THE PROLONGATION OF LIFE IN EARLY MODERN ENGLISH LITERATURE AND CULTURE, WITH EMPHASIS ON FRANCIS BACON

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ABSTRACT

ROGER MARCUS JACKSON: The Prolongation of Life in Early Modern English Literature and Culture
(Under the direction of Reid Barbour)

Drawing upon early modern texts of poetry, theology, and natural philosophy written in England and the continent, this dissertation explores the intellectual traditions inherent in Renaissance discourses addressing the prolongation of life. It is organized around two nodal questions: Can life be prolonged? Should it be prolonged? The project hinges upon Francis Bacon (1561-1626), for whom the prolongation of life in the sense of a longer human lifespan serves as the loftiest goal of modern experimental science. Addressing the first question, Part One illustrates the texture and diversity of early modern theories of senescence and medical treatments against the "disease" of old age promoted by Galen, Avicenna, medieval theologians, Jean Fernel, Marsilio Ficino, and Paracelsus. Part Two then demonstrates that Bacon's theory of senescence and corresponding therapies nevertheless differ from those of his predecessors and contemporaries in three regards: their attempt to isolate senescence from disease, their postulation of senescence as a process based on universal structures and actions of matter, and their deferral to further experiment for elucidation. Addressing the second question, Part Three situates Bacon within a moral and theological context. It first divulges this context through a close analysis of his most explicit defenses for his project of life extension. Cued by Bacon, who argues that the prolongation of life is the most basic form of Christian charity as well as a natural desire, subsequent

chapters engage two sources by which early modern debates about the prolongation of life were fueled, Christian theology and classical philosophy. These inform poems and plays dealing with senescence and human longevity by two English authors whose lives overlapped Bacon's, Edmund Spenser and Ben Jonson. A comparison of their works with passages from the Bible, Seneca, Lucretius, Cicero, and John Calvin discloses tensions resident within early modern culture at large, tensions that arose from a matrix of conflicting beliefs—a natural desire for survival, Stoic and religious injunctions against life for life's sake, optimistic and pessimistic valuations of old age, and contrasting natural and transcendent ideals of human perfection.

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This dissertation on the prolongation of life has consumed a number of years of my own life, and in that time I have relied upon the assistance and encouragement of numerous persons who have helped me complete it. First, I must express my gratitude to all members of my committee. Of those on my committee, my director, Dr. Barbour, must be singled out for special thanks. His vast knowledge of and enthusiasm for everything about the Renaissance has been an inspiration for me, impelling me to pursue texts and ideas that initially seemed to lie far from the literature with which I began. Additionally, his deference and his irrepressible energy meant that he read everything I sent him graciously and fairly, no matter how long or dense, not even when after two years' silence I sent him a substantial first installment. Without the many words of good cheer from him and someone who matches his intelligence and verve, Dr. Wolfe, I doubt I ever could have finished this.

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I also wish to express my appreciation to my fellow graduate students in the Department of English at UNC, who made the school an enjoyable place in which to study and Chapel Hill a delightful town in which to live. The only blemish I see to finishing my dissertation is that it forces my departure from those whose presence I cherish.

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I would ever finish this dissertation; nonetheless, her words to me always reflected her hope and love, the guiding principles of her life, while her selfless actions embodied the same. To her I owe a profound debt.

My longest-standing debt is always to my family, including my brother Tom, my ardent champion, and my parents Roger and Sandy, who alternately challenged and encouraged me as a budding student. From elementary school till now, my family has afforded me the opportunity of a tremendous education. Without their unwavering support I simply could not lead the life I want, which, as I have come to see, is not my life alone but theirs, too.

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INTRODUCTION

Background

The current form of this dissertation represents something quite different from what I originally had planned. Although from the idea's inception I had planned to write about early modern concerns surrounding the prolongation of life, which the present work still addresses, I had thought that I would canvass a host of stories, images, disciplines of knowledge, and ethical and religious polemics that exercised the minds of early modern Englishmen when facing the prospect of longevity. My interest arose from two observations, one about the past and one about the present.

On the side of the past, I noticed without much claim to acuity that the sixteenth and seventeenth centuries of Europe witnessed a surge of interest in the prolongation of life. The great university medical schools of previous centuries plus new ones elsewhere in Europe trained more medical professionals than ever before, many of whom defended their art as a proven means of prolonging life. Moreover, hygienic manuals written both by those very physicians and by humanist educators proliferated, spreading the doctrine of "each man, his own best doctor" and touting regimens that could extend health into old age. At least two of these, Luigi Cornaro's immensely popular *De Vita Sobria* (1558) and Thomas Philologus of Ravenna's *De Vita Hominis Ultra Centum et Viginti Annos Protrahenda* (1553), departed from the classical model Galen's *De Sanitate Tuenda* (2nd century A.D.) by explicitly setting life extension as the goal of hygiene. Furthermore, whereas the humanist Petrarch had once spurned medicine as a mercenary and lethal deceit, now humanists such as Erasmus and Melanchthon composed encomia on behalf of medicine and its life-preserving techniques. Meanwhile, Ponce de Leon and other explorers sought and occasionally thought they had

found the fountain of youth.[1] Alchemists continued to search for an elixir of life that could reverse aging and immunize the body against decay, making its beneficiaries virtually immortal. Marsilio Ficino and other astral magicians like him believed that the quintessence of the stars when harnessed by images and song could improve health and extend life beyond what natural constitutions otherwise allowed. Inspired by both alchemists and natural magicians, Paracelsus taught a new art of refining chemical medicines that could bolster the *ens astrale*, the heavenly source of life, and potentially bestow upon adepts hundreds of additional years. Finally, within this milieu, Francis Bacon launched his great instauration of learning and set the prolongation of life, the retardation of age, and the renewal of youth as its loftiest practical aims.

On the side of the present, I had only to turn on a television or open a magazine to see the significance that the prolongation of life now carries. It is perhaps a truism that late-modern societies apply themselves with peculiar tenacity to the question how to secure longer, healthier lives for their citizens. The number of government health agencies, physicians, hospitals, nutritionists, clinical researchers, and businesses of every sort catering to the fitness of the body from the cosmetic to the pharmaceutical industries attests to the high value modern westerners now place upon health and longevity and to the amount of time, labor, and money they are willing to invest toward them. Interest in protracted survival and bodily well-being resides at the core of modernity and, though not originating with the modern age, certainly seems to have intensified when two distinctively modern intellectual traditions emerged and conjoined, a political philosophy that explains political organization as a function of individual survival, manifest in the works of Thomas Hobbes and John Locke, and a technical science of nature directed toward the alleviation of presumed encumbrances upon human happiness including disease and death, manifest in the works of Francis Bacon. Since then, according to the best estimates of historians and demographers, life expectancy has more than

[1] Unfortunately, my dissertation provides little commentary on narratives about the fountain of youth. A principal early modern source is *De Orbe Novo: The Eight Decades of Peter Martyr D'Anghera*, trans. Francis Augustus MacNutt, 2 vols. (New York: G.P. Putnam's Sons, 1912), I.274 and II.292-6.

doubled among European nations and America, with the result that life expectancy itself has now become a metric by which to gauge the advancement of civilizations the world over.[2] Longer lives substantiate the gradual secularization that western societies have undergone, as for many persons the goal of a full life with continued health eclipsed supernatural salvation from death. Longer lives, however, often carry their own this-worldly costs, as we hear with heightened alarm in daily news reports. The cost of medical care for those living long continually mounts, jeopardizing patients and their families, insurance providers, doctors, hospitals, and governmental healthcare programs, to say nothing of the burdens endured by those who experience long life without health. Not surprisingly, in the last decades the prolongation of life has become a major concern for bioethicists.

With both observations in mind, I additionally noticed that, despite resonances, little scholarly attention has been devoted to how those who propelled western society down this course, early modern Europeans, and perhaps especially the early modern English, conceived, debated, and struggled to achieve or prevent the prolongation of life. This study, I had hoped, would open a vista upon those questions, and it still does, only one smaller than I first expected. With this introduction I would like to explain the current organization of this study and why my dissertation now has the focal points that it does.

A Problem of Definition

In 1966, the historian of medicine Gerald J. Gruman published *A History of Ideas about the Prolongation of Life*, the first and only study of its kind. My dissertation will have many occasions to refer to Gruman's work, which is magisterial in its breadth, tracing an idea as it has appeared in both eastern and western cultures, from the earliest written accounts such as the *Epic of Gilgamesh* and texts of Chinese alchemy, up through the science and *philosophes* of the 1700s, yet sacrifices little

[2] Life expectancy has risen from roughly 32 years to 77 years. Compare Lawrence Stone, *The Family, Sex, and Marriage in England 1500-1800* (New York: Harper & Row, 1977), 66-81; and The United Nations Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2006 Revision* (New York: United Nations, 2007), 14-23.

accuracy to coverage, illuminating particular cases such as Cornaro, Bacon, and René Descartes. Consequently, Gruman's book, which first appeared in the *Transactions of the American Philosophical Society,* has had far-reaching influence but especially among other historians of medicine and among gerontologists. Although Gruman recognized the early modern period as pivotal in the history of the prolongation of life and discussed many of the same authors that I do, the narrower temporal limits of my study facilitate a greater depth of analysis than Gruman's purpose allowed, but I must acknowledge the great benefits that I owe to his work.

One benefit to me as well as to many of Gruman's readers has been his coinage and definition of the term "prolongevity." Prolongevity, according to Gruman, refers to "the significant extension of the length of life by human action." He prefers the word "prolongevity" to other options, notably "macrobiosis," which pseudo-Lucian used in an influential history of human longevity, because the latter is "too obscure," and "the prolongation of life," because that phrase is "too clumsy for frequent repetition."[3] At risk of clumsiness, in many cases I have opted for "the prolongation of life" and the gerund "prolonging life" although in other cases I employ "prolongevity" as Gruman intends and for reasons that I shall shortly explain. The somewhat unwieldy phrase "the prolongation of life" warrants greater usage here because of its historical authenticity; it shows up in several texts of the early modern period whereas "prolongevity" obviously shows up in none. Because early moderns use "the prolongation of life" widely and indiscriminately, it proves a more serviceable and ultimately more revealing term although its lack of discrimination leads to confusions that will need sorting out.

Gruman's exposition of prolongevity nevertheless has affected the macroscopic organization of my dissertation. Prolongevity, as Gruman notes, elicits another concept and coinage to capture "the belief that prolongevity is possible and desirable," which he dubs prolongevitism.[4] I borrow this word as well, and the questions of possibility and desirability form the two nodes around which my

[3] Gerald Gruman, *A History of Ideas About the Prolongation of Life* (Philadelphia: American Philosophical Society, 1966; reprint, New York: Springer Publishing, 2003), 3.

[4] Ibid.

study revolves. Parts One and Two examine how early moderns addressed the question whether one can prolong life, whereas Part Three examines how they addressed the question whether one should prolong life. In other words, the first two parts take up the question of possibility, and the third takes up the question of desirability. Furthermore, when originally conceiving this project, although I recognized that a comprehensive foray into the topic would have to negotiate both questions, I thought the question of desirability would come to dominate my analysis. After all, it was this normative question that literary authors were more apt to engage or at least engage more thoroughly, drawing upon philosophical and theological arguments, as Edmund Spenser, Ben Jonson, George Herbert, and Thomas Browne do, to admonish readers about the dangers and advantages of longer life. Thus, Part Three as it now stands represents a nascent and somewhat diminished product of my original conception, an analysis of only two of these authors and of a smaller allotment of their works than I had wanted, combined with truncated and embedded commentaries on moral and theological treatises pertaining to the prolongation of life.

The main reason for the abbreviation of Part Three has been a justified diversion into the first question and the time required to complete it, which has meant less time for augmenting Part Three. As a quick flip through my dissertation reveals, the pages devoted to Parts I and II now far outnumber those of Part Three.

My increased interest in the question of possibility can be explained by the attempt to clarify for myself what early moderns meant by "the prolongation of life," a question leading to Francis Bacon, who now has moved into a central and defining position in my dissertation, and to reflexive historical narratives written by today's gerontologists. To understand what the prolongation of life meant, the most obvious place to turn is medical texts. The Renaissance saw an important shift in the history of medicine with the proliferation of medical advice books, especially manuals of hygiene. According to historian Heikki Mikkeli, the three most important factors for this increase were the invention of the printing press, which expedited and enlarged the propagation of books generally; and then two impetuses more specific to the propagation of hygienic manuals, the rise of the bourgeoisie

across the cities of Europe and the fear of plague. Mikkeli infers that the new citizen class had a penchant for advice books of every kind while the horrors of epidemics kept readers on guard of their health.[5] According to historian Richard Palmer, the proliferation of medical advice books evinced another change as well, for a concern for hygiene generally translated into a concern for longer life. As he argues, during the later Middle Ages and the Renaissance, "hygiene came increasingly to be seen not simply as a means of conserving health, but as a technique in the eager pursuit of longevity."[6]

Longevity was associated with the branch of hygiene more than with the branch of therapeutics, for at least among writers in the main Galenic tradition it was through the daily balance of the non-naturals (excretion and retention, rest and exercise, passions, and air) that one checked both the dispersal of the radical moisture, the substance of life, by heat and its corruption by superfluous and putrid humors. The longer one could conserve the original amount and quality of radical moisture, the longer one could live. Still, the prolongation of life for many medical writers attached also to therapeutics or to the entirety of the medical art, as one can see in Jean Fernel's *Universa Medicina* (1586) and Laurent Joubert's *Popular Errors* (1578).[7]

Like Palmer, historians generally assume that by penning health manuals and spreading rules of practice, medical writers endorse the prolongation of life. In addition to Porter, Charles Webster assumes something similar in his monumental record of early modern science, *The Great Instauration*. On the surface, however, endorsement is not always what one finds. Although the question whether life can be prolonged inlays many early modern medical texts, it lacks a simple and consistent answer. The Belgian physician Levinus Lemnius, for instance, decides very much in the affirmative in his *Touchstone of Complexions*:

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[5] Heikki Mikkeli, *Hygiene in the Early Modern Medical Tradition* (Helsinki: Academia Scientiarum Fennica, 1999), 69.

[6] Richard Palmer, "Health, Hygiene and Longevity in Medieval and Renaissance Europe," in *History of Hygiene*, ed. Yosio Kawakita, Shizu Sakai, and Yasuo Otsuka (Tokyo: Ishiyaku, 1991), 87.

[7] I discuss portions of Fernel's book in Chapter 2. Joubert's book is discussed below.

> Therefore, to decline and shunne such things as be hurtful, and to prolonge lyfe many yeares, and to bring to passe, that olde age shall not be tedious, cumbersome, and burdenous, but easye, pleasaunt, and delightful, it lyeth a man in hand, to take that order and trade, whereby health may be maynteyned and still preserved, or if it happen to be discrased and empayred, how it may againe be restored and bettered.[8]

He also warns anyone "desyrous to keepe himself from beynge too soone Old, and to prolonge his lyfe as longe as may be" that he "take heede of many lettes and hinderaunces that damuifye and lye in wayte to prejudice hys lyfe, but namely and specially let him have a carefull eye to keepe himselfe from this Dry plight & state of body."[9]

By contrast, the English physician William Bullein opens his treatise the *Bulwark of Defense* (1579), with an emphatic disavowal that science and art can extend life, and this in spite of their many recognized achievements. The cause derives from the Bible, in particular Job 14:5: "Every mans course is appointed, they cannot prolong theyr time." God's ordained ministers, physicians, can only ease pains and heal wounds.[10]

To adduce more examples, the Welsh physician John Jones not only affirms physic's ability to prolong life but, invoking the authority of Hippocrates, asserts that the prolongation of life is one of its chief duties. Against those who "deny Phisicke to prolonge life, or proroge it," Jones gives three arguments: physic removes "distemperatures" of the body that shorten life by upsetting bodily spirits; physic "restores" degraded powers of assimilation necessary to replenish substance lost through the daily flux that otherwise would shorten life; and physic counteracts the superfluities that induce life-truncating diseases.[11] Written two decades before Jones's book, Andrew Borde's *The Breviary of Health* (1557), however, defends the antithesis with equal confidence. Like Bullein, Borde is emboldened by Holy Scripture, paraphrasing Job 14:5 at the end of this charge, too:

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[8] Levinus Lemnius, *The Touchstone of Complexions*, trans. Thomas Newton (London, 1576), 28 v.

[9] Ibid., 68 v.

[10] William Bullein, *Bullein's Bulwarke of Defence* (London, 1579), A ii r.

[11] John Jones, *A Briefe, Excellent, and profitable Discourse, of the naturall beginning of all growing and living things, heate, generation, effects of the spirits, government, use and abuse of Phisicke, preservation, etc*. (London, 1574), F ii v – F iii r.

"[T]hynke not that no man can be holpen by no maner of medecines, yf so be God do send the sicknes, for he hath put a tyme to every man, over the which time no man by no art nor science can not prolonge the time: for the number of the monthes and days of mans life God knoweth."[12]

Not all Renaissance medical writers spoke as firmly or simply, however. For instance, the lay hygienist William Vaughan, who often uses Lemnius as a source, certifies the ability of medicines and diet—in the broad, classical sense of a behavioral regimen—to prolong life, yet he thinks it necessary to add a disclaimer that immortality is impossible.[13] The English physician John Cotta verges closer to denial. Despite ostensibly assenting to the hygienic goal of longevity, he writes as though the only thing preventing the attainment of one's innately given lifespan is to avoid "the inextricable knots of sicknesse, paines and death" that entangle and enfold "the thread of life," the worst of which unlearned physicians introduce.[14] Eleazar Duncon, who deploys the standard life-as-lamp metaphor, encourages readers to follow the example of Galen himself, who "protracted his life untill extreame olde age without any sicknesse" by changing half-way through his life the quality of food he ingested.[15] Thomas Cogan displays how the life-as-lamp metaphor generally worked to the opposite effect, arguing that, although a person cannot avoid decay and death, through the moisture of nourishment life "is preserved and prolonged."[16] In Thomas Moffett's dialogue *Healths Improvement*, one character scoffs at medicine's claim to prolong life until the other character explains that the prolongation of life does not entail immortality or living "as long as Adam did." Rather, life is prolonged "by how much…diseases are eschewed."[17]

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[12] Andrew Borde, *The Breviary of Health* (London, 1557), 6.

