coexisted with an embodied person open to malign intentions and demonic agents.[139] Moreover, the body being described by learned medicine was not always the body assumed by local physicians: Aulus Gellius reports some educated Romans discovering a physician in Attica who does not know the distinction between veins and arteries.[140]

Nevertheless, it does appear that in the wake of the social unrest of the third century A.D. and the split within the Empire in 364 A.D., there are fewer physicians treating suffering within the framework of the physical body, at least in the Western part of the empire, and people were left increasingly to their own devices.[141] After the seventh century A.D., the situation in the Byzantine world may have been similar. It is unsurprising, then, that the compendia of previous medical writings mentioned previously encompassed not only the genre of carefully organized theoretical positions, as represented by authors like Oriba-

sius, but also useful collections of recipes. Herein lies much of the pragmatic heritage of the learned tradition, which had itself always borrowed freely from older and parallel healing traditions. From the Hippocratic medical writings to the magisterial five-book *On Materia medica*, written in the first century A.D. by Pedanius Dioscorides of Anazarbus, to Galen's extensive research on animal and plant substances, pharmacology had been a theoretical enterprise founded on beliefs about the unseen powers of plants and the natural world as a whole.[142] Dioscorides, for example, organized his work according to a complex system of *dynameis*, "powers." Yet when his work was copied in later centuries, the theoretical framework was dispensed with—a similar fate befell Galen's pharmacological work, later conflated with Dioscorides's—and the material was reorganized alphabetically (and often with illustrations) for practical application: what mattered were results, rather than causes.

It is the body caught in a dynamic and complex web of natural causes that perhaps best captures the object of medical knowledge in Greco-Roman antiquity and the early medieval period, despite the challenges of the Empiricists and the Methodists. The complementary figure to this body is the knowing technical agent, who is capable of intervening in the body (and hence, in the person). He commands this power as a result of his knowledge, which is very often based on the claim to see beyond the corporeal surface to what is unseen. Knowledge of the physical body is thus imperative for survival and well-being, given the threats to the body from outside and its own inherent instability—a sentiment that will sound familiar in an age obsessed with expert advice about health. Indeed, it may be the familiarity of the physical body that keeps us from recognizing how it was not simply the notorious enemies of the body in the Western tradition, the Platos and the Descartes, who shaped the concepts of "the" body that have proved most tenacious. The very premise that the body is a physical thing, encompassing all that is somehow estranged from *the person* by virtue of its participation in nature and requiring expert medical care, has its roots in the learned Greco-Roman medical tradition.

49. Solon, the leading Athenian statesman of his time (chief magistrate in 594/3 B.C.E.), heard his nephew play a song of Sappho at a party and asked the boy to teach it to him, "so that," he said, "I may learn it and die" (Ael. *ap.* Stob. 3.29.58).
50. *Symp.* 191e.
51. Dover, *Greek Homosexuality,* 174.
52. *P. Oxy.* 1800 frag. 1.
53. *Leg.* 636c.
54. K.J. Dover, "Two Women of Samos," in *The Sleep of Reason: Erotic Experience and Sexual Ethics in Ancient Greece and Rome,* ed. M.C. Nussbaum and J. Sihvola, 222–28 (Chicago: University of Chicago Press, 2002), 226.
55. Suet. *Calig.* 36.1.
56. *Ep.* 95.21.
57. See, e.g., Hor. *Sat.* 2.5; Juv. 1 and 3; cf. Trimalchio in Petronius's *Satyricon.*
58. The speaker in Juvenal's third satire observes that the cruelest thing about wretched poverty itself is that "it makes human beings ridiculous" (152–53).
59. J.P. Hallett, "Women as Same and Other in Classical Roman Elite," *Helios* 16 (1989): 59–78.
60. J.H.W.G. Liebeschuetz, *Continuity and Change in Roman Religion* (Oxford: Clarendon Press, 1979), 45–47, with reference to Catull. 68.41–160.
61. Hor. *Carm.* 3.6.17–44.
62. C. Edwards, *The Politics of Immorality in Ancient Rome* (Cambridge: Cambridge University Press, 1993), 52–53.
63. It is reaffirmed in the emperor Justinian's sixth-century C.E. compilation of Roman law, the *Institutes* (4.18.4), where capital punishment is stipulated for homoeroticism and adultery, and confiscation of property or corporeal punishment and banishment (the penalty depending on rank) for seduction of an unmarried girl or widow.
64. *Dig.* 48.51.6 (Papinian); 50.16.101. pr. (Modestinus).
65. *Dig.* 48.5.13 (Ulpian).
66. C.A. Williams, *Roman Homosexuality: Ideologies of Masculinity in Classical Antiquity* (New York: Oxford University Press, 1999), 96; cf. E. Fantham, "*Stuprum*: Public Attitudes and Penalties for Sexual Offences in Republican Rome," *Échos du Monde Classique/Classical Views* 35 n.s. 10 (1991): 267–91.
67. *Dig.* 47.10.15.15–23 (Ulpian).
68. *Dig.* 47.11.1.2 (Paulus).
69. *Cael.* 9–10.
70. Williams, *Roman Homosexuality,* 113–15.
71. Skinner, *Sexuality in Greek and Roman Culture,* 200.
72. Tac. *Ann.* 1.54.
73. C. Edwards, "Unspeakable Professions: Public Performance and Prostitution in Ancient Rome," in *Roman Sexualities,* ed. Hallett and Skinner, 66–95.

Chapter 4

1. Recent research has demonstrated just how powerful the placebo effect may be. For one attempt to explain the effect from the perspective of evolutionary biology, see N. Humphrey, "Great Expectations: The Evolutionary Psychology of Faith Healing and the Placebo Effect," in *The Mind Made Flesh: Essays from the Frontiers of*

Psychology and Evolution (Oxford: Oxford University Press, 2002), 255–85, with n. 2 for further bibliography.