[13] William Vaughan, *Approved Directions for Health* (London, 1612), 138: "*Shew me certaine remedies to prolong life*. To live forever, and to become immortall here on earth, is a thing impossible: but to prolong a man's life, free from sicknesses, and to keep the humours of the body in a temperate state, I verily believe it may be done, first by God's permission, by observing a good dyet, and sometimes by using of some Treacle, Methridate, or such like in the Spring time and Autumne."

[14] John Cotta, *A Short Discoverie of the Unobserved Dangers of Severall Sorts of Ignorant and Unconsiderate Practicers of Physicke in England* (London, 1612), 9.

[15] Eleazar Duncon, *A Copy of a Letter Written by E.D. Doctour of Physicke* (London, 1606), 6-7.

[16] Thomas Cogan, *The Haven of Health* (London, 1584), 194.

[17] Thomas Moffett, *Healthes Improvement* (London, 1655), 4. Probably, Moffett wrote the book in the 1580s.

As these several examples demonstrate, on their surface medical advice books voice contradictory answers about whether or not the prolongation of life is possible. Their disagreement, however, often rests upon the vagaries of the phrase. William Bullein is a good case in point. His negative answer given in the *Bulwarke* contradicts his opinion expressed in the *Governement of Healthe*, published two decades prior, in 1558: "Through surphite have manye one perished, but he that diateth himselfe temperatly prolongeth his lyfe."[18] Although we cannot exclude the possibility that Bullein underwent a full reversal of opinion in twenty years, a simpler resolution can be found in the different frames of reference in each example. The earlier affirmation occurs in the midst of an exposition of recommended praxis, whereas the later denial occurs in introductory pages that situate medicine under divine law.

Bullein's apparent self-contradiction replicates at the individual level the overt disparity between himself and Lemnius, and it turns on the same crux. Generally, Renaissance medical writers assent to and even insist upon the ability of their art to prolong life as a way of validating medicine. Apologies written on behalf of physic frequently complain of the facility with which it suffers disbelief from lay persons and patients who too quickly use a failure of treatment to debunk the art of medicine rather than blaming, as supposedly they should, uncontrollable circumstances, the intractability of the disease, or their own disobedience toward the doctor's orders. John Jones's defensive tone responds to this expected counter-attack. Additionally, learned physicians accuse quacks and empirics of disabusing the public of their faith in true medicine. Arguments for physic's ability to prolong life constitute a defense against all such skeptics. The prolongation of life serves as a barometer of medicine's success. In these cases, however, the prolongation of life usually refers to salvation from premature death caused by diseases either acute or chronic or by injuries that medicine supposedly can redress.

[18] William Bullein, *A Newe Booke Entituled The Governement of Healthe* (London, 1558), 45 v.

On the other hand, when Renaissance medical writers deny medicine's ability to prolong life, their arguments generally are erected upon a foundation of theological insight.
They answer in the negative when, like Borde or Bullein in his later work, they conceive of the prolongation of life as an increase beyond one's divinely ordained span implanted in the body through nature. Their ambitions for their art recede before the measure of life that nature and God supposedly set.

Thus, although sometimes medical writers of the Renaissance defy our expectations and surprisingly assert that nothing, not even their arts, can prolong life, they probably agreed with one another once adjustments for signification are made. Tellingly, divergent opinions over the question about the possibility of prolonging life did not sift medical writers into polemical camps. That fact may indicate a tacit consensus: medical writers agreed that their art can prolong life in the sense of adding time against a disease that otherwise would have foreshortened life but not in the sense of adding time beyond the determination of God.

Defining Lifespans and Prolongevity: Laurent Joubert

Nevertheless, that dichotomy does not represent all the choices for interpreting the prolongation of life available in the Renaissance or all the possibilities contained in the examples above. If nothing else, it leaves open the possibility of differences of meaning in relation to individuals and in relation to the human race. For further elaboration on these points, I would like to turn at greater length to the French court physician Laurent Joubert, who tried to cut through the confusion surrounding the possibility of prolonging life in one of the period's most extensive treatments of the subject. The second chapter of his book *Erreurs Populaires*, perhaps the most popular medical text in early modern Europe, considers the titular question, "S'il est possible par la médicine allonger la vie des homes," or, "Whether It is Possible to Prolong Man's Life through

Medicine."[19] This question comes early, presumably because Joubert seeks to embark by defending medicine against the common charge that it is at best useless, at worst deadly.

Like a good humanist, Joubert examines the dilemma *in utremque partem*, viewing it from both sides before delivering his judgment. The approach is warranted, he thinks, by the difficulty of the thought and the variety of expressed opinions. With this question, he says, the mind probes "the deepest recesses of nature" where it becomes enveloped by dark problems of theology and natural philosophy. Although, according to Joubert, "physicians maintain" the possibility of prolonging life, they do not speak univocally. (He thus lends cachet to my theory of a tacit consensus among medical writers.) On the one hand, some deny the possibility of prolonging life, citing scriptural injunctions such as Job 14:5 ("Seeing his days are determined, the number of his months are with thee, thou hast appointed his bounds that he cannot pass."), the same verse to which Bullein and Borde allude. Additionally, gainsayers rehearse arguments by Aristotle, Averroes, and Avicenna to the effect that every living thing has a term appointed by nature; over time, each creature's natural heat and humidity gradually diminish, resulting in death. Furthermore, God has fixed these terms within nature, and therefore, seemingly, the only way available by which to stretch one's lifespan is "the grace and will of Almighty God." Such was the kind of special favor awarded to King Hezechias, whose repentance for past sins won him an additional fifteen years of life from God—an oft-repeated exemplum (2 Kings 20: 1-11).

On the other hand, Joubert continues, there are good reasons to suspect that "the natural limits of life can be stretched and lengthened through the remedies and prescriptions of our art" (39). Astrologers have taught as much, and it is confirmed by the experiences of physicians who have extended the lives of frail and sickly persons who otherwise would have died much sooner. The *loci classici* that Joubert cites are Herodicus, a man described by Socrates in Plato's *Republic* as

[19] Parenthetical page references are to *Popular Errors*, trans. Gregory de Rocher (Tuscaloosa: University of Alabama Press, 1989). The French edition that I have consulted is *Erreurs Populaires au Fait de la Medicine et Regime de Santé* (Bordeaux, 1578).

perversely committed to his health, who lived over one hundred years on a spare diet, and Galen himself, who in *De Sanitate Tuenda* purports to have overcome in-born infirmities through a sound regimen and thus to have lived much longer than originally destined (Duncon's example, too).[20] Secondly, medicine offers the means by which health and life are sustained. A man using an unsound diet succumbs both to sickness and to an early death. He "either consumes his natural moisture sooner than he normally would, or he smothers and extinguishes his natural heat, upon which all things depend for life." But, as the law of contraries dictates, if one can abbreviate life, one can also prolong it. The means are "a sound diet and proper life-style." Although death cannot be put off forever, our natural demise can be retarded:

> Even though the troubles springing from our constitution cannot be avoided, such as the emanation and continual dissipation of our substance (effected by natural heat), from which proceeds old age because of excessive and unavoidable exsiccation, this process can nonetheless be slowed down by our art, and we can stop the last day from coming too soon. (40)

As evidence, people close to death survive a little longer when they receive comforting medicines like malmsey wine and *aqua vitae* (40).

Such are the arguments that Joubert presents for and against the possibility of prolonging life. In his view, the problem originates from, but is not reducible to, a confusion of words and concepts. As he explains, people speak of three different "terms of life" (*les termes de la vie*): the "supernatural" (*sur-naturelz*), the "natural" (*naturels*), and the "upset" or accidental (*accidantaires*). Supernatural lifespans are "fixed and ordained" by God "purely of His free will." Such were the super-elongated lives of "men in the first age of the earth before the deluge." These enormous lives were granted by God "for the multiplication of the human species, and especially to Noah for the restoration of man." They cannot be "duplicat[ed] by any art or advice." With intelligence and proper behavior, however, human beings can achieve their natural lifespans, which are "those given to people according to their diverse natures and their diverse fundamental constitutions, strong or

[20] Plato, *The Republic*, 406a-b. Like Joubert, many other early modern medical writers express favor of Herodicus's stringent regimen despite Socrates's estimation of it as a long, unpleasant dying.

weak, by virtue of which some live a long time and others a short time, according to the order of nature." God permitting, people will attain the natural lifespans allotted their constitutions if they live temperately and avoid deadly misfortunes. A life cut short by intemperance and misfortunes such as "injuries, poisons, burns, falls, collapse, shipwrecks, plagues, and other common evils" reaches only the third, the upset or accidental span (41).

It is the middle term, the natural lifespan, Joubert says, about which he speaks. The art of medicine cannot reproduce the supernatural lifespans of the Biblical patriarchs. Nor can it do anything to avert misfortunes, only heal (when possible) the results of misfortunes, for the kinds of misfortunes listed are "the pure will of God" and "for the most part unavoidable."

Medicine can help with the natural lifespan, but how is a little confusing. It would seem that medicine works to prolong life by teaching or promoting temperance. Like a fall or shipwreck, intemperance shortens the natural lifespan accidentally but with this difference: human beings can control intemperance. Disorderliness abridges the natural lifespan while orderliness fulfills it, but people have control over whether they live in a disorderly or orderly fashion (41). For Galenists like Joubert, medicine depended heavily on ethics. Ethics was especially important to the branch of Galenic medicine that dealt most directly with the prolongation of life, hygiene, and it informs *Popular Errors* throughout. However, ethics gives only the ideal of temperance; it does not explain how each person might achieve the balance of the non-naturals appropriate to his constitution. The balance of those non-naturals was the sum of an orderly life for Galenists. A practical complement to ethics, physic assists the business of adjusting the six non-naturals for a given person at a given time and place.

Through medicine's practical and particular application, Joubert justifies its ability to lengthen life. This former professor of Montpellier goes on to deliver an orthodox account of natural decay and death: "All the philosophers and physicians agree that the length of our lifespan is measured in terms of natural heat and moisture, upon which all life depends." Nature invests in each human body a "power" that ameliorates the gradual dissipation of natural heat and moisture. This

power involves what early modern physicians sometimes called the triple substance of the body—air, blood, and flesh, or, in Joubert's words, "respiration, pulse, and the continuous supply of nourishment." Out of those substances, the body works to repair itself by substituting adventitious moisture for natural moisture, but, because this power of repair is finite, the body "dries up little by little, and this moistening power becomes less effective and weakens day by day, until, in the end, the body ceases to take sufficient nourishment." The members dry, wither, weaken, and wrinkle, resulting in old age. When the "primitive moisture" fails, death occurs (41).

Although medicine cannot forever repel death, it "does provide us with two things," Joubert insists. One is freedom from all rotting or putrefaction that does not arise externally, as plagues and poisons do. The other is "the conservation of our natural moisture so that it lasts longer and is consumed more slowly" (41-42). Together, these two medical intentions can prolong life to its natural term "according to the particular nature of each person." To escape rot and conserve moisture, physicians regulate the non-naturals (42).[21]

It seems that, as Joubert would have it, the prolongation of life occurs when an orderly life prevents an early death. Further, to stretch life even that far, a medical professional is necessary, and a well-trained medical professional at that, one who knows the right combinations and measures of the various *materia medica* and behaviors to prescribe for each patient. Nevertheless, the medical art can protract life no farther than the limit already set down by nature for the peculiar disposition of that patient.

Joubert, however, goes on to claim more. To claim no more would be as much to say that "those who are temperate and take care of their health will live longer," an obvious fact. In Joubert's words, living so long is no more than "attaining without shortening it the end and term ordained by

[21] To this end, physicians have three operations at their disposal, according to Joubert. First is "to protect from outside heat, to stop obstructions, and to cast off excrements"—remedies against putrefaction. Second is "to administer food and drink in proper substance, quality, quantity, time, and order." Third is "to abstain from what, by consuming and taxing our natural moisture, quickly dissolves or dissipates our natural heat, such as excessive work, spices, staying up at night, worries, diverse emotions, but above all, excessive carnal copulation, especially at improper times." These operations require the oversight of a trained physician who can not only evaluate the particular nature of each person but also knows "the orders and prescriptions of medicine" proper to each (42).

nature." But, he insists, the medical art can actually postpone the "natural close of life," meaning the term predicated upon one's natural constitution (42). In other words, the natural lifespan is open to adjustment by art. Art can do more than ensure one reaches the lifespan allotted by nature, it can change that lifespan altogether, stretching it to a new length.

Joubert marshals several arguments to make the case that "life is not only preserved by our devices but also prolonged." In the first, he begins by postulating that anything can be made stronger if its sources and principles are strengthened. Although he admits that the principles of life, natural heat and natural moisture, cannot be "reintegrated" (*reintegrés*), he also asserts that they at least can be "restored, repaired, and rendered more vigorous by our art." Proof is in the treatment of "hectics," those persons suffering from fevers, the subject also of Galen's *De Marasmo,* an early source about medicine's role in prolonging life.[22] In Jourbert's day, hectics commonly were prescribed deep-moisturizing treatments, such as freshwater baths, which were thought to repair the natural moisture and halt its suddenly rapid consumption. Thus, he reasons, if one employs such moisturizing regimens and if at the same time one can tamp down the natural heat, slowing its consumption of the natural moisture, one can prolong a life that "would have been shorter according to nature." Hard and spermatic parts—bones, ligaments, arteries, veins, membranes, muscles, etc.—pose a particularly tough obstacle, for they cannot be moistened directly. Nonetheless, even they receive alimentary moisture "into their pores and empty places," which retards the consumption of the radical moisture. He concludes with the proverbial analogy: like water to a lamp, a moistening regimen extends the life of a flame by diluting the oil (42).

Still, two other arguments remain. They are quite similar to one another yet more evocative than the previous one because they state more explicitly what Joubert has been supposing all along, namely, that each person's natural constitution can be altered. As Joubert explains, the collected wisdom of physicians and natural philosophers dictates that those born with warm and moist

[22] I discuss *De Marasmo* extensively in Chapter 1.

complexions, i.e. sanguine complexions, live the longest whereas those born with a cold and dry complexions, i.e. melancholic complexions, live the shortest. This is due to the relatively cold and dry conditions of old age and death. If vitality shrinks as natural warmth and moisture decline, those born substantially warm and moist can eke out a life longer than anyone else's. Generally, all things else being equal—diet, climate, care of health, etc.—one's complexion determines the length of one's life. But, Joubert maintains, "the virtue of our art is so strong that it is able to change little by little this natural cold and dry temperament into its opposite." Medicine enables those with naturally cold and dry temperaments to live longer than even nature originally dictates. His authority comes from Galen. Joubert cites the last two books of *De Sanitate Tuenda*, in which, according to him, Galen shows that medicine can gradually shift a cold and dry complexion toward a warmer and moister one (43).

His third and final argument is that medicine can improve the complexion common to each stage of life, not just the complexion given at birth. According to traditional theory, whatever temperament one possesses, it is warmer and moister at the beginning of life, in childhood and youth, than it is near the end, during the coldness and dryness of old age. Joubert argues, however, that just as medicine can alter the inveterate complexion of each individual given at birth, it can invigorate the body at any time during the lifecourse. It can enhance the vitality of each period and thereby lengthen each period, even old age. If it can lengthen each period, it can lengthen the whole lifecourse. Invoking the authority of Galen once again, Joubert claims that medicine can preserve "the vigor or flower of youth." So long as medicine succeeds at its two principal tasks toward the body—restoring substances lost and evacuating superfluities—the body "will enjoy health and will be preserved for a long time in the strength of its vigor" (43). By the same means, medicine protracts old age. Like other physicians optimistic about life extension, Joubert envisions an artfully prolonged old age as healthful and pleasant, with morbidity compressed into the final days: if the body is well maintained, decline comes "very late," and death, not till "extreme old age" (43). This is the case, presumably,

because longevity arises through health, the same behaviors that preserve or restore the feeling of a normal bodily condition sustaining the strength of the body and the vigor of its functions.

Because Joubert concludes that medicine can lengthen the so-called natural lifespan "beyond what is ordained by nature," one might wonder how far he thinks it can push that limit. His simple answer is to about 120 years. Just before he recounts the three intentions by which medicine can ensure that the "natural limit" of life is reached, he avers not only that can medicine not remove the inevitability of death but also that it is unable "to carry each person all the way to the most remote limit of his natural lifespan, perhaps one hundred or one hundred twenty years" (41). As said, by natural lifespan, Joubert refers to the term of life for individuals "according to their diverse fundamental constitutions." But he also recognizes a term for the human race as a whole. In other words, he recognizes both a particular lifespan varying by individual constitution and a lifespan appropriate to the species. The "most remote limit" for human life is about one hundred or 120 years; however, within that limit, the lifespans of individuals may vary a great deal according to the complexions given at birth. Medicine can postpone the term designated for any complexion, according to Joubert, but cannot protract the life of any complexion to the largest term of the species. Even under the care of medicine, those who are born infirm and just too cold and dry may not be able to reach the maximum span of 120 years.

All depends on God, however. Joubert concludes his chapter on whether medicine can prolong life with an affirmation of God's ultimate dominion over human life, an affirmation, though, that also sanctions medicine's subordinate reign:

> And these are the limits that God, principal author of medicine, has wished to make subject to this art, and which are in our power as long as God permits and does not cut short the thread of our lives. Just as in other instances, in contradiction to every law of nature set by Him, He sustains and continues life miraculously, without any medicinal aid, even without food and drink. (43)

As seen before, God can cut life short of the limit ordained by nature, so reaching that limit requires His favor. Not surprisingly, surpassing it requires His favor too, but, luckily, God already has shown his good will through His authoring of medicine. But God still can do what medicine cannot: He can

work in complete contradiction to the laws of nature. Medicine must work within nature's laws, employing drugs, food, and drink. Thus, Joubert ends by affirming three interconnected theses. He holds forth the possibility of God's prolonging human lives well beyond what nature alone or the medical art assisting nature can procure; in other words, God stands above nature. Simultaneously, he subjugates medicine to nature but not to nature's usual patterns: the medical art may not be able to escape nature altogether, as God can, but it can thwart nature's tendencies. Finally, he hallows, or tries to hallow, medicine's abrogation of nature's usual patterns: when medicine thwarts nature's tendencies, it does precisely what God, its author, wishes it to do.

Joubert's *Popular Errors* offers a few different meanings of "the prolongation of life" based on varying senses of "lifespan" as early moderns may have understood the two terms, and his explication of the topic helps me explain why the first two parts of this dissertation focus on early modern gerontology and are oriented by Francis Bacon. Although Joubert explicitly distinguishes accidental, natural, and supernatural lifespans, the middle one of these, the natural, which also proves the most problematic, splits into the natural lifespan of the individual and the natural lifespan of the human race. In fact, as I understand him, Joubert differentiates the supernatural lifespan allowed by God to certain extravagantly long-livers such as the antediluvian patriarchs as length of life in excess of the natural limit of the human race. The natural lifespan of the individual, on the other hand, appears to be a function of the aging process.