2. For a more detailed account of how the physical body emerges as a "conceptual object" in the Greek world and a more in-depth discussion of Greek medicine in the classical period, see B. Holmes, *The Symptom and the Subject: The Emergence of the Physical Body in Ancient Greece* (Princeton, NJ: Princeton University Press, 2010).
3. We cannot, however, assume that medicine exercised the same kind of authority over popular ideas about the body in the ancient Greco-Roman world as it does today. See especially the remarks on "naturalization" in R. Flemming, *Medicine and the Making of Roman Women* (Oxford: Clarendon Press, 2000), 3–27.
4. In recognizing the virtual absence of divine and demonic causes from the learned medical tradition, I am making no claims about the writers' views of the gods *tout court*.
5. Vivian Nutton, "Healers in the Medical Marketplace: Towards a Social History of Graeco-Roman Medicine," in *Medicine and Society: Historical Essays,* ed. A. Wear (Cambridge: Cambridge University Press, 1992), 15–58. See also Vivian Nutton, "The Medical Meeting Place," in *Ancient Medicine in Its Socio-Cultural Context,* 2 vols., ed. P. van der Eijk, H.F.J. Horstmanshoff, and P. H. Schrijvers (Amsterdam: Rodopi, 1995), 3–25.
6. For a recent account of the dating of individual treatises, see J. Jouanna, *Hippocrates,* trans. M. DeBevoise (Baltimore: Johns Hopkins University Press, 1999), 373–416. On the formation of the Corpus, see W.D. Smith, *The Hippocratic Tradition* (Ithaca, NY: Cornell University Press, 1979), 177–246.
7. On the "Hippocratic Question" (i.e., which texts were written by the historical Hippocrates) and its demise, see G.E.R. Lloyd, "The Hippocratic Question," *Classical Quarterly* 25 (1975): 171–92, reprinted in G.E.R. Lloyd, *Methods and Problems in Greek Science* (Cambridge: Cambridge University Press, 1991), 194–223. In addition to the extant Hippocratic writings, our other major source for medical views on the body and disease in the classical period is the Meno Papyrus (English translation in W.H.S. Jones, *The Medical Writings of Anonymous Londinensis* [Cambridge: Cambridge University Press, 1947]). The text is probably based on a compilation of medical doctrines by one of Aristotle's students.
8. On the methods and pitfalls of medical history and historiography in the ancient Greco-Roman world, see the overview in P. van der Eijk, "Historical Awareness, Historiography, and Doxography in Greek and Roman Medicine," in *Ancient Histories of Medicine: Essays in Medical Doxography and Historiography in Classical Antiquity,* ed. P. van der Eijk (Leiden: Brill, 1999), 1–31.
9. Vivian Nutton, "Ancient Medicine: Asclepius Transformed," in *Science and Mathematics in Ancient Greek Culture,* ed. C.J. Tuplin and T.E. Rihll (Oxford: Oxford University Press, 2002), 48–49.
10. The claim that Homer does not have a concept of the unified body was made controversially by Bruno Snell in the first chapter of *The Discovery of the Mind: The Greek Origins of European Thought,* trans. T. Rosenmeyer (Oxford: Blackwell, 1953), 1–22. While Snell's argument has been challenged weakly on philological grounds, it has gained widespread acceptance, particularly as the revised claim that Homer recognizes multiple modes of embodiment. See M. Clarke, *Flesh and Spirit in the Songs of Homer* (Oxford: Clarendon Press, 1999), 115–19, and Holmes, *Symptom and Subject.*

11. Homer's anatomy, evident in his wound descriptions, has long impressed medical historians. For a contemporary look at the wounding scenes, see K.B. Saunders, "The Wounds in *Iliad* 13–16," *Classical Quarterly* 49 (1999): 345–63. On the symbolic dimension of wounding, see C.F. Salazar, *The Treatment of War Wounds in Graeco-Roman Antiquity* (Leiden: Brill, 2000), 127–58; B. Holmes, "The *Iliad*'s Economy of Pain," *Transactions of the American Philological Association* 137 (2007): 45–84.
12. Homer *Iliad* 3.23, 7.79, 18.161, 22.342, 23.169; *Odyssey* 11.53, 12.67, 24.187. But compare Hesiod *Works and Days* 539–40, where the *sôma* is indisputably alive. Note: I have used Loeb Classical Texts when available.
13. Homer *Odyssey* 17.383–85. On the healer as a craftsman, see O. Temkin, "Greek Medicine as Science and Craft," *Isis* 44 (1953): 213–25; H.F.J. Horstmanshoff, "The Ancient Physician: Craftsman or Scientist?" *Journal of the History of Medicine and Allied Sciences* 45 (1990): 176–97. On the gradual democratization of the medical craft, which opened up apprenticeship to those outside the family, see L. Dean-Jones, "Literacy and the Charlatan in Ancient Greek Medicine," in *Written Texts and the Rise of Literate Culture in Ancient Greece,* ed. H. Yunis (Cambridge: Cambridge University Press, 2003), 97–121. Although doctors continued to be itinerant, as the Hippocratic *Epidemics* attest, in the classical period it appears that cities would pay physicians a fee to practice in the city, thereby ensuring not free medical care for the citizens, but the on-call presence of a reputable physician (L. Cohn-Haft, *The Public Physicians of Ancient Greece* [Northampton, MA: Department of History, Smith College, 1956]).
14. Homer *Odyssey* 19.457, *Iliad* 11.623–39. See also Homer *Odyssey* 4.230–31: every Egyptian has experience with all kinds of healing drugs. Warriors, too, appear to have had basic knowledge of wound-care, as at *Iliad* 11.841–48, where Patroclus treats the arrow-wound of Eurypylus: see C. Mackie, "The Earliest Jason: What's in a Name?" *Greece and Rome* 48 (2001): 1–17.
15. See Homer *Iliad* 11.515, where the *iatros* is valued because he cuts out arrows and dresses wounds. See also Pindar *Pythian* 3.40–54, where the healer is credited with the ability to administer drugs, undertake surgery, and sing charms: the celebrated Indo-European linguist Émile Benveniste believed he had discovered here the tripartite medical doctrine of the Indo-Europeans (*Révue de l'histoire des religions* 130 [1945]: 5–12).
16. Homer *Iliad* 1.62–64.
17. Celsus *On Medicine* Proem 3-4.
18. Calchas anticipates the shadowy "healer-seers" (*iatromanteis*), who we begin to hear about in the seventh and sixth centuries B.C.: see Robert Parker, *Miasma: Pollution and Purification in Early Greek Religion* (Oxford: Clarendon Press, 1983), 209–12.
19. For Babylonian diagnosis, see N. Heeßel, "Diagnosis, Divination and Disease: Towards an Understanding of the *Rationale* behind the Babylonian *Diagnostic Handbook*," in *Magic and Rationality in Ancient Near Eastern and Graeco-Roman Medicine,* ed. H.F.J. Horstmanshoff and M. Stol (Leiden: Brill, 2004), 97–116, especially 108–10. For the correlation between gods and symptoms in the classical period, see *On the Sacred Disease* 4, in Émile Littré, *Œuvres complètes d'Hippocrate*, 10 vols. (Paris: Baillière, 1839–1861), vol. 6, 466–70; translation in W.H.S. Jones, trans., *Hippocrates,* vol. 2 (Cambridge, MA: Harvard University Press, 1923).

20. Disease as demonic or nebulously personified: e.g., Homer *Odyssey* 5.394–97; Hesiod *Works and Days* 100–105; [Hippocrates] *On the Sacred Disease* 4 (Littré 6.360–62), in Jones, *Hippocrates,* vol. 2.
21. See *The Sack of Ilion,* frag. 2, in M.L. West, *Greek Epic Fragments* (Cambridge, MA: Harvard University Press, 2003), 149. On the dating of the fragment, see M. Davies, *Epicorum Graecorum fragmenta* (Göttingen: Vandenhoek & Ruprecht, 1988), 3–6, 65, 77.
22. Compare [Hippocrates] *On Breaths* 1 (Littré 6.90), in Jones, *Hippocrates,* vol. 2, where laypersons can grasp matters of the body, but only the physician is an expert in matters of understanding. The manual training for surgery is classed as a matter of the body, while the knowledge of causes is presented as more difficult and prestigious.
23. [Hippocrates] *On Places in a Human Being* 2 (Littré 6.278), in P. Potter, trans., *Hippocrates,* vol. 8 (Cambridge, MA: Harvard University Press, 1995).
24. [Hippocrates] *On the Sacred Disease* 1–4, 14 (Littré 6.352-364, 380-82), in Jones, *Hippocrates,* vol. 2. See also [Hippocrates] *Airs, Waters, Places* 22 (Littré 2.76-82), in W.H.S. Jones, trans. *Hippocrates,* vol. 1 (Cambridge, MA: Harvard University Press, 1923).
25. On the intellectual climate of the latter half of the fifth century B.C., including the role of medicine within it, see Rosalind Thomas, *Herodotus in Context: Ethnography, Science and the Art of Persuasion* (Cambridge: Cambridge University Press, 2000), 1–27. For the geographical scope of the works in the Hippocratic Corpus, see Jouanna, *Hippocrates,* 25–36.
26. On the circulation of medical treatises: Xenophon *Memorabilia* 4.2.10.
27. See Holmes, *Symptom and Subject,* chap. 2.
28. For the triad chance, necessity, and nature: Plato *Laws* 10.889b–c.
29. Although many of the physicists took an active interest in biology and indeed in human nature, we can see medicine trying to stake out the ground of a materialist anthropology in *On Ancient Medicine* 1–2 (Littré 1.570-74), in Jones, *Hippocrates,* vol. 1.
30. Alcmaeon frag. 310 in G.S. Kirk, J.E. Raven, and M. Schofield, eds., *The Presocratic Philosophers: A Critical History with a Selection of Texts,* 2nd ed. (Cambridge: Cambridge University Press, 1983). For his work on "medical things," see Diogenes Laertius *The Lives of the Philosophers* 8.83.
31. [Hippocrates] *On Ancient Medicine* 14 (Littré 1.602), in Jones, *Hippocrates,* vol. 1.
32. [Hippocrates] *On the Art* 11 (Littré 6.20), in Jones, *Hippocrates,* vol. 1.
33. Anaxagoras frag. 510 in Kirk, Raven, and Schofield, *The Presocratic Philosophers.* The dictum, handed down by Sextus Empiricus (*Against the Mathematicians,* 7.140), was also sometimes attributed to Democritus.
34. An imaginative look at the inner body can be found in [Hippocrates] *On the Art* 10 (Littré 6.16-18), in Jones, *Hippocrates,* vol. 2.
35. [Hippocrates] *On Regimen in Acute Diseases* 17 (Littré 2.260-62), in Jones, *Hippocrates,* vol. 2.
36. [Hippocrates] *On Ancient Medicine* 14 (Littré 1.600-604), in Jones, *Hippocrates,* vol. 1.
37. [Hippocrates] *On the Nature of a Human Being* 2 (Littré 6.34), in W.H.S. Jones, trans. *Hippocrates,* vol. 1 (Cambridge, MA: Harvard University Press, 1931).
38. [Hippocrates] *On the Nature of a Human Being* 7 (Littré 6.46), in Jones, *Hippocrates,* vol. 4; [Hippocrates] *On the Sacred Disease* 14 (Littré 6.382), in Jones, *Hippocrates,* vol. 2.

39. [Hippocrates] *On Fractures* 42 (Littré 3.552), *On Joints* 19 (Littré 4.132), in E.T. Withington, trans., *Hippocrates,* vol. 3 (Cambridge, MA: Harvard University Press, 1928).
40. [Hippocrates] *Epidemics* V 64 (Littré 5.242), in W.D. Smith, trans., *Hippocrates,* vol. 7 (Cambridge, MA: Harvard University Press, 1994).
41. [Hippocrates] *On Regimen* I 2 (Littré 6.472), in Jones, *Hippocrates,* vol. 4.
42. For the "race" against the disease, see [Hippocrates] *On the Art* 11 (Littré 6.20-22), in Jones, *Hippocrates,* vol. 1.
43. V. Langholf, *Medical Theories in Hippocrates: Early Texts and the "Epidemics"* (Berlin: De Gruyter, 1990).
44. [Hippocrates] *Prognostic* 12 (Littré 2.42), in Jones, *Hippocrates,* vol. 2.
45. For evidence of the idea of inner or vital heat in the medical writers, see B. Gundert, "Soma and Psyche in Hippocratic Medicine," in *Psyche and Soma: Physicians and Metaphysicians on the Mind-Body Problem from Antiquity to Enlightenment,* ed. J.P. Wright and P. Potter (Oxford: Clarendon Press, 2000), 16–17. The equation of life and warmth is already formalized in pre-Socratics such as Parmenides and Empedocles. In the medical writers, as well as in Plato (*Timaeus* 78b–79a), heat is closely associated with the body's ability to "cook" or, more technically, "to concoct" humors: see Langholf, *Medical Theories,* 88–89; M. Schiefsky, *Hippocrates, On Ancient Medicine* (Leiden: Brill, 2005), 280–83.
46. See L. Edelstein, "Hippocratic Prognosis," in *Ancient Medicine: Selected Papers,* ed. O. Temkin and L. Temkin (Baltimore: Johns Hopkins University Press, 1967), 65–85; G.E.R. Lloyd, *Magic, Reason, and Experience: Studies in the Origin and Development of Greek Science* (Cambridge: Cambridge University Press, 1979), 86–125; P. van der Eijk, "Towards a Rhetoric of Ancient Scientific Discourse: Some Formal Characteristics of Greek Medical and Philosophical Texts (Hippocratic Corpus, Aristotle)," in *Grammar as Interpretation: Greek Literature in Its Linguistic Contexts,* ed. E. Bakker (Leiden: Brill, 1997), 77–129; J. Laskaris, *The Art Is Long: "On the Sacred Disease" and the Scientific Tradition* (Leiden: Brill, 2002).
47. [Hippocrates] *On Affections* 1 (Littré 6.208), in P. Potter, trans., *Hippocrates,* vol. 5 (Cambridge, MA: Harvard University Press, 1988). See also Plato *Laws* 4.720d–e.
48. On dietetics and the care of the self in this period, see M. Foucault, *History of Sexuality,* vol. 2, *The Use of Pleasure,* trans. R. Hurley (New York: Pantheon, 1985).
49. Greek athletics, of course, has strong roots in the archaic period, where it develops in a religious context. See T. Scanlon, *Eros and Greek Athletics* (New York: Oxford University Press, 2002). On the intersection of the sculpted body and classical Greek notions of health and the body, see S. Kuriyama, *The Expressiveness of the Body and the Divergence of Greek and Chinese Medicine* (New York: Zone, 1999), 134–43.
50. [Hippocrates] *On Regimen* I 1 (Littré 6.466), in Jones, *Hippocrates,* vol. 4.
51. [Hippocrates] *On Regimen* III 69 (Littré 6.604), in Jones, *Hippocrates,* vol. 4.
52. [Hippocrates] *On Regimen* I 35 (Littré 6.512-22), in Jones, *Hippocrates,* vol. 4.
53. Diocles of Carystus frag. 182 in P. van der Eijk, *Diocles of Carystus: A Collection of the Fragments with Translation and Commentary,* 2 vols. (Leiden: Brill, 2000–2001).
54. Plato *Republic* 3.405c–d.
55. Ibid., 3.407c. Translated by C.D.C. Reeve, *Plato, Republic* (Indianapolis: Hackett, 2004).