When defining "prolongevity," Gerald Gruman resorts to a similar differentiation of words associated with length of life. In the parlance of today's sociologists, life expectancy refers to "the number of years which the average person can expect to live."[23] In western nations, life expectancy has increased dramatically in recent centuries, primarily as a result of improved public health and an

[23] Gruman, 4.

elimination of childhood diseases that skew the "life-curve" downward.[24] When we hear someone speak casually about the greater lifespans that persons now enjoy, it is, in the terms of sociology, really life expectancy that is meant, a calculation of modern, mathematical demographics and the actuarial tables of insurance companies. "Lifespan," though, refers to the "extreme limit" of time that a human life may attain. Thus, as Gruman points out, the lifespan has changed little over the course of history although life expectancy has shifted greatly. As Gruman also cautions, however, the distinction of a lifespan may conceal a "moderately apologist" framework when one assumes that the historical lifespan is the same as the natural lifespan. Gruman consistently pits prolongevists against "apologists," those who like (supposedly) Aristotle, Galen, and most writers in the mainstream of medical tradition oppose or dismiss efforts to affect longevity. Instead apologists defend old age as a natural necessity, sometimes as a natural good. We tacitly enforce their perspective if we mistake a historical and extendible limit for a natural and permanent limit.[25]

As Gruman proceeds to trace prolongevists and their writings, the principal task of prolongevitism crystallizes. This is to slow, halt, or reverse the process of senescence.[26] Barring external accidents that Joubert mentions, senescence finally determines the length of an individual's life. Thus the business of prolongevitism, which amounts to raising the historical limit of human life, becomes remedying senescence. As Gruman observes, through history prolongevists have sought more than the expansion of lifetime, the curse that the mythical Tithonus suffered; they have sought the prolongation of youthful energy and health and the avoidance of infirmity.[27] Senescence

[24] A tool of demographers, the life-curve plots survival rates for different ages using an x-axis of ascending ages and a y-axis of survival percentage.

[25] Gruman, 4 and 9-10.

[26] The "apologist" alternative is to prevent the acceleration of senescence. In the Renaissance, some medical writers dismissive of attempts at prolongevity argue that one can speed up aging but not slow it down.

[27] Gruman, 4. Prolongevity may occur according to several models. In terms of modern biogerontology, these are "compressed morbidity," "decelerated aging," and "arrested or reversed aging." (See Stephen G. Post and Robert H. Binstock, "Introduction" to their *The Fountain of Youth: Cultural, Scientific, and Ethical Perspectives on a Biomedical Goal* (Oxford: Oxford University Press, 2004), 2-4.) By contrast, early modern prolongevists do not express clearly what an expanded period of *status* may mean for the subsequent period of *decrementum*, whether it may be proportionately expanded or compressed to nullity. The high hopes of alchemists and Francis Bacon, however, suggest the latter.

designates the conglomeration of impairments to the achieving a true, natural limit (if there is one) that inhere in the body's development and maintenance. Although Gruman allows for moderate and extreme forms of prolongevity, I shall use his coinage in the sense just disclosed, as the extension of life by human action beyond an accepted historical limit. In the Renaissance, the commonly accepted historical limit was often taken as a natural limit for the human race, and, as explained later, medical writers and others often valued it at 120 years.

The Question of Possibility (Parts One and Two)

The "prolongation of life," however, may cover a broad range of denotations, as early modern medical writings have revealed. In examining the question of the possibility of prolonging life, I have decided to discuss only in a limited capacity the basic sense upon which most early modern medical writers appear to have agreed, the prolongation of life as the interception of an earlier death, and only as it mingles confusingly with the prolongation of life in another sense—the primary one for me—which is the extension of life up to or beyond an individual's natural span or the supposed "natural" span of the human race. As Joubert demonstrates, a natural span was the most problematic for early moderns. An individual's natural span could be adversely affected by plagues or by diseases wrought by intemperance—hence the connection to the prolongation of life in the first sense—but eventually it was determined by aging. Thus, when discussing the possibility of prolonging life, my dissertation carries as its focus early modern gerontology.

My interest in this important subset of the prolongation of life ties to Francis Bacon, with whom it originally arose. In a passage from *De Dignitate et Augmentis Scientiarum* (1623) that I review more thoroughly in Chapter 3, Bacon claims to be the first person to recognize the prolongation of life as a branch of the art of medicine. Against remarks by previous medical writers attesting to medicine's ability or purpose to prolong life, some of which Bacon no doubt had read, his claim is quite startling, but perhaps not so much when one grasps more clearly what Bacon means by the "prolongation of life." As Bacon says, he intends the stretching of "thread of life itself" rather

than merely the addition of life subsequent to the remission or prevention of disease, which, according to him, is the meaning intended by physicians. Bacon proposes to treat senescence directly, and, like the alchemists and natural magicians of his day, he is a prolongevist. Moreover, he sets prolongevity atop the great instauration. Prolongevity is the ultimate, practical gain of the new science.

The thrust of Parts I and II is to demonstrate that Bacon's claim to innovation is largely legitimate although the medical tradition into which he inserted the prolongation of life exhibited more complex and dynamic theories and therapies for senescence than historians, gerontologists, and even Bacon himself acknowledge. My argument defending Bacon's claim does not turn simply on the point that, for him, the prolongation of life denoted radical life extension whereas, for Galenists, it meant something more modest. My analysis involves Bacon with alchemists and natural magicians as well, whose attempts to lengthen life by vast measures he openly acknowledges, and whose nostrums and beliefs factored into contemporaneous medicine, as he states. Instead, as I hope to show, Bacon differs profoundly from various predecessors who sought to prolong human life on three more technical counts, all related to his theory of senescence: his isolation of senescence as an object of study distinct from disease; his view that senescence emerges from the invisible structures and actions of ordinary matter; and the self-acknowledged incompleteness of his theory, which requires future experiment for correction and refinement. In other words, when Bacon claims to be the first to submit the prolongation of life beneath the art of medicine, his understanding of "art" matters just as much as his understanding of the "prolongation of life." Coincidentally, the three differences I note about Bacon's theory of senescence also foreshadow the tenets and methods of a much later biogerontology. Hence, another way of phrasing my thesis is to say that, in several regards, Bacon shares things in common with scientists who succeed him in the nineteenth and twentieth centuries that his predecessors do not. Bacon represents a proto-biogerontologist.

My analysis of Bacon's theory of senescence, contained mostly but not exclusively in his *History of Life and Death* (1623), occupies the chapters of Part Two. Part One is partly propaedeutic.

It provides a context in which to see that the major theories of senescence prior to Bacon often fall out with his over the three points mentioned above. Part One offers detailed readings of influential and representative works of medicine and hygiene of the classical, medieval, and early modern periods with the aim of contextualizing but finally off-setting Bacon; however, another reason for the closeness of my analysis is to illumine the various ways these other medical writers had of conceptualizing and, as they thought, combating senescence. Bacon avers that physicians prior to himself elided the prolongation of life with the interception of the life-shortening effects of disease. His characterization is not wholly accurate. In addition to alchemical and astrological physicians, Galenic physicians like Joubert saw or thought they saw means of stretching the thread of life itself. Severe methods such as hectic baths and purges perhaps could prolong life not just against disease but against nature. That aspect of Galenic medicine is glossed over not only by Bacon, who balks at the tradition's applications too, but also by more recent historians and gerontologists.

Indeed, I justify the length and detail of Parts I and II by the significant shortcomings and errors perpetrated by historiographies about Bacon's physiological theories and early modern gerontology at large. Since Gruman's book, gerontologists writing about the history of their field, as well as historians of medicine, often have recapitulated Gruman's rather homogenizing assessment of Bacon and the dominant gerontology of the period. Typically, these historical accounts minimize Bacon's innovations with one of three arguments. His notion of "vital spirits" indicates that he interpreted senescence in terms of a vital substance, as the radical moisture theory did.[28] Secondly, because he characterized old age as a process of drying, he adhered to an essentially Aristotelian and Galenic view.[29] Lastly, he failed to comprehend the connections between aging and the other

[28] See Gruman, 142; Leonard Hayflick, *How and Why We Age* (New York: Ballantine, 1994), 193; and S. Jay Olshansky and Bruce A. Carnes, *The Quest for Immortality* (New York: W.W. Norton, 2001), 200.

[29] See Gruman 142; and Stephen Katz, *Disciplining Old Age: The Formation of Gerotological Knowledge* (Charlottesville, VA: University of Virginia Press, 1996), 34. Later in his life, Gruman suggests that Francis Bacon may have been more innovative than he first acknowledged. See his introduction to the 2005 edition of Cornaro's *The Art of Living Long*, xxi-xxxv.

domains of natural science.[30] In some ways, Bacon's writing miscues interpretation, because he wrote science in a dialectical manner that often scatters abroad related axioms and because he deliberately applied conventional language in new ways. By combining various texts by Bacon and paying close attention to his language, I try to demonstrate how these arguments either fall short or mislead. The chapters of Part Two follow Bacon's logic to show that, although he employs conventional language like "vital spirits" and "drying," he analyzes these concepts differently from the Aristotelian-Galenic tradition and encourages readers and subsequent researchers to re-think them as well. Vital spirits and desiccation, as Bacon conceives them, manifest the universal motions of bodies, which remain to be divulged fully by subsequent experiment, and thus Bacon's theory of senescence does not just intersect other branches of knowledge, it leans heavily upon them.

Another potential confusion about Bacon appertains to scholars who generally have recognized the importance of the prolongation of life to him. From what I can discern, in the years following the publication of *The History of Life and Death*, his *magnum opus* on aging met with little comment or controversy. That reaction warrants greater scrutiny, and, if given more time, I would have included a chapter about the reception of *The History of Life and Death*.[31] Nonetheless, scholars such as Charles Webster have characterized the advances in medicine and public health in the eighteenth century as steps toward fulfillment of Bacon's dream that experimental and cooperative science improve life expectancy. The title of Webster's book, *The Great Instauration*, could not be more Baconian, and after its prompt, the title of his chapter on early modern medicine, "The

[30] See W. Andrew Achenbaum, *Crossing Frontiers: Gerontology Emerges as a Science* (Cambridge: Cambridge University Press, 1995), 7.

[31] Two references to *The History of Life and Death* that I have found are: George Hakewill, *An Apologie or Declaration of the Power and Providence of God in the Government of the World* (London, 1635), III.182 and 185; and Joannes Jonstonus (Hakewill's Polish epitomizer), *An History of the Constancy of Nature* (London, 1657), 48-50. William Rawley's memorial volume of poetry contains one poem (XVI) about *The History of Life and Death* specifically; however, the poem seems more interested in the word-play that Bacon's title affords than in the ideas of the book. Although Thomas Sprat praises Bacon frequently in *The History of the Royal Society of London* (1667), his book shows little to no interest in the topic of prolonging life, the practical aim most dear to Bacon. A closer inspection than I have been able to perform of the early editions of *The Philosophical Transactions of the Royal Society* may reveal a concern with combating senescence, but at least the first edition, written by Henry Oldenburg in 1666, lists no experiments or findings explicitly provoked by Bacon's *History of Life and Death*. The polemical minister Alexander Ross discusses some of Bacon's ideas about medicine and longevity in *Arcana Microcosmi* (London, 1652), 247-8; however, he probably draws from *Sylva Sylvarum* rather than *The History of Life and Death*.

Prolongation of Life," is similarly suggestive.[32] To some extent, the transformation of early modern medicine may represent early fruits of Bacon's plans; however, as Part Two should help explain, it would be more correct to say that from the seventeenth to the twentieth centuries medicine largely avoided what Bacon designated as its principal aim, instead using new means to further the traditional cause of prolonging life by averting early death. Much time elapsed before medical researchers became concerned with defining old age and attempting to treat it directly. Even now, few are.

With relation to early modern gerontology at large, the misconceptions I wish to redress result from the label "apologist." When first attempting to write this dissertation, I tried to adhere to Gruman's distinction between moderate and radical versions of prolongevity; however, I soon became frustrated by the bleeding between moderate prolongevists and so-called apologists. In some ways, this confusion prompted the analyses of Part One. Gruman ranks Luigi Cornaro as a moderate prolongevist, but Cornaro advocates raising what we would call life expectancy (an average) closer to the lifespan (a maximum) or at least ensuring that his individual readers approximate as well as possible the lifespan, which he considers to be roughly the same as that given by many contemporaneous medical writers, around 120 years. Certain authors whom Gruman considers apologists, even Galen, may have been committed to a similar goal.[33] If "apologist" and "prolongevist" oppose one another over human intervention in the delay or mitigation of senescence—which it seems as though they would if apologists are identified by their defense of old age as natural and inevitable—I am not sure that many so-called apologists were not moderate prolongevists.[34] Physicians such as Joubert and Fernel endorse hygienic regimens and other medical practices tied back to Galen's theorems and precepts that they believe can influence aging in some

[32] Charles Webster, *The Great Instauration: Science, Medicine, and Reform 1626-1660* (London: Duckworth, 1975).

[33] Gruman, 22. Gruman does admit, however, that there is "no obvious reason why Galen's theory of aging should exclude the possibility of prolongevity."

[34] Thus, I reserve "prolongevity" for something more like Gruman's extreme version, which is often how the word is used now, anyway. For instance, some biogerontologists who ostensibly spurn the label of prolongevist nevertheless envision a modest increase in the maximum length of life and endorse endeavors to improve life expectancy and to eradicate the infirmities associated with old age.

way. Secondly, apologism is commonly associated with the doctrine that old age is not a disease. This doctrine, moreover, is generally ascribed to Galen and his successors.[35] In Part One, I try to demonstrate that for Galen and Galenists the relationship between old age and the category of disease was considerably more vexed than what apologism implies.

An apt example of the kind of historiography about which I speak is one of the most extensive and sophisticated reflections on gerontology to date, Stephen Katz's *Disciplining Old Age* (1996). Using the hermeneutical framework of Michel Foucault, Katz traces how gerontology became a discipline of study and the object of its knowledge, old age, a "problem" in the Foucauldian sense. His book offers many brilliant insights, but by privileging modernity, it exhibits a tendency common to Foucault. Although Katz acknowledges that Foucauldian research can "romanticize the past where it makes the premodern body a foil to modernity's medical gazes and disciplinary regimes," his first chapter would prompt just about anyone familiar with "premodern" (which includes the seventeenth and eighteenth centuries) medical texts to question why they do not exhibit the salient quality of the modern discipline of gerontology, which, according to Katz, is the "reinterpretation of disease through a new series of symptoms that constituted the aged body as a symbol of separation from other age groups."[36] Katz identifies among premodern "discourses of senescence" four features that distinguish them from modern medical theories of old age: "persistence of a humoral framework," "the noninterventionist role of the medical arts," "the enigmatic problem of the human lifespan," and "a blossoming optimism about human perfectibility."[37] He explicitly lumps Francis Bacon among premoderns and discusses his ideas for several paragraphs.[38] As I try to illustrate in Part Two, however, Bacon directly challenges humors as the source of senescence; he demands that the medical arts intervene in the course of aging; and

[35] See, for example, Gruman, 22.

[36] Katz, 40.

[37] Ibid., 38-39.

[38] Ibid., 35-36.

though certainly intrigued by natural histories of longevity, he entreats skepticism about their wilder stories and rejects outright the assumption undergirding many of them that in the ancient past humans lived fabulously longer lives. Of Katz's four features, Bacon clearly exhibits only one, an optimism about human perfectibility, which he does in spades, but so do more recent biogerontologists, such as the current Cambridge-based researcher Aubrey de Grey.[39]

On the other hand, Katz notes three elements common to modern gerontology that distinguish it from premodern discourses of senescence. These elements all pertain to conceptions of the aged body: the signs on its surface came to signify causes of disorder inside rather than outside it; it became a separate "articulation point" of pathologies requiring therapy; and death came to take on a traceable and predictable presence within it, making old age a process of dying.[40] As guideposts for thought, these elements prove more troublesome than those Katz associates with premodern discourses, for not only Bacon's but many of the gerontological theories I cover in Part One include them to varying degrees. In premodern theories of senescence, signs on the exterior of the body point emphatically inward, although predmodern theories generally do allow more avenues of exchange with external forces than late-modern ones, and the aged body already is a cynosure of pathologies and a prelude to death. Such an account of premodern gerontologies demonstrates the need for a larger and more diverse articulation.

The Question of Desirability (Part Three)

Part Three of the dissertation expands the sense of the "prolongation of life" used in Parts I and II. Instead of focusing upon the extension of life to the natural limit either of the individual or of the species, it considers, additionally, the attainment of longevity understood by early moderns, as it usually is by us, as a life extending into old age even if old age is thought to occur at some point well

[39] In *Ending Aging* (New York: St. Martin's Press, 2007), de Grey expounds seven Strategies for Engineering Negligible Senescence (SENS). His intention is to eliminate senescence as a cause of infirmity and death.

[40] Ibid., 40-42.

short of the longest term a person might live. The reason for the magnification of my purview is to cull more arguments, questions, and assumptions employed by early moderns that relate to the desirability of long life, the normative subject of Part Three. A study concentrating exclusively on the desirability of prolongevity in the Renaissance would be limited largely to discourses about magic and alchemy, wherein controversy runs to extremes, true believers championing the most facile of dreams and naysayers retorting that the dream is impossible. A wider perspective enables us to pull in ideas that a large portion of early moderns shared about self-preservation, about death, and about old age, all of which influence how they confronted the question whether one should prolong life.