56. B. Holmes, "Body, Soul, and Medical Analogy in Plato," in *When Worlds Elide: Classics, Politics, Culture,* ed. J. P. Euben and K. Bassi (Lanham, MD: Rowman and Littlefield, forthcoming).
57. See, e.g., Plato *Alcibiades* I 130a–c; *Protagoras* 313a; *Phaedo* 114e.
58. On the close relationship of mind and body in the *Timaeus* and other later dialogues, see T. J. Tracy, *Physiological Theory and the Doctrine of the Mean in Plato and Aristotle* (The Hague: Mouton, 1969), 77–156; R. Sorabji, "The Mind-Body Relation in the Wake of Plato's *Timaeus,*" in *Plato's "Timaeus" as Cultural Icon,* ed. G. J. Reydams-Schils (Notre Dame, IN: University of Notre Dame Press, 2003), 152–62; G. R. Carone, "Mind and Body in Late Plato," *Archiv für Geschichte der Philosophie* 87 (2005): 227–69.
59. Aristotle was the son of a physician and saw medicine as an integral part of natural philosophy: *On Sense and the Sensible* 436a17–21; *On Respiration* 480b28–30. For Aristotle's work on psycho-physiological phenomena, see P. van der Eijk, *Medicine and Philosophy in Classical Antiquity: Doctors and Philosophers on Nature, Soul, Health and Disease* (Cambridge: Cambridge University Press, 2005), chap. 5–9. For the medical analogy in his ethics: W. Jaeger, "Aristotle's Use of Medicine as Model of Method in His Ethics," *Journal of Hellenic Studies* 77 (1957): 54–61; Tracy, *Physiological Theory,* 157–333.
60. M. Nussbaum, *The Therapy of Desire: Theory and Practice in Hellenistic Ethics* (Princeton, NJ: Princeton University Press, 1994).
61. In his zoological treatises, Aristotle occasionally refers to a book called *Anatomai,* which featured diagrams of dissected animals (e.g., *Generation of Animals* 719a9–10). On the need to construct the human body analogically: Aristotle *Parts of Animals* 644b1-16. For fragmentary evidence of the anatomical interests of Diocles of Carystus, see frag. 17–24c (van der Eijk).
62. Prior to Aristotle, however, anatomy was used primarily to prove specific claims rather than to provide an organized model of the body (J. M. Annoni and V. Barras, "La découpe du corps humain et ses justifications dans l'Antiquité," *Canadian Bulletin for Medical History* 10 [1993]: 202). For empirical investigation more generally in the Hippocratic writings, see Lloyd, *Magic, Reason, and Experience,* 146–69.
63. Aristotle, however, also recognized the limits of teleological explanation: see H. von Staden, "Teleology and Mechanism: Aristotelian Biology and Early Hellenistic Medicine," in W. Kullmann and S. Föllinger, eds., *Aristotelische Biologie* (Stuttgart: Steiner Verlag, 1997), 183–85, with further bibliography in n. 4. For evidence of Diocles' teleology, see frags. 23d and 31 (van der Eijk).
64. Heat as the triumph over formlessness: Aristotle *Generation of Animals* 732b26–733b16. The presence of heat for Aristotle is a key factor in differentiating male and female bodies, the latter being colder and thus less articulated: see L. Dean-Jones, *Women's Bodies in Classical Greek Science* (Oxford: Clarendon Press, 1994), 60–61. Diocles and vital or innate heat: frags. 31, 109 (van der Eijk). For the delicate relationship between vital heat and the soul in Plato and Aristotle, see F. Solmsen, "The Vital Heat, the Inborn Pneuma and the Aether," *Journal of Hellenic Studies* 77 (1957): 119–23. The Stoics identify the hot with the soul.
65. Transmission of perception: Aristotle *Generation of Animals* 743b37–744a5; 781a20–b5. Voluntary motion: Aristotle *On the Motion of Animals* 703a4-27. See further discussion of these passages in F. Solmsen, "Greek Philosophy and the Discovery of the Nerves," *Museum Helveticum* 18 (1961): 150–97, esp. 174–78. Aristotle's decision to locate the ruling part in the heart supported a long tradition

of cardiocentrism that persisted despite the anatomists' arguments, based on their studies of the nerves, for seeing the brain as hegemonic.

66. For *pneuma* in Diocles, see frags. 78, 80, 101, 107 (van der Eijk).
67. F. Steckerl, *The Fragments of Praxagoras of Cos and His School* (Leiden: Brill, 1958), 17.
68. Praxagoras of Cos frag. 11 (Steckerl).
69. In fact, the Stoics will use Praxagoras to reject further anatomical work on nerves and *pneuma:* see Solmsen, "Greek Philosophy," 195.
70. Praxagoras frags. 26–28 (Steckerl). Kuriyama (*Expressiveness of the Body,* 23–32) argues for a relationship between anatomical inquiry and the birth of the pulse.
71. Celsus *On Medicine* Proem 23–24. See L. Edelstein, "The History of Anatomy in Antiquity," in *Ancient Medicine*, ed. Temkin and Temkin, 274–81; H. von Staden, "The Discovery of the Body: Human Dissection and Its Cultural Contexts in Ancient Greece," *Yale Journal of Biology and Medicine* 65 (1992): 223–41.
72. Kuriyama, *Expressiveness of the Body,* 111–51.
73. R. Flemming, "Empires of Knowledge: Medicine and Health in the Hellenistic World," in *A Companion to the Hellenistic World,* ed. A. Erskine (Malden, MA: Blackwell, 2003), 451–53; P. Lang, "Medical and Ethnic Identities in Hellenistic Egypt," in *Re-inventions: Essays on Hellenistic and Early Roman Science,* special issue of *Apeiron* 37 (2004): 107–31.
74. Herophilus T 90-92, 96–99, 124 in H. von Staden, *Herophilus: The Art of Medicine in Early Alexandria* (Cambridge: Cambridge University Press, 1989).
75. On the pulse and its relationship to life: Herophilus T 144, 145a, 155, 164 (von Staden).
76. On the brain: Herophilus T 137–39 (von Staden). For voluntary nerves: T 81, 141 (von Staden). It is clear that Herophilus held that the nerves contained a kind of *pneuma;* it is less clear how he understood the relationship between this *pneuma* and the *pneuma* of the soul—there is no direct testimony for *pneuma* in the "voluntary nerves"—or the *pneuma* in the arteries: for discussion, see Solmsen, "Greek Philosophy," 185–88; H. von Staden, "Body, Soul, and Nerves: Epicurus, Herophilus, Erasistratus, the Stoics, and Galen," in *Psyche and Soma: Physicians and Metaphysicians on the Mind-Body Problem from Antiquity to Enlightenment,* ed. J. P. Wright and P. Potter (Oxford: Clarendon Press, 2000), 87–91.
77. For the evidence on vivisection, see esp. Celsus, *On Medicine* Proem 23–26 (T 63a von Staden) and Tertullian *On the Soul* 10.4 (T 66 von Staden); further evidence at T 63b–64b (von Staden). The evidence is judiciously discussed by von Staden (*Herophilus,* 141–53), who concludes that it is highly likely that vivisection was practiced on humans in this context.
78. Celsus *On Medicine* Proem 23–24.
79. Erasistratus of Cos frags. 158, 161–62, 240 in I. Garofalo, *Erasistrati fragmenta* (Pisa: Giardini, 1988).
80. M. Vegetti, "L'épistémologie d'Érasistrate et la technologie hellénistique," in *Ancient Medicine*, ed. van der Eijk, Horstmanshoff, and Schrijvers, 461–71; M. Vegetti, "Between Knowledge and Practice: Hellenistic Medicine," in *Western Medical Thought from Antiquity to the Middle Ages,* ed. M. D. Grmek, trans. A. Shugaar (Cambridge, MA: Harvard University Press, 1999), 72–103.
81. The principle was called "the following into that which is being emptied" (*hê pros to kenoumenon akolouthia*) and is widely thought to have been influenced by the views of Erasistratus's older contemporary Strato of Lampsacus on void.

82. H. von Staden, "Teleology and Mechanism," 199–203. See also H. von Staden, "Body and Machine: Interactions between Medicine, Mechanics, and Philosophy in Early Alexandria," in *Alexandria and Alexandrianism* (Malibu, CA: J. Paul Getty Museum, 1996), 85–106.
83. See, e.g., Empedocles frag. 471 in Kirk, Raven, and Schofield, *The Presocratic Philosophers*; [Hippocrates] *On Ancient Medicine* 22 (Littré 1.626-630; Jones, *Hippocrates,* vol. 1), where the author offers the principle that one can learn about concealed body parts and processes "through visible things outside the body," such as cupping glasses.
84. Vegetti ("Between Knowledge and Practice," 93) points out the rejection of Aristotle's principle of innate life-principles (*pneuma,* heat) among Hellenistic physicians. Galen's opposition of his own teleological vitalism to mechanism can be seen throughout the treatise *On the Natural Faculties* (translation in A. J. Brock, *Galen, On the Natural Faculties* [Cambridge, MA: Harvard University Press, 1916]).
85. Von Staden, "Teleology and Mechanism."
86. Erasistratus frag. 86 (Garofalo). According to Erasistratus, each strand carries its own substance—psychic *pneuma* in the nerves, vital *pneuma* in the arteries, and nutrient-rich blood in the veins—and has its own point of origin (the brain, the heart, and the liver, respectively).
87. Vegetti, "L'épistémologie d'Érasistrate."
88. R. J. Hankinson, "The Growth of Medical Empiricism," in *Knowledge and the Scholarly Medical Traditions,* ed. D. Bates (Cambridge: Cambridge University Press, 1995), 63–64.
89. On Asclepiades of Bithynia: J. Vallance, *The Lost Theory of Asclepiades of Bithynia* (Oxford: Oxford University Press, 1990); J. Vallance, "The Medical System of Asclepiades of Bithynia," *Aufstieg und Niedergang der Römischen Welt,* Band 2.37.1, Berlin, 1993, 693–727. The idea of things visible only to reason first occurs in fifth-century B.C. medical treatises: [Hippocrates] *On the Art* 11 (Littré 6.20) and *On Breaths* 3 (Littré 6.94), in Jones, *Hippocrates,* vol. 2.
90. See Galen's treatise *An Outline of Empiricism,* in M. Frede and R. Walzer, *Galen: Three Treatises on the Nature of Science* (Indianapolis: Hackett, 1985), 21–46. See also M. Frede, "The Ancient Empiricists," in *Essays in Ancient Philosophy* (Minneapolis: University of Minnesota Press, 1987), 243–60; Hankinson, "The Growth of Medical Empiricism." On the medical sects (*haireseis iatrikai*), see H. von Staden, "Hairesis and Heresy: The Case of the *Haireseis Iatrikai,*" in *Jewish and Christian Self-Definition,* vol. 3, *Self-Definition in the Graeco-Roman World,* ed. B. F. Meyer and E. P. Sanders (London: S.C.M., 1982), 76–100.
91. L. Edelstein, "The Methodists," in Temkin and Temkin, *Ancient Medicine,* 173–91; M. Frede, "The Method of the So-Called Methodical School of Medicine," in *Science and Speculation: Studies in Hellenistic Theory and Practice,* ed. J. Barnes et al. (Cambridge: Cambridge University Press, 1982), 1–23, reprinted in *Essays in Ancient Philosophy,* 261–78; Vivian Nutton, *Ancient Medicine* (London: Routledge, 2004), 187–201. There is now an edition of the fragments of the Methodists with English translations: M. Tecusan, *The Fragments of the Methodists,* 2 vols. (Leiden: Brill, 2004).
92. Another sect, the "Pneumatists," which formed in the first century A.D., should be mentioned here. Its adherents develop the idea that *pneuma* is the major principle of life, a position that allies them with the Stoic school of philosophy. Yet they also borrow from the other sects, fostering the growth of the eclecticism that is