Francis Bacon stands as the crux between the chapters examining that question and the previous chapters about the possibility of prolonging life. In passages from *The History of Life and Death* and *De Augmentis*, Bacon challenges theological and ethical objections that he suspects contemporaneous readers of his work will put to his plans for prolongevity; however, as I attempt to demonstrate, the protests that Bacon envisions as well as the confutations he offers in return pertain not so much to concerns specific to extending the lifespan beyond a historical limit as to the advantages or disadvantages of long life more generally. Thus, Bacon provides entrée into the subject covered by Part Three. In the corpus of criticism on Bacon, there exists no analysis of the arguments that he deploys to justify the prolongation of life, and my own analysis also foregoes other reasons Bacon may have had that do not factor into his express apologies in *The History of Life and Death* and *De Augmentis*. In these passages, however, he negotiates long, complex traditions of both classical ethics and Christian soteriology. Ultimately, as I argue, Bacon grounds the goodness of prolonging life in the natural law of self-preservation, an idea with roots in Aristotelian and Stoic philosophy, despite his avowals of Christian charity. Alongside nature's provocation to longer life, he also arranges hierarchically other ideas and beliefs that impinge heavily on early modern discourses about longevity, including Stoic indifference to length of life based on the transcending supremacy of the moral good as well as scriptural and theological admonitions to disdain earthly life and use suffering as a means to sanctification. Truly, the classical and theological opinions that

Bacon collects warrant their own chapters, but I hope that the compressed treatments that I give them in this and the two subsequent chapters will be adequate to the analysis contained in each.

The next two chapters, the first on Edmund Spenser and the second on Ben Jonson, subsume some of the same opinions yet demonstrate how two writers with presumptions and rhetorical purposes very different than Bacon's approached them. My discussion of Spenser divulges a theological position that Bacon ignores, which is that the body's aging process itself might be a divinely ordained benefit to mankind, whereas the final chapter, on Jonson's Cary-Morison Ode, exposes the many conflicts between Stoic apathy toward length of life on the one hand and Christian enjoinders against suicide and for patience in the face of a debilitating old age on the other. Although, as I also show, both authors gesture at critiques of prolongevity, their presumption that prolongevity is impossible induces them to imagine senescence as a necessary concomitant of longevity in a more ordinary sense.

With prolongevity ruled out, writers like Spenser and Jonson considered old age an inevitable consequence of living longer, but such an expectation still permitted wide berth for interpreting the rate of old age and its particular features. As many gerontologists observe, most cultures have possessed and simultaneously maintained two views of old age, variously cast as positive and negative, strength and frailty, optimistic and pessimistic, upward progress and downward decay, or blessing and curse. The historian Thomas Cole, who has written some of the most influential studies about changing perceptions of old age, traces modern ageism back beyond the simple upholding of the negative view to the rupture between the two views caused by modern science, which until recently has tended to track almost exclusively the "inevitable declines in physiological capacity."[41] Cole sees "late Calvinism," which maintained positive and negative views in a creative tension, as crucial to the development of modern assumptions about old age; however, as I hope will become intelligible in Part Three, some of the same concerns and opinions about senescence that Cole

[41] Thomas R. Cole, "The 'Enlightened' View of Aging: Victorian Morality in a New Key," in *What Does It Mean to Grow Old?*, ed. Thomas R. Cole and Sally A. Gadow (Durham, NC: Duke University Press, 1986), 127.

ascribes to late Calvinism were already potent in early modern discourses about aging, in particular the creative dichotomy between the "inevitable losses and decline of aging" and the "hope for life and redemption."[42] That dichotomy, however, affected more than early Calvinistic attitudes, which possibly one may detect in Spenser's *Fowre Hymnes* or *Faerie Queene*; Jonson exploits the same tension in a very different manner in the Cary-Morison Ode.

Additionally, if in the twentieth century natural science began to elevate and reinforce the negative view, the contrast with early modern medicine is all the more striking. Early moderns discussed the debilities of senescence not only in terms of values like good or bad but natural and unnatural. A common discourse about aging held that the many of the worst pains and ailments associated with it resulted from optional behaviors rather than from the intentions of nature. Cornaro pushes this doctrine to the extreme, but, since Aristotle, many philosophers and medical writers maintained that a genuinely natural old age ended in painless death. Renaissance conceptions of aging serve as test-cases for the debate between recent scholars attending to embodiment. Michael Schoenfeldt has challenged Gail Kern Paster's argument that Renaissance authors conceived the body's fluxes as threats to the integrity of the self by demonstrating that they often speak instead of the self as defined by control of the body.[43] As Thomas Cole notes, aging post-maturity provides a "constant reminder of the limits of physical self-control."[44] If one could determine whether early moderns viewed the loss of self-control associated with senescence as the result of the body's necessary alterations or as the will's failings, then one could choose between the views of Paster and Schoenfeldt. Not coincidentally, Joubert considers that question in the dedicatory epistle of *Popular Errors*, before broaching the topics of medicine's utility and the prolongation of life. Joubert comes down on the side of the mind's sovereignty over the body; however, for many other Renaissance

[42] Cole, "'Enlightened' View," 120.

[43] Gail Kern Paster, *The Body Embarrassed* (Ithaca, NY: Cornell University Press, 1993); and Michael Schoenfeldt, *Bodies and Selves in Early Modern England* (New York: Cambridge University Press, 1999), especially page 15.

[44] Cole, "'Enlightened' View," 121.

writers the solution remained obscure and inconsistent, as my own fledgling discussions of the topic in Chapters 9 and 10 illustrate.

Though separated from Part Three, the question of the possibility of prolonging life casts a long shadow, influencing the normative question too. Obviously, if one presumes prolongevity to be impossible, one already has the best reason not to seek it, and during the Renaissance that argument is common to alchemical satire and tracts rebuking Paracelsus.[45]

The admonition to refrain from the impossible may apply to any form of the prolongation of life, however. When debating whether medicine can extend life, Joubert eventually circles back to divine providence. Life cannot be prolonged to any degree, according to him, without the favor of God. Likewise, other Renaissance medical writers deny the ability of medicine to prolong life if that means to cross the term fixed by God for each individual or for the human race. The question whether one can prolong life reflected the broader concern in the Renaissance about whether human intervention into nature alters the will of God. I discuss more about that connection in Chapter 8, on Bacon. The concern is especially intense in relation to human lifespans because of the prime position humanity was thought to occupy in the cosmos. Renaissance learned physicians worried little about thwarting divine interdicts when healing and preventing diseases but balked, as Joubert does, at the ability of art to prolong life beyond natural terms. Of course, physicians always could make verbal gestures of retrospective piety, insisting that the success or failure of their work manifested divine will, just as medical apologists claimed that their art did nothing but enable nature to accomplish her effects. Joubert, for instance, repeats the Erasmian defense that medicine represents the charitable work of God. However, physicians' reverence for the natural lifespan was of a different order.

In the Renaissance, persons other than learned physicians—lay empirics, clerics, theologians, poets—may have harbored much graver doubts about the ability of bodily arts to do anything to change the will of God even when healing acute disease, and certainly the many failures of physic

[45] Two examples are: Henry Cuffe, *The Difference of the Ages of Man's Life* (London, 1607), 71; and James Hart, *Κλινικη, or the Diet of the Diseased* (London, 1633), I.4-10.

must have contributed to such doubts as did possibly, among reformed Protestants, the Calvinist doctrine of God's universal, micromanaging grace. But by and large these other persons too scoffed at attempts at prolongevity.

The outlook that Jonson and Spenser shared about long life I think would have been the predominant one in the Renaissance, given scriptural asseverations about the limits of human life like Job 14:1-2 and the pervasive belief that original sin introduced suffering and death into the world.[46] Nonetheless, from several quarters came avowals that the human lifespan may be expandable, based partly on a natural history of longevity that today sounds quite mythical and naïve. As mentioned, medical writers often took the maximum human lifespan as about 120 years, roughly the same as that which some biogerontologists now suppose and approximating the highest historical figure in modern records.[47] Joubert mentions the cap of 120 years explicitly, and the same number occurs in the title of Thomas of Ravenna's book. Additionally, Cornaro sets his sights on that mark in his final revision to *De Vita Sobria*. The physician James Hart affirms that, although immortality remains out of reach, by careful diet people can prolong their lives to as much as 120 years.[48] Likewise, in *An Apologie or Declaration of the Power and Providence of God in the Government of the World* (1635), the reverend George Hakewill quotes Trebellius Pollio as stating that the most learned "Mathematicians" (astronomers) cap the human lifespan at 120 years.[49]

As evidence of lifespan, medical writers turned to pagan accounts of longevity that I shall discuss in a moment, wherein lives of historical persons nearing or surpassing 120 years are quite

[46] Job 14:1-2: "Man that is born of a woman is of few days, and full of trouble. He cometh forth like a flower, and is cut down: he fleeth also as a shadow, and continueth not." Thomas Cogan, for instance, quotes these lines in *The Haven of Health* (London, 1584), 194. Both Augustine and Thomas Aquinas maintained that original sin, resulting in the removal of the Tree of Life, introduced senescence in addition to death. See *City of God*, XIII.19 and *Summa Theologica*, Pt. 1, Q. 97, Art. 4. According to Augustine and Aquinas, if Adam and Eve had not sinned, they would have been translated out of Eden, into heaven.

[47] As of this writing, the longest documentable life belonged to Jeanne Louise Calment, who lived 122 years and five months (1875-1997).

[48] Cornaro, 47; and Hart, I.5.

[49] Hakewill, III.175.

numerous. But they also had a scriptural basis, though an ambiguous one. Genesis 6:3, which describes humanity just before Noah's Flood, reads, "And the LORD said, My spirit shall not always strive with man, for that he also is flesh: yet his days shall be an hundred and twenty years." In the Renaissance, most biblical commentators interpreted the verse as referring not to the human lifespan but to the interval that God allows before he destroys the world by deluge. Such was the construction made by Jerome, Chrysostom, John Calvin, the glossers of the Geneva Bible, and many later commentators.[50] Nonetheless, by cautioning readers, Renaissance glosses on the verse perhaps indicate a propensity to read it "wrongly" as concerning lifespan, an interpretation that Calvin blames on Lactantius. Andrew Willet rebukes two other commentators for that misconstruction as well.[51] If the 120 years designates the lifespan, it could imply, first, a longer antediluvian lifespan, clipped in the time of Moses, who supposedly voiced the new measure for humanity in Psalm 90:10: "The days of our years are threescore years and ten; and if by reason of strength they be fourscore years, yet is their strength labour and sorrow; for it is soon cut off, and we fly away."[52] Or, it could designate the maximum amount of life available to mankind versus what we call life expectancy, given in Psalm 90. Hakewill, citing Calvin, makes that rather sophisticated-sounding distinction and asserts that Pollio considered the findings of learned mathematicians as confirmation of Genesis 6:3.[53] Medical

[50] The *Glossa Ordinaria* provides another example. Later commentaries reading the verse in this manner are: Henry Ainsworth, *Annotations upon the First Book of Moses Called Genesis* (London, 1616); Nicholas Gibbons, *Questions and Disputations Concerning the Holy Scriptures* (London, 1601); Alexander Ross, *An Exposition on the Fourteene First Chapters of Genesis* (London, 1626); and Andrew Willet, *Hexapla in Genesin* (Cambridge, 1605). Willet attributes the interpretation to Jerome and Chrysostom, but I have not confirmed his claim. Usually, under this construction, the 120 years are taken as a time allotted by God for humanity's repentance. Arnold Williams discusses these and other early modern biblical commentaries in *The Common Expositor* (Chapel Hill: University of North Carolina Press, 1948). The editors of *The New Oxford Annotated Bible* (Oxford: Oxford University Press, 2001) reserve judgment between interpretations but lend more credibility to the lifespan interpretation than do most Renaissance commentators, noting that Genesis 6 "illustrates the kind of breaching of the divine-human boundary which the LORD God feared in 3.22" (18).

[51] John Calvin, *A Commentarie of John Calvine, upon the First Booke of Moses called Genesis*, trans. Thomas Tymme (London, 1578), 173; and Willet, 75. The two commentators impugned by Willet are Tostatus and Rupertus.

[52] Confusing matters further, scriptures gives yet a third calculation of lifespan at Ecclesiasticus 18:9: "The number of a man's days at the most are an hundred years."

[53] Hakewill, III.175, 177. Nonetheless, Hakewill himself endorses the more frequent conclusion about Genesis 6:3. Overall, his point seems to be that lives of seventy or eighty years have been remarkable ever since the days of Moses, confirming Psalm 90's estimate as the "ordinary course," although some extraordinary persons may survive till even greater ages. Like Francis Bacon, upon whose natural history he heavily relies, Hakewill credits stories of persons reaching upwards of 120 years and somewhat beyond. I discuss this aspect of Bacon's natural history in Chapter 6.

writers may have used the verse similarly. Thomas Wright, at least, does so in his treatise *Of the Nature of Climacterical Years*. According to Wright, the 120-year-span receives additional scriptural confirmation from the death of reputed author of Psalm 90, Moses: "And Moses went and spake these words unto all Israel. And he said unto them, I am an hundred and twenty years old this day; I can no more go out and come in." Moses died the same year.[54]

Classical histories of human longevity plus contemporaneous lore about superlongevous persons raised the possibility that the full human lifespan had not been realized and may exceed the 120 years supposed by medical writers. The most important of the classical sources was Book 7 of Pliny's *Natural History*, which provided the Renaissance with much information about the lifespans of animals and historical figures. Book 7 includes extraordinarily long-livers as an important subset of prodigies and monsters and features a larger selection of truly extraordinary long-livers than two other important classical sources, pseudo-Lucian's *Macrobii* and Censorinus's *De Die Natali*.[55] The Renaissance added cases to this preternatural history. The Wandering Jew was thought to have been walking the earth since the time of Christ. Alchemists such as Roger Bacon and Paracelsus took inspiration from the example of Artephius, who used the magisterium to survive till the age of 1029. More widely cited, Johannes de Temporibus, or John of the Times, reportedly lived 361 years, from the days of Charlemagne till the reign of Emperor Conrad II.[56] England produced two of its own famed examples of long-livers, Katherine Fitzgerald, Countess of Desmond (mentioned by Walter Raleigh, Francis Bacon, and Hakewill), who died in 1604 or 1614 allegedly at the age of 140; and

[54] Deuteronomy 31:1-2 and 34:7. Thomas Wright, *Of the Nature of Climacterical Years* (London, 1604), 2-3.

[55] Pliny, *Natural History* VII.48-50. Using Roman censuses, Pliny records several lives of over 120 years, some reaching 150. Like Hakewill and Bacon after him, Pliny doubts the accuracy of records about Arcadian kings, some of the longest-live persons whom he lists. If I had more space and time, my dissertation would include greater discussion of how records of longevity were collected, interpreted, debated, and transmitted before Bacon.

[56] For all of these stories, see Hakewill, III.180-182. Two modern historical studies written about the legend of the Wandering Jew are: George K. Anderson, *Legend of the Wandering Jew* (Providence, RI: Brown University Press, 1965); and Galit Hasan-Rokem and Alan Dundes, eds., *Wandering Jew: Essays in the Interpretation of a Christian Legend* (Bloomington, IN: Indiana University Press, 1986). Francis Bacon lists both Johannes de Temporibus and the Countess of Desmond in the section of *The History of Life and Death* titled "Longaevitas et Brevitas vitae in Homine." Raleigh claims personal acquaintance with the Countess of Desmond in his *History of the World* (London, 1614), I.v.5. In *The Wise Vieillard* (trans. Thomas Williamson; London, 1621), Simon Goulart cites several French histories for accounts of Johannes de Temporibus (14).

Thomas Parr, who in 1635 died at the reputed age of 152. Parr's story may testify to the esteem in which the English people held longevity at the time as well as the credence once given to cases later discounted. A poem by John Taylor celebrates Parr for achieving his great longevity through a simple life of honest pleasures, hard work, and regular diet, and although a poor, otherwise nondescript countryman of Shropshire, he was buried at Westminster Abbey beneath a gravestone reading that he had "lived in the reigns of ten kings."[57] Additionally, William Harvey performed Parr's autopsy. Writing about his findings, Harvey takes Parr's reputed age as fact yet expresses amazement that the body of such an old man could remain so well preserved.[58]

Extravagant longevity represents an instance of the miracles and monsters naturalized, as Lorraine Daston argues, during the development of Enlightenment science.[59] By the end of the nineteenth century naturalization had led to incredulity. The prolongation of life enticed many Victorians as a subject of scientific inquiry and imaginative fiction, and as late as 1857 a record of vital statistics took for granted cases like those of the Countess of Desmond and Thomas Parr.[60] Yet sometime afterward abnormal longevity began to meet with more intense skepticism. The story of Thomas Parr was finally discredited by William Thoms in 1873. Thoms's argument subtly registers his culture's imperatives about aging and nature. It relies less upon demonstrable facts refuting the authenticity of the earliest records than upon the lack of other records confirming them.[61] Moreover, it builds from an assumption contrary to that of many early modern natural philosophers, who were

[57] John Taylor, *The old, old, very old man: or, The age and long life of Thomas Parr* (London, 1635). Temperance was usually credited for the long lives of the Countess of Desmond and Johannes de Temporibus as well.

[58] William Harvey, "Anatomical Examination of the Body of Thomas Parr," in *The Works of William Harvey, M.D.* (London: Sydenham Society, 1847), 587-592. Harvey attributes Parr's death to "a sudden change in the non-naturals," especially air and food, after Parr, now famous, was brought out of the country and into the city as a kind of spectacle.

[59] Lorraine Daston, "Miraculous Facts and Miraculous Evidence in Early Modern Europe" *Critical Inquiry* 18 (1991): 93-124.

[60] Thomas Bailey, *Records of Longevity, with an Introductory Discourse on Vital Statistics* (London: Darton and Company, 1857), 142 and 291-294.

[61] William J. Thoms, *Human Longevity, Its Facts and Its Fictions* (London: John Murray, 1873), 85-94. Thoms similarly debunks traditional stories of the Countess of Desmond (94-101) and Henry Jenkins, who supposedly lived 169 years, dying in 1670 (67-84).

wont to interpret aberrations as evincing the flexibility of nature. Instead, according to Thoms, the regularity of nature discredits aberrations.[62] The disparity between Renaissance and Victorian treatments reveals that the lifespan stands for more than "biological fact." As Stephen Katz contends, lifespan is also a "discursive or imagined production, symbolic of a culture's beliefs about living and aging, and thus serves as a conceptual window onto the larger social and epistemological orders from which such beliefs derive their significance."[63] The relative credulity of Renaissance histories of longevity thus signifies the epistemological assumptions held by certain kinds of thinkers, whereas the emphatic denials of transcending the 120-year limit conceal values of other kinds.