systematized by Galen. For a brief overview of the Pneumatists, see Nutton, *Ancient Medicine,* 202–8.

93. Later perceptions of the sects are shaped by Galen's often biased account of them. At the same time, he plays a key role in establishing their importance in the Greek medical tradition as it is transmitted in the Byzantine, Arabic, and Latin worlds: his work *On the Sects for Beginners* (translated in Frede and Walzer, *Three Treatises*) was the first book read by medical students in Alexandria through the eighth century A.D.
94. Celsus *On Medicine* Proem 40–44.
95. Apollonius of Rhodes *Argonautica* 3.762–63.
96. On why systematic human dissection was so short-lived, see von Staden, *Herophilus,* 148–51. For evidence of public reactions to anatomical inquiry and vivisection, see G.B. Ferngren, "Roman Lay Attitudes towards Medical Experimentation," *Bulletin of the History of Medicine* 59 (1985): 495–505. For lay attitudes more generally: Vivian Nutton, "Murders and Miracles: Lay Attitudes to Medicine in Classical Antiquity," in *Patients and Practitioners: Lay Perceptions of Medicine in Pre-Industrial Society,* ed. R. Porter (Cambridge: Cambridge University Press, 1985), 23–53.
97. For an overview of the arrival of Greek medicine in Rome, see Nutton, *Ancient Medicine,* 157–70; Vivian Nutton, "Roman Medicine: Tradition, Confrontation, Assimilation," *Aufstieg und Niedergang der Römischen Welt,* Band 2.37.1, Berlin: De Gruyter, 1993, 49–78.
98. Pliny *Natural History* 29.6.12–15. The Roman moralist Cato the Elder claimed, according to Pliny, that Greek doctors had sworn an oath to kill foreigners by means of medicine.
99. For dietetic medicine in the Hellenistic period, see J. Scarborough, "Diphilus of Siphnos and Hellenistic Medical Dietetics," *Journal of the History of Medicine and Allied Sciences* 25 (1970): 194–201; W.D. Smith, "Erasistratus's Dietetic Medicine," *Bulletin of the History of Medicine* 56 (1982): 398–409.
100. Indeed, it may be in part because the ethics of body-care were so central to the cultural identity of Greek medicine that Greek physicians resisted an idea of contagion, which downplays individual responsibility: see Vivian Nutton, "The Seeds of Disease: An Explanation of Contagion and Infection from the Greeks to the Renaissance," *Medical History* 27 (1983): 1–34.
101. O. Temkin, *Galenism: Rise and Decline of a Medical Philosophy* (Ithaca, NY: Cornell University Press, 1973), 39.
102. See, e.g., Seneca *Letters to Lucilius* 54, 78. See G. Bowersock, *Greek Sophists in the Roman Empire* (Oxford: Clarendon Press, 1969), 69–73. For Seneca, see C. Edwards, "The Suffering Body: Philosophy and Pain in Seneca's *Letters,*" in *Constructions of the Classical Body,* ed. J.I. Porter (Ann Arbor: University of Michigan Press, 1999), 252–68.
103. Nussbaum, *The Therapy of Desire.* On the care of the self in this period, see M. Foucault, *History of Sexuality,* vol. 3, *The Care of the Self,* trans. R. Hurley (New York: Pantheon, 1986); P. Hadot, *Philosophy as a Way of Life: Spiritual Exercises from Socrates to Foucault,* trans. M. Chase (Cambridge, MA: Harvard University Press, 1995).
104. For a reading of the importance of the body in both pagan and Christian texts of the first centuries A.D., see J. Perkins, *The Suffering Self: Pain and Narrative Representation in the Early Christian Era* (London: Routledge, 1995).