As a final point, an intentional limitation on my topic, which most broadly defined is the cumbrous and diffuse opposition of life and death, frames the prolongation of life by transit in a single, earth-bound body. My dissertation does not concentrate on other, more mediate ways an individual's life may be extended, such as by divine resurrection, worldly fame, metempsychosis, memory, progeny, and artistic representation. Like most delimiters on subjects of thought, this one is meant to facilitate the processes of comparison and division; however, in so doing, it necessarily sacrifices some points of contact with more distant but no less related and potentially illuminating ideas. For early moderns, especially in their ethical and religious discourses, questions about prolonging life in the medical sense fit within a network of beliefs and expectations that joined the full variety of the term's other senses. Although my focus does not narrow to any one of these alternative meanings, it nevertheless widens to include several. As evident in Chapter 8, any consideration of the theological implications that prolonging life carried for early moderns is remiss if it does not engage their ideas of the afterlife, whereas Jonson's Cary-Morison Ode, discussed in Chapter 10, involves not only a heavenly afterlife but also the longevity offered by fame and art. In

[62] Thoms, 90.

[63] Katz, 39.

such cases, however, my analysis starts with the medical sense of life and draws in alternative senses as the authors examined interpose them. A robust comparison lies outside the scope of this project.

My chapter on Jonson touches upon another issue that a more thorough-going literary analysis would develop, which is poetic vitality. What for Jonson constitutes a piece of writing's liveliness or vigor or reflects the youthful energy of its author merits greater elaboration than I am able to give it here. Moreover, other early modern poets offer different conceptions that I altogether ignore, many informed by the kind of Neoplatonic cosmology and physiology discussed in Chapter 2. Again, I think that a focus on the medical sense of life justifies the curtailment of discussion about the issue. Nonetheless, I can imagine and eventually may wish to pursue another project about this and other "vital" metaphors pervasive during the Renaissance, or what we probably would call metaphors but in the Renaissance usually verged closer to identities; for instance, the life of the state and other human corporations (e.g., Machiavelli and Thomas Hobbes), the life of the body of knowledge (e.g., Francis Bacon), and the life of the world, or nature (e.g., John Donne and Hakewill). In all of these cases, longevity serves a measure of success, an aim, or an axis of contention.

PART I

INTRODUCTION

This first part of my dissertation serves two purposes, both oriented by Francis Bacon, the subject of Part Two. The first purpose of Part One is corrective. Although I tend to agree with Bacon when he declares himself the first to fit the prolongation of life beneath the art of medicine—in the peculiar senses he intends "the prolongation of life" and "art"—his confutations of preceding radical moisture theories, though generally convincing, tend to obscure the variety of those theories and the problems and questions engaged by the thinkers who developed them. Therefore, this first part also tries to restore something of their original detail and complexity. This task is crucial, for a common perception prevails whereby classical, medieval, and early modern gerontology is apologetic toward old age. This view is mostly accurate—about as accurate as such a general claim can be—so long as "apologism" is set against the most ambitious kind of "prolongevitism." Looked at from within their own "natural" perspective, however, so-called apologists allow for a great deal of defiance. Apologetic does not equal helpless. Many of the most famous classical, medieval, and early modern philosophers and physicians who tried to justify old age as a necessary and positive good of nature also sanctioned means of ameliorating it and of postponing its onset. This first part of my dissertation tries to capture something of the inducements, pathways, and limits to their arguments for remedying old age.

The second purpose is to lay a foundation for the argument of the next. The overarching argument of Part Two is that Francis Bacon was the early progenitor of biogerontology, a contention I support for three reasons: he separated out senescence as an object of study distinct from disease; he posited a theory of senescence deeply rooted in the universal actions and structures of matter; and he called for future experiments to improve his theory, including experiments in therapy. Before Bacon,

I claim, no one united those three endeavors. I hope that the examples of natural philosophy and medical theory that I have included in Part One also will illustrate tendencies prior to Bacon to elide in theory, practice, or both, senescence with disease (and, conversely, vigor with health); to explain vitality through some anomalous substance or power, usually with the effect of severely restricting the remedy of senescence; and to suppose a theory of senescence grounded in indisputable premises, sometimes even to take that theory as an *a priori* given. For a natural or medical theory to approach anything like modern biogerontology, at the very least it would have to hold senescence in question, asking what and whence it is. Therefore, in the selection of my examples, I have tried to avoid a tendentious stacking of the deck by choosing prominent theories that ostensibly meet the first criterion of distinguishing senescence from disease (or vigor from health) when they speak about each object of the pair as a distinct thing. Nonetheless, in most cases, either the separation collapses when applied to therapeutic prescriptions, or it is used to obviate medical treatment of senescence altogether. If a theory meets the first criterion that I argue Bacon meets, it fails to meet one of the other two. In fact, most theories of senescence before Bacon are "vital substance" theories that posit senescence as a nearly intractable fate and a mystery insoluble by practical knowledge.

Part One proceeds mostly in a chronological order. Because ultimately it points to Francis Bacon and the medical tradition when he inherited it, Chapter 1 begins with a brief glance at a certain idea dominant in the early modern period about old age as a physical phenomenon. Evident in imaginative literature in addition to medical textbooks, this commonplace but coarse-grained image of old age points to highly developed gerontologies that explicate it, which are found most fully developed in medical texts. My subsequent survey of these theories of senescence extends through two chapters.

Oriented by the early modern period, the rest of Chapter 1 analyzes the ideas espoused by thinkers who dominated early modern medical schools although they were not early moderns themselves. Its analysis covers Galen, Avicenna, and a few later Scholastic commentators and physicians. I hope that an historical order will enable developments to the concepts of vital heat and

innate or radical moisture to stand out; however, I do not review these theories here in order to represent classical paradigms in their progress to medieval paradigms and medieval paradigms in their progress to Renaissance paradigms but to analyze ideas collected into Renaissance theories and still operative in Renaissance theories. I have thought it better to go to the sources, because, when it comes to the subject of senescence, many early modern medical writers gesture toward Galen and Avicenna without much elaboration of their ideas. Questions especially important here are whether innate heat is elemental fire, as represented in the increasingly common metaphor of life as a burning lamp, and why the body necessarily dries out in age.

Chapter 2 examines early modern theories proper. Because the Galenic tradition still dominated physiology and medical therapeutics, I have decided not to re-hash the same doctrines already heard but to concentrate on innovations, particularly those innovations along, for lack of a better word, Neoplatonic lines. Later complications to the Galenic-Arabic tradition I hope will become more apparent in Part Three where I discuss early modern medicine again. Here, I do not purport that such concepts as a world-soul, cosmic *pneuma*, and natural magic began in the Renaissance; however, their increased prevalence within early modern intellectual culture as a whole warrants a closer look at their fitness with, departures from, and alterations to the expanding medical tradition. The three theories I have chosen for Chapter 2 differ from one another in important ways and are all elaborated by writers with whom Francis Bacon expresses familiarity—Jean Fernel, Marsilio Ficino, and Paracelsus. Although Fernel was born six decades after Ficino, I have opted to begin Chapter 2 with him, because his attempt to adapt Neoplatonic and occult notions to the Aristotelian-Galenic tradition is most thoughtful and candid. At least three writers whom Bacon foten mentions, Girolamo Cardano, Luigi Cornaro,and BernardinoTelesio, do not appear here because of their importance to Parts Two and Three. When possible, I have tried to avoid redundancy.

CHAPTER 1

SENESCENCE IN THE PRE-RENAISSANCE MEDICAL TRADITION

Section (a): Introduction

Today, gerontologists like to distinguish chronological age from biological age. Chronological age refers merely to the time on the clock, so to speak: *he is seventy years old*. Biological age refers to bodily changes expected according to some supposed norm: *she is seventy years old but has the heart of a teenager*. Early moderns marked the same difference between time and natural process but without the scientific-sounding Greek terms and perhaps too with an even more elusive sense of a norm. In fact, as I note in Part Two, Francis Bacon complains of the imprecision of the word "age" wrought by its overuse to mark time rather than a physical process. But many early moderns besides Bacon used the word to denote physical changes, too, often those changes associated with old age. It is a custom of English speakers going back at least as far as the early modern period to speak of the way up to the apex of some perceived developmental arc as "to grow" and "to mature" rather than "to age" and to reserve the latter expression to speak of the way down when one needs a euphemism in place of "to shrivel" or "to rot," the logical opposites of the other verbs.

About the timing of old age—its onset and duration—generally, early moderns speak, as we do, without perfect regularity. Norms shift depending on person and context. As Creighton Gilbert has observed, early modern writers often declare themselves old at forty.[1] That limit, however, usually supposes a simple opposition between "youth" and "age." Health manuals and works of natural philosophy commonly list the stages of life and assign them rough limits, but the placement of

[1] Creighton Gilbert, "When Did a Man in the Renaissance Grow Old?" *Studies in the Renaissance* 14 (1967): 7-32.

"old age" varies with the number of stages in each scheme. Probably, the most frequent totals are three, four, six, and seven stages, and "old age" often falls around age sixty but sometimes not till seventy or eighty. Old age itself is frequently divided into three stages: "green" old age, when the body's powers begin to wane but the intellect and senses remain sound; senility, when even thought and perception weaken; and "decrepit" old age, the debilitating threshold of death.

More determinant than temporal calculations were the appearance of physical signs associated with old age. In the thirteenth century, a little before the era in question, Roger Bacon compiled a convenient list:

> grey hairs, paleness, wrinkles of the skin, weakness of faculties and of natural strength, diminution of blood and spirits, bleareyedness, abundance of rotten phlegm, filthy spitting, shortness of breath, anger, want of sleep, an unquiet mind, hurt of [the senses].[2]

Early modern texts continue to note many of the same features. Especially prevalent in their descriptions are hoariness of the hair, wrinkles, weakness of the limbs and faculties, and the impairment of the senses, particularly vision. Because of humoral and spiritual doctrines, some of these material changes also were thought to alter the mind, especially the outbreak of fear and covetousness through the build-up of wet, cold phlegm.

For recent biologists, the obvious signs of old age have proven frustrating predictors of biological age. Several of the signs in Roger Bacon's list are commonly recognized by us today, but some of the most common, such as wrinkles and muscle atrophy, appear at such widely different intervals and rates that they do not offer reliable comparisons. The sources of old age lie deeper. To plumb these, biogerontologists generally have traced features harder to detect, such as the accumulation of arterial plaque, the decrease in the size of the thyroid, a drop in hormonal levels, or the increase in mitochondrial free-radicals. In fact, the history of modern biogerontology has been marked by successive attempts to establish a sign or group of signs as the key of senescence, the core

[2] Roger Bacon, *The Cure of Old Age and the Preservation of Youth*, trans. Richard Browne (London, 1683), 22-23.

changes that trigger all the others. So far, no one has been able to posit a solution that has satisfied everyone else.

Modern biogerontology suffered for years from charges of illegitimacy because it could not express clearly the object of its study. Instead of senescence, it was charged, what biogerontologists were studying were specific diseases to which people become more susceptible with advancing years, and specific diseases belong properly to the arena of pathology.

Of course, the obvious rebuttal to this charge is that biogerontology tries to understand *why* human beings become more susceptible to diseases in advanced years. Aging is a matter of biology, not just of pathology. As a science, biogerontology gained much greater credence when a leader in the field, Leonard Hayflick, falsified the then-dominant view that somatic cells, not just germ cells, are immortal.[3]

Although biologists have not determined all the microscopic particles and processes driving senescence, they have searched for them beginning with a basic sense of what old age is as a physical phenomenon, and it is this basic sense of old age that modern biogerontologists—and most of us, too, I suspect—share with early moderns, who also sought the root of old age beneath its multiform appearances. In this anticipatory sense, Hayflick defines "aging" as "losses in normal function" that start sometime after maturation and continue till death.[4]

The weakness of faculties and physical strength is one of the signs of old age noted by Roger Bacon. It also demarcates the three parts of old age—green, senile, and decrepit. For early moderns, decline of vigor represented the linchpin of the other signs and the clue that any analysis of senescence would follow.

Erasmus, for instance, contracts old age to this point in his "Carmen ad Guilelmum Copum Basileiensen de senectutis incommodes," or "Song to Guillaume Cop of Basel, on the inconveniences

[3] Leonard Hayflick and Paul S. Moorhead, "The Serial Cultivation of Human Diploid Cell Strains" *Experimental Cell Research* 25 (1961): 585-621.

[4] Leonard Hayflick, *How and Why We Age* (New York: Ballantine, 1994), 15.

of old age," a text meriting close inspection.[5] Erasmus wrote this verse epistle, it is thought, in 1506, when approaching his fortieth birthday. Cop was a physician, a suitable recipient of a poem about what Erasmus refers to as a "monstrous disease" [*morbus ingens*] (8). The poem uses the brevity of life and inevitability of death as goads for deeper religious commitment. At first wistful about his passing youth, Erasmus laments all the *commoda* that his growing years trammeled up: *Formam, statum, colorem, / Partem animi memorem cum pectore, lumina, somnos, / Vires, alacritatem* (15-18). It is the penultimate advantage—"*vires*,"or force, power, strength—that the poem stresses as it continues.

Although, as Erasmus says, the stag and the crow may live for many centuries while still enjoying their vigor [*vivunt / Tot saeculis vigentque*]—an idea proverbial in the Renaissance and rooted in Hesiod's fragmentary *Precepts of Chiron*—"man alone, after three and a half decades, and those hardly lived out at all, is thenceforth worn out and deprived of bodily strength by withered old age" (41-45). "Bodily strength" [*corporeum robur*] is only the first kind of strength to fade, however. Before the end of a man's fifth decade, old age assails also "the sacred sinews of his inner nature" [*ingenii sacros…nervos*]—sacred, because they correspond to the immortal part of man, the soul; "if we give credence to the esteemed Aristotle," that is. In other words, after sapping bodily strength, old age corrodes the power of the senses, memory, and understanding. The proviso about Aristotle is meant to elicit from contemporary readers an alternative interpretation more widely accepted by Christians, namely, that old age withers the instruments of the immortal soul, not the immortal soul itself (a point even Aristotle may actually have agreed with). Either way, the emphasis remains on the decline of strength, first of the brute strength of limb that the word *robur* indicates and then of the faculties of the mind.

Near forty, Erasmus wonders at and feels [*mirorque sentioque*] very suddenly the results of old age's slow, imperceptible progress. What he feels, he says, is his "strength [*vires*] suddenly

[5] Text and translation are from *Collected Works of Erasmus*, vol. 8, ed. Harry Vredeveld (Toronto: U of Toronto Press, 1974), 13-25

slacken"; he can "hardly believe that the time of [his] vigorous youth [*valentis…iuventae*] has already slipped by" (110-114). In lines proleptically echoing George Herbert's "The Forerunners," he then professes one of the common signs of old age, white hair, to be only a harbinger of old age. Erasmus worries that, because old age will rob him of physical and mental powers, the outcome that white hairs foreshadow, he must use his remaining time as best as possible—in prayer and service to God. Luckily, his own white hairs come while his mind remains firm and strong [*constantque vigetque*] yet the weakness of his body [*corporis pusillum*] does no serious injury. They announce

> only that the time of vigorous youth has slipped away […T]hey do not so much testify that barren old age is actually present as announce that it has speeded up its pace and is approaching from afar.
>
> [*Tempora duntaxat spatium effluxisse virentis / Iam clamitant iuventae / Nec tam praesentem iam testificantur adesse / Quam nunciant citatum / Ferre gradum et sterile procul adventare senectam.*] (197-203)

Similarly, the speaker of Herbert's poem seeks consolation against true senility, the approach of which his white hairs announce; its true condition is dullness, which threatens to extinguish the "sparkling notions" that infuse witty poetry. He comforts himself with the prospect that the memory of simple, unpretentious scriptural verse such as "Thou art still my God" will make him "livelier than before."[6]

The word *nervus*, which Erasmus uses in the phrase "sacred sinews of inner nature," quoted earlier, appears again when the poet realizes that the impossibility of halting the march of old age means that he should use his remaining time wisely. The call to action does not come until he has thoroughly enforced the point that old age cannot be stopped. As Erasmus says, one may restore riches and other material goods, but

> whatever of your lifetime strict Clotho has once and for all spun from her hanging spindles can never be recalled, not by the potions of Circe, not by the magical scepter borne by the son of Maia, not by the dire incantations of Medea together with the magic potions of the Thessalians—not even if the father of the gods himself were to sate you with nectar and ambrosial draughts (for Homer, that teller of tall tales, says that these nourish youth and ward

[6] "The Forerunners," lines 31-6, in *George Herbert: The Complete English Poems*, ed. John Tobin (New York: Penguin, 1991).

> off old age), not if the saffron consort of Tithonus should steep your body in invigorating dew, not if you, like Phaon, should ferry Venus three or even eight times from Chios across the waves, not if Chiron himself should apply to you all the herbs which the earth brings forth. No ring, no drugs hold onto our strength [*nervis*] and keep back the passing years. (126-143)

In the poem to Cop, we see Erasmus not only distinguishing obvious signs of old age from old age itself but also thinking of old age and youth as opposite ends of a spectrum. The spectrum measures vital power. Old age rises as the vigor of youth falls. When old age is fully present, youth is "barren" [*sterilem*]. Old age boils down to the loss of vigor manifesting itself in faculties of both body and mind. This strength is a vital force that grows after birth and shrinks before death. Old age is not its total loss, which in fact is death; nevertheless, there is for him, as there is for most of us, a point along the way at which he can say that the strength of youth has fallen from its height and another point at which he can say that old age is fully present.

The idea that youth signifies strength and old age the loss of strength was pervasive in the Renaissance. In 1538, another eclectic humanist, Juan Luis Vives, rendered the idea more prosaically than Erasmus. His chapter on old age in *De Anima et Vita Libri Tres* contains this definition: "Youth is as it were a kind of strength [*vigor*] and use of the perfection of the organs; old age is the loss; but the corruption and failure of the instruments is death."[7] The English physician Eleazar Duncon reiterates common phrasing when he refers to the prime of life as "the flourishing state and full strength of body."[8] Montaigne muses, "What fondnesse is it, for a man to thinke he shall die, for, and through, a failing and defect of strength, which extreme age draweth with it, and to propose that terme unto our life, seeing it is the rarest kind of all deaths, and least in use?"[9] William Gilbert writes that the loadstone, which attracts iron by its "primary native strength" [*vigor*], "loses some part of its attractive power, and, as it were, enters on the decline of old age, if it be too long exposed in open air

[7] Joannes Lodovicus Vives, *De Anima et Vita Libri Tres*, reprint (Torino: Bottega d'Erasmo, 1959), 118-9. The translation is my own.

[8] Eleazar Duncon, *A Copy of a Letter Written by E.D. Doctour of Physicke* (London, 1606), 8.

[9] Michel de Montaigne, *Essayes*, trans. John Florio (London, 1613), 177.

and not kept in a case, with a covering of iron filings or iron scales."[10] In *Nosce Teipsum*, Sir John Davies asks, rhetorically, "And what is strength, but an effect of youth?"[11] Like Erasmus, the Calvinist divine Simon Goulart surveys the symptoms of old age but concentrates on one. In his consolatory book *The Wise Vieillard* he warns: "Some waxe old sooner then others, some beare their age very well, some looke old and are not: So that old age must not be judged by the wrinkles in the fore-head, by the white haires, by the unwieldinesse and witheredness of the body." Yet, according to Goulart, "the older men are, the more weake and feeble they are in every thing they doe and take in hand."[12]

It is not surprising that the notion of old age as loss of vigor enjoyed great cultural currency in early modern Europe. Although I shall be discussing the further analysis of this notion by medical theories, I do not wish to imply that the idea surfaced and spread out of sophisticated medical theory. More than likely, it testifies to a common basis of experience underlying all parts of the culture, for the sign elaborated by medicine was not something hidden and totally removed from common experience but sprung luminously from its midst, so much so that today we give this same feature of old age pride of place. Early modern medical theories, however, may have helped cement a more ordinary impression.

The theories examined in this and the following chapter accord in their shared premise of youth as functional vigor and old age as the loss of that vigor. All of them, with the possible exception of Paracelsus, the last example, also agree in their analysis of bodily vigor as, more precisely, a kind of heat, an idea inherited from classical sources. In the Hippocratic text *On the Nature of Man* we learn that "a man is warmest on the first day of his existence and coldest on the last."[13] In Aphorism I.14, Hippocrates explains that this innate heat requires fuel, not unlike fire:

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[10] William Gilbert, *De Magnete*, trans. P. Fleury Mottelay (Mineola, NY: Dover, 1958), 105 and 32.

[11] Sir John Davies, *Nosce Teipsum* (London, 1599), 88.

[12] Simon Goulart, *The Wise Vieillard*, trans. Thomas Williamson (London, 1621), 23-4.

[13] *Hippocrates*, vol. 4, trans. W.H.S. Jones (Cambridge, MA: Harvard UP, 1943), 36-7.

"Growing creatures have most innate heat, and it is for this reason that they need most food, deprived of which their body pines away. Old men have little innate heat, and for this reason they need but little fuel; much fuel puts it out."[14] Food restores the balance among the four substances—blood, phlegm, yellow bile, and black bile—upon which health and life depend.[15] In the *Timaeus* Plato narrates a "likely story" in which life consists of "fire and air" and in which an "inner fire" [πυρὸς ἐντὸς] circulates through the body.[16] Aristotle pens probably the most influential remarks, though. He produced the earliest extant studies of aging and longevity, *On the Length and Shortness of Life* and *On Youth, Old Age, Life and Death, and Respiration*. In the latter, the Hippocratic notion of "innate heat" [έμφυτον θέρμον] becomes a "natural fire" [φυσικόν πύρ] ultimately responsible for all the effects of the soul because it drives digestion: "Now the other faculties of the soul cannot exist apart from the power of nutrition…and this depends on the natural fire, by the union with which Nature has set it aglow."[17] In accord with Hippocrates, Aristotle stresses life as a mixture of elements and qualities, especially warmth and moisture. Like any other fire, the natural fire of the body dies by exhaustion when it burns too long, drying out the material responsible for its own maintenance.[18] Yet in *De Generatione Animalium*, Aristotle, in contrast to Hippocrates, insists that the "vital heat" of the semen that initiates life and constructs the body "is not fire nor any such force"; rather, it is "the

[14] Ibid., 104-5.

[15] Ibid., 8-11.

[16] 77a and 46e, respectively.

[17] *The Complete Works of Aristotle*, vol. 2, ed. Jonathan Barnes (Princeton, NJ: Princeton UP, 1984), 474b10-12.

[18] Ibid., 474a25-474b24 and 479a8-30. These passages warrant closer scrutiny than they usually receive. Aristotle describes the self-destruction of the innate heat as an indirect process, comparable to Francis Bacon's depiction of senescence. More directly, the vital heat gutters out from a lack of refrigeration because over time the lungs become hard and dry and therefore cannot supply the air that the vital heat needs for cooling. Like Bacon, Aristotle points to a breakdown in the supply chain rather than to the exhaustion of a fuel. Aristotle, however, concentrates more on the death brought by decay than on the process of decay.

breath [πνεῦμα] included in the semen and the foam-like, and the natural principle in the breath, being analogous to the elements of the stars."[19]

By tracing theories of senescence, the following analysis often sounds like a history of the notion of vitality as heat, because, for Renaissance physicians and the thinkers upon whose ideas they relied, prolonging life against natural decay was a matter of keeping this heat at its optimum state, which also required understanding the fuel of this heat and how to supply it. My analysis differs from previous studies, though, in its emphasis on how variations upon the idea before and during the early modern period affected the medical treatment against senescence.[20] Or, better, how it affected the expectations and plans of treatments against senescence, for the texts available tell theories and prescriptions but perhaps not real-world practice.

Section (b): Galen

According to Galen, there are two means by which to prolong the lives of patients, just as there are two different modes of natural, inevitable φθορά, or destruction, of living things.[21] The first method for prolonging life is to moisten the parts of the body that dry over time. Their "drying" [ξηρότης] is the φθορά that Galen identifies as "senescence" [τὸ γηράσκειν]. The second method is to restore the body's substance and eliminate its waste. The substance is depleted and the waste amassed through the kind of φθορά that Galen refers to as a "flux" [ρύσις] induced by the body's natural heat. For Galen, and for most Renaissance physicians who reiterate his physiology and

[19] 736b20-35.

[20] I have in mind Everett Mendelsohn, *Heat and Life* (Cambridge, MA: Harvard UP, 1964) and two works by Thomas S. Hall, *Ideas of Life and Matter*, 2 vols. (Chicago: University of Chicago Press, 1969) and "Life, Death and the Radical Moisture," *Clio Medica* 6 (1971): 3-23.

[21] *De Sanitate Tuenda*, I.2. In this chapter Galen notes two kinds of destruction. The idea of the two methods of prolonging life emerges from the comparison with *De Marasmo* and should become clear in my analysis. In both texts, Galen uses the word φθορά and identifies senescence with drying. For translations of *De Sanitate Tuenda* I have used *Galen's Hygiene*, trans. Robert M. Green (Springfield, IL: Charles Thomas, 1951). For translations of *De Marasmo*, I have used Theoharis C. Theoharides, "Galen on Marasmus," *Journal of the History of Medicine* 26 (1971): 369-90. All Greek text comes from Karl Kühn, ed., *Opera Omnia Claudii Galeni*, 22 vols. (Leipzig, 1821-33).

therapy, the second method of prolonging life comes to vanquish the first. Using Galen's own writings, I would like to demonstrate the reasons that happens for him—and perhaps, too, for many Renaissance physicians. Galen's bifurcation of the natural φθορά leading to old age had far-reaching ramifications in later medicine and opened the chink into which to slip the concept of radical moisture.

The immediate effect of the bifurcation is to separate the corruption wrought by nature from the corruption wrought by disease. Like Francis Bacon, Galen insists that disease and senescence are distinct. Eventually all animals deteriorate through the first mode of natural corruption regardless of their constitution and condition of health. The first φθορά corresponds to what medieval and Renaissance writers sometimes call "natural old age." According to Galen τὸ γηράσκειν resembles the drying or "withering" of plants. The second φθορά does not correspond to the counterpart "accidental old age," but through the normal conduct of life it leads to it, just as it leads to ephemeral diseases. The "flux" of the body refers to the outpouring of bodily substances through the activities of life—through the consumption by vital heat and all the various functions it stimulates, through the elimination of waste, and through the action of the air. Eating, drinking, respiration, and the pulse replace substances lost (DST 7). If a living thing does not replace them, it quickly dies. It dies even faster if it is an animal, which contains a much stronger native heat than a plant. The destruction leading to this death represents the second φθορά of ρύσις. In the normal course of life, it also leads indirectly to diseases, for most of us seek to replace the substances lost. However, if to restore the body we ingest too much food, drink, or air or varieties of those unsuited to our constitution, age, or way of life, or if we fail to expunge wastes adequately, we suffer disease (DST 9). By "disease" Galen understands the conception that the medical tradition promoted for centuries afterward, a disequilibrium of substances caused by a faulty exchange between the living body and its environment (DST 5).

Galen's program of hygiene, outlined in *De Sanitate Tuenda*, is meant to prevent disease. Beneath that larger intention fit the objectives of replenishing substances lost and eliminating

excrements accumulated. But Galen names a third objective as well. It is "that the animal should not age prematurely." This third objective, however, "follows of necessity of those aforesaid," because if repletion and excretion are perfected, "an animal would be healthy and would flourish for a long time" (DST 9-10).

How, if the corruption by flux of substance is different from the corruption by senescence, can the flux cause the body to grow old faster? Galen's answer seems to be that when one does not maintain or recuperate a condition of health the imbalance in the qualities of materials retained can produce the effects of old age before the natural drying of the body would bring them about. Overall, it dries the body more quickly.

This second kind of old age plays a large role in Renaissance manuals of hygiene. An oft-repeated story tells of a young prisoner whose hair turned gray and whose color turned "wan, swartye, & deathlike" the night before his execution. In the earliest source I have found for this story, the Belgian physician Levinus Lemnius attributes the startling changes to the young man's "extreeme feare, and vehement thinking vpon that daunger wherewyth he saw himselfe distressed."[22] His imagination of impending doom

> so neerely touched him and so greuously perplexed his mynd, that al vital heat & spyrit was in him in a maner utterly extincte, whereby eche part of the body, streightwayes altered and chaunged from the fresh & comely colour which they had before, into an uglie and unsightly habite.

Lemnius connects the outward symptoms to the sudden dryness effected when the spirits suddenly abandon their office of stimulating the nourishment of parts:

> even as the Leaves of Trees, & the braunches of greene (Vynes seruing to defend the grapes from the iniury of weather) are by extremyty of heate, hayle, rayne, and Northren blastes, (which sometime blusterouslye blowe in the Sommer season) altered from a pleasaunt greene verdure into a yealowysh tawnie colour: So lykewyse the natural Complexion, Iustynesse, and shape of the body, drowpeth and decayeth, and the hayres (which of themselues are no part of the body, but an appentise, superfluitye and ornamente to the body) lackinge the strength and humyditye that nourisheth them, become hoarye and graye longe before their due time.

[22] Levinus Lemnius, *The Touchstone of Complexions* (London, 1576). The story appears at 91r-93r. I believe that Scaliger may be an even earlier source of the story, but I have yet to find his mention of it.

Lemnius depicts accidental old age. The sense that this is accidental emanates from the last phrase "before their due time." Many other medical writers of the Renaissance warn against foods, drinks, and behaviors that may dry the body before its "due time." The Italian physician Girolamo Cardano constructs an entire hygiene on the dampening of heat in order to prevent premature aging.

Such treatments, however, do not get to the processes of natural old age as portrayed by Galen, and in fact the accidental old that such treatments address may not share the same causes as natural old age, only some of the same symptoms.[23] When attempting to prolong life, Renaissance health manuals and medical textbooks follow the pattern set by Galen's *De Sanitate Tuenda*. Galen's book is concerned primarily with the second of the modes of corruption, that resulting from the flux of substance. Over several hundred pages it explains how to manage the flux through sets of treatments directed toward the preservation of health but organized by the age of the patient. Galen tells how to adjust diet, exercise, sleep, and other so-called "non-naturals" (a term coined after Galen) as an ideal patient with the best imaginable constitution and plenty of leisure to devote to his own care grows older. Over time, the patient's temperament changes in spite of health. His age transforms it. Age serves as an alterable but nearly intractable substratum upon which new forms and standards of health arise. The changes of age are inevitable. Those of health and illness are not.

It would help to understand how Galen, early in the western medical tradition, conceives of old age proper and what effect that conception has on his program of treatment for it. Here, the most important text is *De Marasmo*, a small work about the phenomenon of "wasting."

Μαρασμός , as Galen explains, is a word applied colloquially to all manners of wasting or deterioration whether of the human body or not; for instance, the rotting of fruit. In its proper medical sense, though, μαρασμός refers to "the corruption of the human body due to dryness," as the first sentence of the work states (371). "Corruption" here is again φθορά. The second mode of

[23] It is difficult to tell sometimes if Medieval and Renaissance writers think that prevention or remedy of causes inducing early senescence get at the roots of old age or just alleviate symptoms.

natural corruption identified in *De Sanitate Tuenda* is a kind of μαρασμός. Persons who starve to death experience a kind of simple μαρασμός marked by a disproportionate increase of only the dry quality, but such a case does not make for μαρασμός in the truest sense, for true μαρασμός affects the whole body at once, not just certain parts (371, 381). There are two kinds of true μαρασμός affecting the whole body, each a complicated rather than simple form involving the additional excess of either the hot or the cold quality. Consumptive fevers comprise the excess of both the dry and the hot through the whole body. The latter half of Galen's treatise handles such fevers and their remedies.[24] The kind of μαρασμός distinguished by both the dry and the cold in excess through the whole body is old age.

Both sorts of true μαρασμός affect the whole body at once because they attack the principal members, especially the heart, the ἀρχή of the body, out of which the withering can spread to all other members. According to Galen, when dissecting bodies wasted by starvation, one finds all parts thin and dry except for the principal organs of the liver and the heart, which largely retain their natural composition and moisture (380). By contrast, in the cases of true μαρασμός, even the heart and liver have thinned and dried out. Galen supposes that μαρασμός cannot affect the whole body unless the ἀρχή, or the source of all natural processes, is affected (372). "Real μαρασμός …withers everything at the same rate, because it withers the principles" (381). The heart is the ἀρχή of the body for it is the site of generation of the natural heat and the vital spirits.

Although both kinds of true μαρασμός wither all parts alike, consumptive fever and old age nevertheless differ, and the addition of either hot or cold is not the only thing distinguishing them. True μαρασμός is old age when it occurs ἐν μὲν ταῖς ἡλικίαις ["in the course of nature"] but μαρασμός-like fever when it occurs ἐν δὲ τοῖς παρὰ φύσιν ["against nature"].[25] *De Marasmo* thus begins with an investigation into what it means to say that old age happens by nature, or an

[24] In the nineteenth century, the word μαρασμός was translated as "consumption," the medical term for wasting diseases such as tuberculosis. Historians do not agree on exactly what diseases Galen has in mind here.

[25] Kühn, *Opera Omnia*, vol. 7, 684.

investigation into "what causes old age, for senescence seems to be the kind of marasmus that no one can escape from, as the case appears to be in nature" (373).

The first sense of "natural" that it entertains is contained in these lines. Shortly thereafter, Galen finds this definition in need of solidification. Sometimes people call whatever is inevitable "natural" and reason that old age is natural, for it happens to all living things inevitably. Galen disagrees. In a move surprising to anyone disposed to think Galen an apologist of aging who would defend senescence as a natural necessity, he actually dismantles the common argument that all living things must decline toward death. His explanation relies on the example of an Egyptian philosopher named Philippus, who if not for Galen would remain unknown.[26] Renaissance writers occasionally mention Philippus, but with a disparaging tone and without acknowledging the credence Galen extends to his thinking.[27] Philippus wrote a treatise arguing that with the right kind of regimen, which he propounds, one can enjoy youth eternally. As in the case of Renaissance prolongevist Paracelsus, Philippus's theory suffered from a practical falsification, the demise of its author. Philippus died at the age of eighty, a wrinkled and shrunken specimen of a man (according to Galen). Before he died, his own old age forced him to revise his theory *ad hoc*: still maintaining that eternal youth is possible, he concedes that it is attainable only to those who are born with the right constitution and who take up his regimen of health from infancy.

Galen's surprising response to the case of Philippus is that Philippus was not a fool, as others commonly perceived him, but an intelligent man mislead by facts into an entirely plausible conclusion. For, as Galen continues, "although there is nothing striking or marvelous about the conclusion that everything born will die, it should not be looked on as scientific or necessary, but only as probable" (374). Most people ground the argument that every living thing must grow old and

[26] Galen does not name Philippus here but apparently does in other works. Theoharides lists the occurrences. This account appears in Chap. 2 (373-5). Galen also refers to Philippus in DST, I.12 but does not name him there either.

[27] I have found references to Philippus in John Jones, *Discourse of the Naturall Beginning of All Growing and Living Things* (London, 1574), Fiv r; and Simon Goulart, *The Wise Vieillard* (London, 1621), 22.

die in accumulated experience. So far, every animate thing that has lived long enough has grown old; therefore, any living thing, no matter how well tended, must grow old and die. According to Galen, however, experience alone cannot prove the necessity of the rule. Galen takes an attitude toward experience approaching that of Hume in the eighteenth century; Hume asserts that no amount of it can prove a law of nature. But Galen stops short of asserting the so-called problem of induction. Before venturing into Pyrrhonic skepticism, he enters into a demonstration of why senescence and death are the inevitable fates of living things. Necessary to secure the assertion, he suggests, is knowledge of principles of nature at work beneath appearances.

Senescence is not "natural" simply in the sense that it is inevitable, something that the merely empirical arguments assume. It is also natural in the sense of self-directed process. Generally, for Galen, "nature" is used to comprehend those things exhibiting the principle of motion within themselves, an Aristotelian definition.[28] In organisms, the natural includes the faculties of genesis, growth, and nutrition.[29] Such is nature as process. His demonstration of the naturalness and inevitability of old age depends upon nature understood as such. It unfolds by first refuting a popular conception of old age that purports to explain senescence from natural principles. This conception, or misconception as Galen would have it, is "accepted by almost all the newer philosophers and physicians" (376). After Galen, it persisted through the Middle Ages and into the Renaissance, guiding even newer philosophers and physicians to envisage life and senescence after a fashion that he expressly deplores.

The misconception of old age can be summarized as the metaphor of life as a fire and old age as a dying flame. Building upon the observation that old age is a dry condition, almost all the newer philosophers and physicians compare the body's natural heat to a flame falling on green wood. At first, the dense moisture in the wood, akin to that of human infancy, dampens the flame, but gradually

[28] Aristotle, *Physics*, II.1 (192b)

[29] Galen, *On the Natural Faculties*, trans. A.J. Brock (Cambridge, MA: Harvard UP), I.5 (16-9).

as the flame and the body's natural heat enlarge, the wood and body dry, enabling the flame to achieve its full force and the human body its full vigor. Surpassing their acme, however, the flame and the natural heat recede, lacking the fuel to keep them burning. Once totally deprived of fuel, they die (375-6).