105. See especially the account of a visit to Asclepius in Aristophanes's *Wealth* (633–747) and the late fourth-century B.C. testimonia from Epidaurus, T 423, in E. J. Edelstein and L. Edelstein, *Asclepius: Collection and Interpretation of the Testimonies,* 2 vols. (Baltimore: Johns Hopkins University Press, 1945). A fuller edition of the Epidaurian tablets may be found in L. R. LiDonnici, *The Epidaurian Miracle Inscriptions: Text, Translation, and Commentary* (Atlanta: Scholars Press, 1995).
106. *Inscriptiones Graecae* IV² 1 no. 122 (T 423 Edelstein and Edelstein).
107. See H.F.J. Horstmanshoff, "Did the God Learn Medicine?: Asclepius and Temple Medicine in Aelius Aristides' *Sacred Tales,*" in *Magic and Rationality in Ancient Near Eastern and Graeco-Roman Medicine,* ed. H.F.J. Horstmanshoff and M. Stol (Leiden: Brill, 2004), 325–42; M. E. Gorrini, "The Hippocratic Impact on Healing Cults: The Archaeological Evidence in Attica," in *Hippocrates in Context: Papers Read at the Eleventh International Hippocrates Colloquium, University of Newcastle upon Tyne, 27–31 August 2002,* ed. P. van der Eijk (Leiden: Brill, 2005), 135–56.
108. For Asclepius's integration into people's daily lives, see H. C. Kee, "Self-Definition in the Asclepius Cult," in *Jewish and Christian Self-Definition,* ed. B. F. Meyer and E. P. Sanders, vol. 3, *Self-Definition in the Graeco-Roman World* (London: S.C.M., 1982), 118–36.
109. C. A. Behr, *Aelius Aristides and the Sacred Tales* (Amsterdam: A. M. Hakkert, 1968).
110. B. Holmes, "Aelius Aristides' Illegible Body," in *Aelius Aristides between Greece, Rome, and the Gods,* ed. W. V. Harris and B. Holmes (Leiden: Brill, 2008), 77–109. On the concept of relative health: F. Kudlien, "The Old Greek Concept of 'Relative Health,'" *Journal of the History of Behavioral Sciences* 9 (1973): 53–59.
111. For Galen's Hippocratism: Smith, *The Hippocratic Tradition,* 62–176.
112. See Temkin, *Galenism,* 16–22.
113. See, e.g., Galen *Art of Medicine* 4, in C. G. Kühn, *Claudii Galeni opera omnia,* 20 vols., Leipzig: C. Cnobloch, 1821–1833, vol. 1, 314–15.
114. For Galen's views on women, see Flemming, *Medicine,* chaps. 5–6.
115. H. von Staden, "Lexicography in the Third Century B.C.: Bacchius of Tanagra, Erotian, and Hippocrates," in *Tratados hipocráticos: estudios acerca de su contenido, forma e influencia; actas del VIIe Colloque international hippocratique, Madrid, 24–29 de septiembre de 1990,* ed. J. A. López Férez (Madrid: Universidad Nacional de Educación a Distancia, 1992), 549–69.
116. For his public demonstrations: H. von Staden, "Anatomy as Rhetoric: Galen on Dissection and Persuasion," *Journal of the History of Medicine and Allied Sciences* 50 (1995): 47–66; A. Debru, "Les demonstrations médicales à Rome au temps de Galien," in van der Eijk, Horstmanshoff, and Schrijvers, *Ancient Medicine,* 69–81. On Galen's anatomy, see Nutton, *Ancient Medicine,* 230–33. For Galen's defense of the brain as the origin of the nerves (versus the heart, as in Aristotle), see *On the Doctrines of Hippocrates and Plato* 1.2, in P. de Lacy, *Galen, On the Doctrines of Hippocrates and Plato,* 3 vols., Corpus Medicorum Graecorum 5.4.1.2 (Berlin: Akademie-Verlag, 1978–1984).
117. Like Plato, he saw three major centers of life: the liver (appetitive), the heart (emotional), and the brain (mental and volitional). For Galen's physiology, see R. E. Siegel, *Galen's System of Physiology and Medicine* (Basel: Karger, 1968).

118. Anatomy "had given surgeons the ability to interpret or visualize the conditions they were tackling" (M. McVaugh, "Therapeutic Strategies: Surgery," in *Western Medical Thought from Antiquity to the Middle Ages,* ed. M.D. Grmek, trans. A. Shugaar [Cambridge, MA: Harvard University Press, 1999], 275). It must be noted, nevertheless, that Galen, like the early medical writers, preferred treatment through diet or drugs to surgical intervention, since he shared with them the idea that health belongs to the whole body.
119. Vivian Nutton, "Galen at the Bedside: The Methods of a Medical Detective," in *Medicine and the Five Senses,* ed. W.F. Bynum and R. Porter (Cambridge: Cambridge University Press, 1993), 7–16; T. Barton, *Power and Knowledge: Astrology, Physiognomics, and Medicine under the Roman Empire* (Ann Arbor: University of Michigan Press, 1994), 133–68; Perkins, *The Suffering Self,* 142–72.
120. On Galen's concept of experience, see P. van der Eijk, "Galen's Use of the Concept of 'Qualified Experience' in His Dietetic and Pharmacological Works," in *Galen on Pharmacology: Philosophy, History and Medicine,* ed. A. Debru (Leiden: Brill, 1997), 35–57; reprinted in van der Eijk, *Medicine and Philosophy,* 279–98.
121. See n. 63.
122. See, e.g., *On the Utility of the Parts* (Kühn xx). For discussion, see R.J. Hankinson, "Galen and the Best of All Possible Worlds," *Classical Quarterly* 39 (1989): 206–27.
123. Galen *On the Utility of the Parts* 11.14 (Kühn 2.158–60). See also R. Walzer, *Galen on Jews and Christians* (Oxford: Clarendon Press, 1949), 23–37; S. Gero, "Galen on the Christians: A Reappraisal of the Arabic Evidence," *Orientalia Christiana Periodica* 56 (1990): 371–411.
124. Two of Galen's treatises on the soul, *On the Passions of the Soul* and *On the Errors of the Soul,* are translated in P.W. Harkins, *Galen on the Passions and Errors of the Soul* (Columbus: Ohio State University Press, 1963). See also L. García Ballester, "Soul and Body, Disease of the Soul and Disease of the Body in Galen's Medical Thought" in *Le opere psicologiche di Galeno: atti del terzo colloquio Galenico internazionale, Pavia, 10–12 settembre 1986,* ed. P. Manuli and M. Vegetti (Naples: Bibliopolis, 1988), 117–52; R.J. Hankinson, "Galen's Anatomy of the Soul," *Phronesis* 36 (1991): 197–233.
125. He is present at the fictional symposium in Athenaeus's *Deipnosophists* (1.1e, 1.26c, 3.115c), written around 200 A.D., for example, and he was held in high esteem by the influential Aristotelian commentator Alexander of Aphrodisias, active at the end of the second century and the beginning of the third century A.D.
126. O. Temkin, "Studies on Late Alexandrian Medicine," *Bulletin of the History of Medicine* 3 (1935): 405–30; A. Cunningham, "The Theory/Practice Division of Medicine: Two Late-Alexandrian Legacies," in *History of Traditional Medicine,* ed. T. Ogawa (Osaka: Division of Medical History, the Taniguchi Foundation, Tokyo, 1986), 303–24, esp. 313–21.
127. Although Alexandria was still known for the expertise of its surgeons: O. Temkin, "Byzantine Medicine: Tradition and Empiricism," *Dumbarton Oaks Papers* 16 (1962): 101; Vivian Nutton, "From Galen to Alexander: Aspects of Medicine and Medical Practice in Late Antiquity," *Dumbarton Oaks Papers* 38 (1984): 5.
128. Eunapius, *Lives of the Sophists,* 497–98. Magnus's lectures, it should be noted, were not only on Galen, nor were they mere paraphrases of Galenic texts. His partially preserved work on the diagnostic analysis of urines, for example, greatly

expands on what was a small part of Hippocratic and Galenic semiology and perhaps founded the tradition of uroscopy in the Middle Ages.

129. See, e.g., the commentary by Stephanus of Athens, teaching in sixth-century A.D. Alexandria, on Hippocrates's *Aphorisms* in the edition of L. G. Westerink (Berlin: Akademie Verlag, 1985–1995). So entrenched do Galen's views on Hippocrates become that the Hippocratic writings extant in Arabic translation are simply extracts from Galen's commentaries (G. Strohmaier, "Reception and Tradition: Medicine in the Byzantine and Arab World," in *Western Medical Thought from Antiquity to the Middle Ages,* ed. M. D. Grmek, trans. A. Shugaar [Cambridge, MA: Harvard University Press, 1998], 144).
130. Nutton, *Ancient Medicine,* 296.
131. A. Ghersetti, "The Semiotic Paradigm: Physiognomy and Medicine in Islamic Culture," in *Seeing the Face, Seeing the Soul: Polemon's Physiognomy from Classical Antiquity to Medieval Islam,* ed. S. Swain (Oxford: Clarendon Press, 2007), 281–308.
132. See Temkin, *Galenism,* 73–80; Strohmaier, "Reception and Tradition," 156–62.
133. See, for example, Nemesius of Emesa *On the Nature of Man* 2.23-25 (in *Nemesius, On the Nature of Man,* trans. R. W. Sharples and P. van der Eijk [Liverpool: Liverpool University Press, 2008]); see also Temkin, *Galenism,* 81–92. Despite his unease with Galen's views on the soul, Nemesius drew extensively from Galen in creating a Christian anthropology.
134. Vivian Nutton, "God, Galen, and the Depaganisation of Ancient Medicine," in *Religion and Medicine in the Middle Ages,* ed. P. Biller and J. Ziegler (Woodbridge, UK: York Medieval Press, 2001), 15–32; Nutton, *Ancient Medicine,* 304–5.
135. Nutton, "From Galen to Alexander," 9.
136. See Philostorgius *Ecclesiastical History* 8.10, reporting that the late-fourth-century A.D. physician Posidonius was unusual insofar as he blamed mental illness on humoral rather than demonic causes.
137. For shifting ideas of the body in the early Christian period, see esp. P. Brown, *The Body and Society: Men, Women, and Sexual Renunciation in Early Christianity* (New York: Columbia University Press, 1988).
138. See, however, Nutton, *Ancient Medicine,* 248–71, on the panoply of people working as physicians in the Roman Empire.
139. Note, however, that the idea of demonic possession as the actual entry of demons into the body does not appear to exist in the archaic and classical Greek periods: W. D. Smith, "So-Called Possession in Pre-Christian Greece," *Transactions of the American Philological Association* 96 (1965): 403–26.
140. Aulus Gellius *Attic Nights* 18.10: it is shameful (*reprehensum*) to be ignorant of such matters, not only for a physician but also for a cultivated and educated man.
141. Vivian Nutton, "Medicine in Late Antiquity and the Early Middle Ages," in *The Western Medical Tradition: 800BC to AD1800,* ed. L. I. Conrad et al. (Cambridge: Cambridge University Press, 1995), 83–87.
142. J. Scarborough, "Theoretical Assumptions in Hippocratic Pharmacology," in *Formes de pensée dans la collection hippocratique: actes du IVe Colloque international hippocratique, Lausanne, 21–26 septembre 1981,* ed. F. Lasserre and P. Mudry (Geneva: Droz, 1983), 307–25. The basic theoretical principle of pharmacology in the early medical treatises is that opposites cure opposites, although there often appear to be sympathetic assumptions at work in their authors' therapeutic choices (H. von Staden, "Women and Dirt," *Helios* 19 [1992]: 7–30).

Sympathy becomes an accepted mode of explanation with the rise of learned magic in the Hellenistic period. For Dioscorides, see J. Riddle, *Dioscorides on Pharmacy and Medicine* (Austin: University of Texas Press, 1985), 169–76 on Galen's pharmacology.

Chapter 5

1. *Characters* 19.
2. Michel Foucault, *History of Sexuality,* vol. 3, *The Care of the Self*, trans. R. Hurley (New York: Vintage, 1988).
3. Foucault, *History of Sexuality,* vol. 3, 56.
4. Foucault, *History of Sexuality,* vol. 3, 101.
5. Celsus *De Medicina* 1.2.45, 49.
6. "On the Genealogy of Ethics: An Overview of Work in Progress," in *The Foucault Reader*, ed. Paul Rabinow (New York: Pantheon, 1984), 340–72; passage cited, 357.
7. Aristotle, *Physiognomics,* in *Minor Works*, trans. W.S. Hett (Cambridge, MA: Harvard University Press and W. Heinemann, 1936 [Loeb Classical Library]), 83–137.
8. Aristotle, *Physiognomics* 807b.
9. Aristotle, *Physiognomics* 806b.
10. Aristotle, *Physiognomics* 808b.
11. Aristotle, *Physiognomics* 811b.
12. Aristotle, *Physiognomics* 812a.
13. Aristotle, *Physiognomics* 813b.
14. Aristotle, *Physiognomics* 813b.
15. Petronius, *Satyrica*, ed. and trans. R.B. Branham and D. Kinney (London: J.M. Dent, 1996), 62.
16. Ovid *Metamorphoses* 8.618–724.
17. Theophrastus, *Characters*; Herodas, Mimes, Sophron *and Other Mime Fragments*, trans. J. Rusten and I.C. Cunningham (Cambridge, MA: Harvard University Press [Loeb Classical Library], 2002), 87.12.2–4.
18. Aristotle, *Physiognomics* 809b.
19. Aristotle, *Physiognomics* 810a.
20. Aristotle, *Physiognomics* 813a.
21. Aristotle, *Physiognomics* 814a.
22. Giulia Sissa, *Greek Virginity*, trans. A. Goldhammer (Cambridge, MA: Harvard University Press, 1990).
23. Aristophanes, *Clouds, Wasps, Peace*, trans. Jeffrey Henderson (Cambridge, MA: Harvard University Press, 1998 [Loeb Classical Library]), lines 428–29.
24. Aristophanes, *Clouds, Wasps, Peace,* 450.
25. Aristophanes *Wasps,* lines 1292–96.
26. Aristophanes *Wasps,* lines 1342–44.
27. Aristophanes *Wasps,* lines 1372–77.
28. Aristophanes *Wasps,* lines 223–27.
29. See Jeffrey Henderson, *The Maculate Muse: Obscene Language in Attic Comedy* (New Haven, CT: Yale University Press, 1975); on allusions to the phallus, see 108–30.