Though popular even among intellectuals, the analogy between life and fire is decidedly "not true" in Galen's opinion. Its error lies in the inability of the properties of fire to explain the front end of human development, growth:

> If I am to judge a comparison of the flames of a fire to the heat of the animals I do not quite understand, namely, how one can compare the destruction of matter by fire with the creation of matter by the internal heat of animals. For what is seen happening in the case of a fire does not happen in growing animals which are instead controlled by their innate heat, which is constantly spreading and carrying powers other than those which are its direct results.
>
> For this innate heat draws food toward it, controls the substance of the body, is able to add to it, to make it regenerate, and to give it a definite form. Altogether, it works in a way which is completely opposite from the one applied by the flames of a fire in treating the substance it is placed upon. What flame would make the wood on which it is placed grow and look like itself? Or what flame would keep the wood from being destroyed the way the innate heat does with our bodies by covering and sheltering the body's particles from water, so that the heat itself would not be lost from them, and forming canals? And of these canals some are able to draw nutrients through them, while others are used for cooling and respiration, and for getting rid of all the waste products. (376)

As suggested by this passage, what Galen desires are natural principles that can connect the various stages of human development along a continuum. The innate heat is undoubtedly important to the alterations experienced by the body as it grows, matures, and declines. But the analogy to common fire fails because fire does not build materials but destroys them and therefore cannot explain growth and metabolism. The innate heat, on the other hand, can add flesh and muscle out of food and even manages to preserve itself by fashioning "canals" that supply it with needed cooling, nutrients, and waste disposal. No earthly fire can control itself as the natural heat does but rapidly burns itself out, which also would be the "direct result" of the innate heat if it lacked the means of its own preservation.

Galen is interested less in the associations between the natural heat and flame than in their disassociations. (In Part Two, we shall see that Francis Bacon's interest runs in a similar direction.)

In other texts, Galen does employ the flame analogy more straightforwardly, but in those instances it carries a tenor different from that which he ascribes to its use by others. In one case, it applies more specifically to the power of attraction exhibited by the various parts of the body, especially those involved in digestion, but the heart as well. The heart, as Galen likes to say, draws blood into itself by an inborn power, as the flame of a lamp draws oil. This does not mean that the *archē* of generation sustains the natural heat that it creates by consuming bodily moisture in the manner of a lamp burning its oil, gradually weakening as it expends its own fuel; rather, it means that the heart possesses a power of attraction and draws blood inside itself dynamically, not mechanically.[30]

Another case, which Peter Niebyl has examined, employs the analogy to illustrate how the innate heat may die in cases of fevers or from the suffocating effects of other extraneous heats, an illustration indebted to Aristotle. The extraneous heat, Galen writes, destroys the innate as a larger flame is seen to destroy a lesser.[31]

Natural heat, nonetheless, bears the responsibility of the body's senescence and eventual death, according to Galen. It dries the natural process that wastes and dries the body; it just goes about it in a manner different from what most people believe and from what the analogy to flame implies.

Galen supplies his own theory of senescence in *De Marasmo*, in a chapter that expands upon passages found in the earlier *De Sanitate Tuenda* and *De Temperamentis*. Essentially, senescence happens for the same reason that growth and maturity do, as a result of the elementary constitution with which an architectonic nature invests the body. Under Galen's paradigm, the natural heat induces senescence not because it burns up bodily moisture the way a flame burns the oil of a lamp but because the quantity of the fire-like element of the body, which is its natural heat, declines in relation to that of dryness and coldness, a necessary consequence of nature's effort to bring each

[30] Galen, *On the Usefulness of the Parts*, trans. Margaret T. May (Ithaca, NY: Cornell, 1968), 316.

[31] Both cases are cited by Peter Niebyl, "Old Age, Fever, and the Lamp Metaphor," *Journal of the History of Medicine* 26 (1971): 353. The second occurs in Galen's *De utilitate respirationis* (Kühn IV.491-2).

organism to perfection.[32] The full development of each organism is nature's ultimate goal, and characteristically it is with this that Galen begins. Nature wishes to establish "the state in which none of the known actions of life is missing."[33] To bring each animal to this state of perfection, the peak of its function, nature requires that the corporeal sources of generation be both soft and hard. First, they must be soft in order to allow for growth and malleability under nature's shaping hand, but later they must turn hard, for the perfect functioning of an animal requires many hard instruments.[34] At this point Galen's reasoning becomes cloudier. For an animal to progress from soft to hard, initially the moist and the dry must dominate its elementary constitution. Although in its body the moist appears in a water-like form, the dry may occur either as earth-like or fire-like. Because the earth-like would overwhelm the moist in the beginning of development when the moist must dominate, the dry takes instead the form of the fire-like, also necessary for the birth and early growth of the animal.[35] Another way of saying this is that to reach its end the animal must begin both moist and hot. From the perspective of material cause, the animal begins moist and hot because the menstrual blood and the sperm, which combine to form the embryo, share those qualities. While in the womb the embryo continually dries, for its natural heat labors to build what nature commands.[36] In fact, Galen suggests that the natural heat may even be nature. By drying, it hardens parts of the body to different degrees, gradually giving them their familiar shapes. The drying process forms blood vessels, the tunics of the organs, nerves, membranes, nails, and bones. Though becoming drier, after birth the young offspring remains profoundly wet.[37] Additionally, the natural heat remains relatively constant from birth to full

[32] DST, 7 and *De Temperamentis* II.2. For translations from the latter I have used Galen, *Selected Works*, trans. P.N. Singer (Oxford: Oxford UP, 1997).

[33] *De Marasmo*, Chap. 4.

[34] Ibid.

[35] Ibid., 377-8; also DST, 6-7.

[36] *De Temperamentis*, II.2, 577-8.

[37] Ibid., 578-9.

maturity—an important point that Galen defends at length using first-hand, empirical evidence.[38] This heat that neither increases nor decreases continues to dry various parts of the body until they attain their full shape and size. At maturity, with their structures realized, all the parts reach their maximum strength as well.[39] But at that point things change. Because of their dryness, the parts of the body eventually cease growing. The natural heat, which originally nature had supplied in a quantity appropriate for growth, now has only the outlets of nutrition and the other vital functions that keep the body active. Overcharged, it continues to dry the parts beyond what is necessary for their best structure and function.[40] Ever drying, the organs and other parts perform their functions less well, and their vitality, or, more literally, "the living thing" within them, becomes more enfeebled and oppressed.[41] Additionally, the body becomes thinner, the skin wrinkled, and the limbs frail. The condition in which all these traits predominate is old age. Old age continues and deepens till "the living thing" within the organs, especially the heart, becomes wholly suffocated and death ensues.[42]

At first, Galen's theory of senescence may seem to differ little from the picture conjured by the flame metaphor. Senescence according to Galen is a kind of drying, and as dryness builds, the moisture of the body correspondingly shrinks, like fire consuming the oil of a lamp—or so one might think. But Galen stresses that the natural heat does not feed on the body and its moisture the same way flame consumes fuel. The manner in which the natural heat dries the body is more incidental. The source of old age takes root in the generation of the animal. Old age happens because nature must make an animal that comes to be over time. The natural necessity of senescence lies in how the body is initially compounded—for growth, not just stasis. Toward that end, the natural heat builds and refines the structures of the body, after which point the heat no longer suits the condition of the

[38] Ibid., 597

[39] DST, 7.

[40] *De Marasmo*, Chap. 4.

[41] DST, 7.

[42] *De Marasmo*, Chaps. 4-5.

body that contains it, accidentally forcing the body toward excessive dryness. If the animal could appear fully formed and perfect, old age would not occur, or, as what might seem more probable, "if it were possible for nature, having brought the animal or plant to the prime of its life, to induce another elementary constitution which would be as powerful as the first one," the animal could remain young forever.[43] Or, at least, it would remain eternally young if one could exercise perfect vigilance in monitoring its nutrition, for the second mode of corruption, the flux of substance, still could destroy it. The problem of perfectly nourishing it is moot, though, because "it is not possible to move and change the first elements of the growth of animals and plants." Thus, it is "inevitable that the body will continue drying up even after maturity."[44]

Galen's theory of senescence exhibits several features worth noting for their influence upon theories of the Middle Ages and the Renaissance. The influence is by no means a straightforward replication. Foremost is its aversion to the flame-life or flame-natural heat metaphor. The metaphor became one of the favorite *topoi* of later medical writers, who explained senescence through the concept of radical moisture. The radical moisture theory, to be discussed in relation to Avicenna, characterized life, or the natural heat, as a flame consuming the oily moisture holding the body together. When Avicenna deploys the lamp metaphor to illustrate aging, the image confuses the transition between maturity and old age. Galen, however, insists that the flame metaphor makes no sense in the case of living things and that the natural heat does not consume bodies the way the analogy suggests. Instead of positing natural heat as an earthly flame, he re-affirms Aristotle's doctrine that the natural heat, as a principle of nature introduced through the spirituous semen, differs substantially from earthly fire. It is for Galen and Aristotle akin to nature itself, the great craftsman.

A qualitative difference between natural heat and flame explains only in part why the flame metaphor makes no sense. Explicitly, Galen's dismissal of the metaphor rests on the evidence

[43] *De Marasmo*, 377-8.

[44] Ibid., 378.

suggesting their substantial dissimilarity: senescence is continuous with the earlier process of growth. Galen believes that a viable theory of senescence must be able to fit the whole nature of the creature, which is the site of a long, uninterrupted process of coming-to-be and passing away. The radical moisture theory requires much finessing to do that.

Thirdly, although in Galen's view old age marks a decline in the power of the bodily faculties, it has a material cause. The weakness of the faculties defines old age because their full power marks the acme of the creature's development. Old age thus begins after the prime of life. In old age, however, the body's condition is also cold and dry. Its dryness induces the degradation of its powers. As a material condition, too, then, old age stands at the opposite pole from infancy and youth, which are not only vigorous but also hot and moist. The third condition occurring between youth and age, maturity, or the acme of structure and strength, "consists in the medial state between the two extremes, which is neither excessively dry, as is old age, nor replete with moisture and fluids in the manner of the newborn."[45]

Galen's take on senescence as cold and dry, which he probably derives via Aristotle's *Parva Naturalia*, contradicts another tradition descending from the Hippocratic corpus which held that old age was instead cold and wet, as sensory evidence would seem to indicate. Old men, it was noticed, produce much excrement from their eyes, mouths, noses, stomachs, and lungs, which would seem to signify an excessively wet temperament. This "Hippocratic" view enjoyed great currency through the Middle Ages, because the popular Arabic textbook *Isagoge* by Joannitus (809-77 C.E.) defines the fourth stage of life, decay, as "cold and moist, with the appearance of the phlegmatic humor."[46] In the Renaissance, physicians and philosophers champion Galen's view in near unison.[47] Their

[45] *De Temperamentis,* II.2, 580.

[46] In *A Source Book in Medieval Science*, ed. Edward Grant (Cambridge, MA: Harvard University Press, 1974), 707. For the original Hippocratic opinion, see *Hippocrates*, vol. 4, trans. W.H.S. Jones, (Cambridge, MA: Harvard University Press, 1943), 2-13.

[47] Some examples are Jean Fernel, *Physiologia,* trans. John Forrester (Philadelphia: American Philosophical Society, 2003), 253-4; Andreas du Laurentius, *A Discourse of the Preservation of the Sight* (London, 1599), 174; Levinus Lemnius, *Touchstone*, 70v; and Leonard Lessius, *Hygiasticon* (Cambridge, 1634), 150.

confutations of the Hippocratic theory generally replicate that given by Galen himself. Galen's counter-argument evokes a feature of physiology that gains even greater importance with the development of the radical moisture theory, the "spermatic" or "solid and similar" parts.

The counter-argument made in Galen's *De Temperamentis* acknowledges the increase of excrements but holds to the essential dryness of the senescent condition all the same.[48] What really matters is that the body dries unequally. After maturity, while the natural heat continues to dry the parts, those parts that already have been made dry for the sake of the body's good functioning, lose more of their own heat and consequently their power to assimilate. The nutritive moisture that goes unabsorbed builds excrements on the outside of each part while the inside of each part becomes dry and undernourished. Old men are thus dry in the solid parts of the body, that is, actually dry, but wet in excretions, or accidentally wet, the converse of the condition of infants. (The bodies of animals are really their solid parts.) Once again, this drying process connects back to the generation of the animal, for the solid parts of the body—"bone, ligament, membrane, artery, vein, nerve, casing, and flesh"—are spermatic parts, meaning that they arise in the embryo from the drying effect of the sperm's heat on the spermatic moisture.[49] As designed by nature, the spermatic parts resist nutrition on account of their dryness, especially in old age, whereas the other parts of the body can be nourished or restored fairly easily even in old age. The notion of disparity in the rates of drying and repair between certain sets of parts underwrites theories of senescence in the Middle Ages and Renaissance. By most accounts, such as those by Avicenna and Jean Fernel, discussed in the next chapter, the radical moisture resides in the spermatic parts.

Although Galen does not speak of radical moisture *per se*, he provides the fundament upon which the idea would develop. The dryness proper to old age, that is, the first kind of φθορά, occurs at a disproportionate rate in the different kinds of parts, and the hardest to re-moisten are the solid and

[48] *De Temperamentis*, II.2, 580-2.

[49] *De Temperamentis*, II.2, 581. Also see *Ars Medica*, Chap. 26, 378.

similar or the spermatic parts. It is these parts, the first to develop and those giving forms to the rest, that seem to control most the rate of senescence. Whether someone can do anything to slow or reverse senescence, according to Galen, is another question. Galen's answer depends upon more than a practical difficulty. It also entails a theoretical stance toward old age in relation to disease and health.

As historians of medicine tell us, the learned physicians of the Renaissance divided the practical part of their science into two branches, therapeutics for the cure of disease and hygiene for the preservation of health.[50] The division accords more or less with Galen's *De Sanitate Tuenda* and *To Thrasyboulos*, which discuss the offices and objects of medicine.[51] Yet in the highly influential *Ars Medica*, or the *Tegni* as it was known in medieval Latin translations, Galen includes a third branch, too, which finds its way into some early modern schemas. The *Ars Medica* defines medicine as "the knowledge of what is healthy, what is morbid, and what is neither."[52] Hygiene treats the healthy body; therapeutics, the morbid body; and the third branch, the body that is neither. This "neither" state, Galen says, can be understood a number of ways, but what matters most to the practicing physician are bodies on their way to becoming diseased or on their way to becoming healthy. In the first case, the "neither" branch is the prophylactic art; in the second, case, it is the analeptic, or recuperative, art. The prophylactic art guards patients who show signs of oncoming disease from slipping further into morbidity while the analeptic assists patients who are recuperating from a disease to maintain their health without slipping back into morbidity. The analeptic, however, presides over more than just patients recovering from intermittent illness. It also treats those who are old. In the *Ars Medica* Galen twice draws the comparison between patients who are recovering from

[50] Most commonly, Renaissance physicians seem to have divided their art as a whole five ways: physiology, pathology, semeiology, hygiene or dietetics, and therapeutics. For a discussion of the different schemes available to medieval and Renaissance writers, see Heikki Mikkeli, *Hygiene in the Early Modern Medical Tradition* (Helsinki: Academia Scientarium Fennica, 1999), 32-40.

[51] DST, 5 and *To Thrasyboulos*, Chap. 31, 865-6 and Chap. 39, 882. Translations of *To Thrasyboulos* and *Ars Medica* are by Singer.

[52] Chap. 1, 307.

disease and patients who are elderly.[53] He also reinforces the point in *De Sanitate Tuenda*, his work that contains his most replete discussion of geriatrics (201). The treatment of the old resembles convalescence, or analepsy, because, like patients recovering from disease, elderly patients are neither healthy nor morbid. Yet their condition leans more toward health than toward disease. Therefore it is not the proper object of the prophylactic art but of the analeptic; it requires measures more preservative than curative.[54]

Galen's own categories are not wholly consistent. In *To Thrasyboulos*, the recuperative and prophylactic arts fit beneath the preservative art, hygiene, not alongside it, but when measured by the restorations required to effect them, they still fall between hygiene and therapy.[55] In the Middle Ages and Renaissance, medical writers did not always maintain consistent categories either; nevertheless, the influence of Galen among them is clear. When discussing old age, they often refer to its treatment as analeptic and compare it with convalescence from disease. During the Renaissance at least, this must have been due in part to the popularity of *De Sanitate Tuenda*, one of the most widely printed of Galen's texts and the common basis of the proliferating health manuals.[56]

From the theoretical organization of the medical art, it would appear that Galen and Galenic medical writers following him would have a simple answer to the question whether old age is a disease. It is neither. But the answer is not as simple as it might first appear. As Galen notes in the *Ars Medica*, one may understand "neither" a few different ways (Chap. 2, 311-313). Old age is neither health nor disease in the sense that all of its signs should be construed as indicating a state falling between the healthy and the morbid, not in the sense that some of its signs indicate the healthy and some the morbid (Chap. 21, 358-9). Thus it fits Galen's first definition of "neither," which he applies to cases participating in neither extreme of health and disease. Such cases occur either

[53] Chap. 21, 359 and Chap. 37, 405.

[54] *Ars Medica*, Chap. 36, 403-7.

[55] Chap. 30, 862-4.

[56] See, for example, Thomas Newton, *The Olde Man's Dietary* (London, 1586), B2 r.

generally from birth or temporarily at some later date. Old age would seem to fit the general model, except that it is not a condition occurring from birth. Once it does occur, however, it is a condition affecting the patient, as "neither" conditions generally do, "always" or "for the most part," the Aristotelian standards for what occurs by nature. In *De Sanitate Tuenda*, Galen refers to it as a "disposition" [σχέσις]. Analepsy and gerontology, he says, treat conditions that "seem to be not in accordance with the most perfect health, but midway between health and disease, or not wholly of that which is in accordance with habit [ἕξις], but rather that which in accordance with so-called disposition" (201). Perhaps Galen intends something like Aristotle's distinction between "habit" [ἔθος] and "character" [ἦθος]. A disposition exceeds mere habit by its engrained stability. Disposition builds upon habits in conjunction with nature; character is a disposition of the soul. Like character, old age is a settling but, unlike character, a settling of the body, not of the soul. It is a relatively fixed state of the body, fixed relative to the transience of common diseases, the temporality of which it might affect, but also similar enough to disease to raise the question whether old age remains a condition of health or is a form of disease.

In *De Sanitate Tuenda*, Galen shows little concern for scrutinizing the question whether or not old age is disease (201). But *De Sanitate Tuenda* is a practical manual. *To Thrasyboulos*, on the other hand, is a highly theoretical work exploring the question whether hygiene properly belongs to the art of medicine or the art of gymnastics. Along the way it supplies necessary texture for the previous question and therefore may help understand how Galen and medical writers who later adapted his ideas may have conceived of the relationship between health and youth, disease and old age. It does this rather indirectly, because its main concern soon becomes trying to figure out the right relationship between the strength of the body when that phrase is understood in its widest sense and health. The reason for the tighter focus is that gymnastics was generally considered to oversee bodily strength as medicine was generally considered to oversee health.

In *To Thrasybolous* Galen makes a surprising claim. The greatest good of the body is not, he says, health. Health is the "natural constitution of the body" [τῆς κατὰ φύσιν τοῦ σώματος

κατασκευῆς], which comprises a balance of the qualities hot, cold, dry, and wet, along with the right size, proportion, and arrangement of the parts (830, 859).[57] We might assume that Galen took health to be the greatest good of the body since physicians of the medieval and early modern eras direct all their efforts toward obtaining that best constitution of the body, especially the best temperament of qualities and humors. Instead, Galen writes: "The fundamental, first good of the body, that which we most need, is perfection of the functions (which is often referred to incompletely as 'power' or 'strength'—one should not use those terms on their own, but rather say 'power of the functions' or 'strength of the functions')" (832). By "functions" [ἐνεργείαι], Galen refers to the nutritive, genetic, sensitive, and intellective functions, or at least to whatever of those functions the body contributes:

> Strength has the same relationship to functioning as good condition has to health. They come about at the same time, and strength, like good condition is of something: good condition may be considered an excellence of the natural constitution, or if you prefer, state, of the body, while strength would be excellence of functioning. (830-1)

Strength of functioning and health are distinct. The strength or power [ῥώμη, ἰσκύς] of the functions is the highest good of the body, for the body exists for the sake of the soul; we want the body to operate as well as it can in order to support the soul fully, enabling us to choose and perform those actions that distinguish human beings as moral creatures. Galen still recognizes health as a good, just not as the highest good. It is a secondary good. Its subordination, however, relates only to its worth. It has instrumental value, not intrinsic. It is "not a good in the fundamental sense, not being a good in itself, but by virtue of the fact that the first good (the good in itself) is completely dependent on it for its production" (832). What one most needs is strength of functioning, not natural constitution, but to achieve strength of functioning, first one must secure the natural constitution of the body. Though not prior in worth, health is prior as cause to effect. Health gains priority over strength of functioning whenever one needs to maintain or restore the sound functioning of the body,

[57] In citing *To Thrasyboulos*, I use the page numbers in Kühn, *Opera Omnia*, vol. 5. Singer includes these in the margins of his translation.

for good condition of the body produces strong functions—as it also produces the third good of the body, beauty. The art of medicine, Galen writes,

> brings about health, while functioning and natural beauty follow as natural consequences of that…In producing this [the physician] has no further concern with functioning or beauty—these would follow of necessity, even if the practitioner did not want them to. Once he has produced health, he is powerless to prevent these other phenomena; it is, however, in his power to prevent health itself. If, on the other hand, health is in some way destroyed, he cannot bring about natural functioning or beauty in the body. (833-4)

Medicine takes health as its purposed aim; good functioning and beauty are incidental to it.

When speaking precisely, Galen keeps health and strength of functioning separate. His definitions, however, cannot sever the deep connections between the two, and in fact, when he has the practical aims of medicine in mind, he stresses their connections. He insists that both must exist together: "It is thus impossible for one to precede the other; both must be present if one is" (830). If a body possesses health, it automatically will have strength of function; and if it exhibits strength of function, it must have health. The reason is that strength of function depends exclusively on good health as its cause, and good health cannot exist without strength of function (and beauty) emerging. The synchrony of all the goods of the body, beauty included, also unifies the arts of the body under one heading in accordance with the processes of nature:

> All these things [strength of function, health, and beauty] grow and decrease, reach their perfection or destruction, simultaneously; what harms or benefits any one of them automatically also harms or benefits all the others. It is obvious for this reason too that there must be only one art which regards them all. (831)

If not for the necessary concomitance of the three, one could divide the art governing the human body into three distinct arts, if not more, one for each possible good—a procedure Galen repeatedly rejects in *To Thrasyboulos* (819-828). But, because all the goods of the body rise and fall in agreement with one another, the art overseeing the human body remains single. It possesses one overarching aim, the perfection of the human body, to which each good contributes; however, practitioners of the art, following nature, can perfect the body solely by preserving and restoring health, its natural constitution. Whatever practitioners do to improve or injure health has the like effect on strength of function and beauty, increasing or decreasing them in kind, but incidentally.

As it continues, Galen's analysis fuses health and strength of function more tightly still. Although he would have health and functioning be two different states for which good condition is the excellence of health and strength the excellence of functioning, he also measures health in terms of functioning. By this wider construction, health equals functioning. Its quality admits four or five grades corresponding to the level of function. The convalescent patient serves as Galen's explanatory key. The convalescent patient exhibits the next-to-lowest grade, health "in state" [κατὰ σχέσιν]. The lowest is illness, marked by "an inability to perform the activities of life." With health in state, functioning does not decline to the level of impairment that occurs in illness; nevertheless, "the weakness is such to make the performance poor" (816). Furthermore, with health in state, one remains susceptible to impairment. The convalescent patient

> is so feeble and lacking in strength for bodily functions that he requires help to move. Such a person needs no cure, as he is no longer ill; but he does need building up and strengthening to be able again to perform his natural activities and have a resistance to external influences. Obviously a person in this state immediately subsequent to the removal of the illness will not have the strength to endure heat or cold, or deprivation of sleep or drink. He would very easily fall ill again, as his state of health is not yet secure or firm. (814-815).

Above health in state lies health "in condition" [καθ' ἕξιν] when the patient can perform all the activities of life without hindrance and is not susceptible to impairment but lacks full vigor all the same. The first truly praiseworthy state is health "in good condition" [τῆς εὐεξίας], firmly secure against impairment and enjoying full strength of function. The fifth grade, the peak of good health, represents the peak of functioning but may be an ideal condition rarely if ever found, perhaps the condition studied through most of *De Sanitate Tuenda*.

In sum, health in its wider sense varies according to strength of function. In illness, function is severely impaired; in the convalescent state it is weak; in condition, it is neither weak nor strong; and in good condition, it is strong.

The relationship between strength of function and health has direct bearing on senescence. When we consider that in Galen's analysis the recuperative state corresponds to old age, we can see that old age consists of a weakness of functional power. However, when we also take into account

Galen's idea that good functioning depends upon good health for its emergence and that in the more precise sense health amounts to the proper, natural constitution of the body, then for functioning to falter, the health and constitution of the body must deteriorate first.

As reflexive concepts, health and disease admit of greater latitude, for only with a great deal of roughness can either restrict all the changes that the human body experiences. For each person, health changes with age, just as it differs between people, not all of whom see, hear, run, or throw with the same strength. In later eras, age was ranked among several "concomitants" circumscribing health, including climate, customs, and gender. According to a most basic definition given by Galen, health is "the condition in which we do not suffer pain, and are not impeded in the activities of life" (DST 15). At the peak of health, the body possesses the balance in all its parts conducive to their "unimpaired capacity of function" (DST 15). The full power of bodily functions represents the best form of health for each person no matter his innate constitution. But it also represents the *acme* of his development.

Defining health according to strength of function, one would seem to be forced to recognize old age, marked by the diminution of that power, as a disease. Galen, however, reasons differently. One does not judge a decline in functional power as disease unless it occurs apart from the necessary course of nature: "Strictly speaking, weakness of function is not a sign of disease; only what is contrary to nature is a sign of disease" (DST 15). We do not determine the strength or weakness of our own vision and hearing by the abilities of an eagle or a lynx or the strength of our limbs by the achievements of Milo the gymnast (DST 15-6). Instead, Galen implies, we presume natural limits to the strength of our functions, limits set upon the human race and upon each person. Those who fail to reach the heights of function attainable for others are not considered diseased, because "such people are not contrary to nature, any more than the aged" (DST 16). Galen concludes,

> One ought not, therefore, to determine health and disease merely by vigor or weakness of function, but one should apply to the healthy the term "in accordance with nature," and to the sick the term "contrary to nature;" since health is a condition producing function in accordance with nature, and disease a condition producing function contrary to nature. (DST 16)

Thus, viewed over the whole course of life, the condition of old age may resemble disease, for it demonstrates a fading of the body's faculties; however, the strength of the body's faculties also constitutes benchmarks for each phase of life, especially the three of growth, stasis, and decay. When viewed this way, as a transient norm, old age is not a disease.

In sum, old age causes a "deviation from perfection" rather than disease, but unlike the other two causes of imperfection listed by Galen—poor development at conception and accidents—old age necessarily affects all persons who live long enough (DST 195). After the prime of life, the functions weaken on account of the dryness that causes the natural heat, which stimulates the functions, to lose its efficacy of conduction. The fading of the natural heat then results in the general coldness of old age. The progressive weakening of the functions nearly corresponds to a traditional three-part division of old age, a schema deployed frequently by writers after Galen, too. In "pre-senility" or green old age, one is still whole enough to discharge even the duties of civic life. In the medial state of old age, one no longer is; however, enough digestive strength remains to tolerate regular baths and other treatments of the geriatric part of medicine. In the final phase, one cannot even tolerate baths frequently without ill results, and the digestive faculty tapers to near surcease (DST 230-231).

In spite of certain imperfections, Galen insists that at least through the first two phases old age keeps a state of health appropriate to it. The last stage he discounts as a threshold of death, not a part of life. He seems not to recognize it as a necessary stage of senescence (DST 231). The stages of senescence that he does acknowledge are healthful:

> Now all men begin to decline in strength after the age of prime, but they do not lose their health. They have less admirable health than before, but nevertheless they have it not only until the beginning of old age, but also throughout old age itself which seems to some to be a physical disease, when they neither suffer, nor lose completely any of the faculties which we employ in the affairs of life, nor become completely enfeebled, but enjoy the health which is appropriate to age. (DST 239)

The health of old age has few criteria. A healthy old man "can see and hear and walk, and do other things, and his body does not fail him" (DST 239). Health persists as long as one does not suffer pain or as long as no function completely stops, neither of which condition arises from senescence itself.

The distinction of old age as an inevitable process would seem to suggest as a consequence that medicine can treat the elderly to the end of preserving and restoring their health but not to the end of redressing senescence. This is not quite the case. Galen assigns two functions to the geriatric part of medicine. One function he elaborates in *De Sanitate Tuenda*, and this is the hygienic program aimed at preventing "accidental" old age. The other he elaborates in *De Marasmo*, and this addresses senescence proper as a kind of marasmic drying. Although Galen divides them in theory, the difficulty of the latter prompts Galen to fall back on the first.

In *De Sanitate Tuenda*, the means of prolonging life is the lifelong practice of hygiene. By sustaining the best possible balance of qualities in all the parts, one prevents the second mode of corruption, that of flux of substance, from destroying the body sooner than need be. If one did not replenish solids, liquids, and air, the body would break down and die very quickly. However, by employing an improper regime of food and drink and the other non-naturals, one may induce diseases in the body, some of which, like a marasmic fever or deep sorrow, can mimic the effects of senescence and bring on early old age. Hygiene serves to prolong life by keeping the replenishment that one uses against the second mode of corruption from doing more harm than good. It prolongs life by saving the body from conditions that might kill it quickly or accelerate the process of senescence. "It is likely," Galen professes, "that those who do not know the hygienic regime will die sooner than in the course of nature" (DST 235). Hygiene enables a patient to fill out the natural span of life by deflecting diseases that would foreshorten it.

For hygiene to prolong life, however, it must be practiced throughout life, and its geriatric part represents only one of several. Geriatric hygiene adjusts the usual sort of treatments to the conditions peculiar to old age, just as hygiene does for the conditions peculiar to the first seven years of life, to the second seven, and to maturity. The big difference, though, is that it treats old age as a disease. As well known, Galen prescribes similar remedies for bodies in health but contrary remedies for bodies in sickness. But Galen insists that old age, being a cold and dry condition of the body, requires treatments by opposites. The main objective of geriatric hygiene is to warm and moisten, or

to counteract the natural disposition of the body (DST 195). In other words, it is to treat old age by means of its opposite condition, the way one treats disease.

Galen's geriatrics resembles general therapeutics. Yet a difference separates the two. Therapy requires a strenuous and temporary application of opposites; geriatric hygiene, a moderate and regular application of them. Of greatest use to geriatric hygiene are moist and warm foods and drinks (particularly noteworthy for the subsequent history of medicine are milk, honey, and a tawny-colored wine moderately aged);[58] food in small quantities to preserve the power of digestion; light, moderate exercise, especially massage, which supposedly aids the parts in their assimilation of nutrients;[59] baths to moisten the body; emetics to expel extraneous humors;[60] and frequent, short periods of rest, usually after meals. The gentleness of geriatric hygiene amounts to applying opposites gradually, not all at once; soothing the best functions without trying overly hard to fix the weakest; keeping up ordinary activities without enforcing new exercises; and avoiding the cure of pathological conditions that might overlay senescence. Geriatrics also has a therapeutic part, but in elderly cases, hygiene and therapy look much alike. In fact, Galen's prevailing recommendation for geriatric therapy is to moderate it to such an extent that it resembles hygiene (DST 220).

Of course, his prescriptions for geriatric cases amount to analepsy. Galen refers to the condition of the old body as neutral, mid-way between the conditions of the healthy and the diseased bodies, and the treatment of neutral bodies, he affirms, must resemble that of convalescence, when the physician attempts to strengthen a body recovering from a transient illness by securing the balance of qualities. According to the *Ars Medica*, the convalescent case, like the senescent case, exhibits a depletion of strength in the faculties and of vital breath, or *pneuma*. Analepsy, its treatment,

[58] DST, 204.

[59] DST, 196.

[60] DST, 216.

delicately applies opposite qualities in order to restore basic health and good functioning. The point of analepsy is not so much to expel disease as to build and sustain strength.

In *De Marasmo,* the method of prolonging life is to meet head-on the first mode of corruption, senescence itself. After defining old age as a maramsus differing from true marasmus only in two regards—in quantity (not essence) and in its natural necessity—Galen states, "It is impossible then to prevent the marasmus of old age, but it is possible to help extend the length of life." This means, however, that one can extend the length of life by means other than preventing and fixing imbalances that might induce an early old age; one can counter the normal process of senescence as it withers even the healthiest of constitutions. The way to prevent aging as much as possible is to moisten two of the principal members, the heart and the liver, but especially the heart. Because life ends when the heart dries so much as to stop working, "as long as the heart stays in motion with its own energy, there is no way that the animal can die" (379). But just as soon as Galen raises the possibility he undermines it. He doubts the ability of medicine to moisten the heart enough to prevent the loss of its own energy through drying:

> If then it were somehow possible to moisten the substance of the heart, or even that of the liver, this would allow the prevention of aging. If, however, no one is able to moisten either the liver or the heart any more than they are normally moistened, and if it is inevitable that not only their viscera become drier in the course of time, but their arteries and veins as well, then it is impossible to prevent aging but it is possible to slow the process down. (380)

Galen extends the contingencies upon which the prevention of senescence depends: what at first is true of the heart radiates to the liver and then to the blood vessels; all must be kept from drying. Nature, furthermore, enforces the desiccation all of those parts over time. Old age withers "the solid parts, which we call both primary and homogeneous," which constitute the tunicles of the organs and the walls of blood vessels. The worst degree of marasmus desiccates the solid parts.[61] Like any marasmus that wastes the solid parts, old age is also "incurable" (383). Thus, even well-constituted

[61] The lesser, more treatable degree wastes the nutrients of the solid parts but not the solid parts themselves—an important distinction in the later development of radical moisture theory.

persons who practice good hygiene grow old. Medicine can slow senescence perhaps, but certainly it cannot stop it.

The therapies it supplies to this end, though, look identical to the articles of hygiene mentioned in *De Sanitate Tuenda*. Galen defers to a prescient passage in Homer to illustrate the instruments that medicine can deploy against the process of old age: "one should eat after he has bathed, and he should eat plenty of soft food as is proper for old people" (380). As subsequent pages explain, the treatments against senescence do not begin until old age does—after the prime of life, when the solid parts are already becoming cold and dry. The moistening of a cold and dry body requires the same measures as geriatric hygiene. To slow senescence, elderly patients must soak in warm baths and eat soft and moistening foods, such as milk, wine, and honey—the same things they must do to maintain their health (380, 389).

As *De Marasmo* continues, the baths used for marasmic cases become increasingly important. They are the closest thing to a treatment targeting senescence. These baths work by assisting the nourishment of the parts. As Galen explains, food does not travel to the parts in a haphazard, mechanical fashion; rather, the parts attract food to themselves (380). After the prime of life, the parts lose their innate power of attraction as they dry; the liver and the heart, with the strongest attractive power, last of all, which is why natural death comes with the failure of the heart. Baths help the parts to assimilate the food by moistening them. Softened parts can absorb food more easily. Thus, baths help the nutriment penetrate more deeply than it can on its own. The technique is imprecise and difficult, though. When baths moisten the areas around the liver and the heart, Galen says, "sometimes these organs are moistened as well" (380). The word "sometimes" [πότε] recapitulates the difficulty of the task. The types of foods used also matter. To nourish dried parts, they need to be "thick and sticky," for then they evaporate more slowly and are easily assimilated by the parts (388). However, foods consisting of warm particles also serve (388). Hence, the efficacy of milk, wine, and honey.

It is hard to tell how strongly Galen recommends such baths as treatments for senescence, for his discussion at this point in the text centers on febrile marasmus and other sorts of acute consumption. By analogy, though, he might consider them applicable. Their introduction is important, for some Renaissance physicians may have thought the kind of deep-moistening treatments used for consumptive cases also might tackle senescence directly. Laurent Joubert, at any rate, makes this claim in *Popular Errors*. In fact, he uses the example of deep-moisture baths to demonstrate that medicine can truly prolong life—that is, can raise the term of life beyond what an individual's innate temperament would dictate—rather than merely prolong it by sparing a patient from lethal disease.[62] Most works of geriatric hygiene, though, tend not to transfer into practice the theoretical distinction between the φθορά of old age and the φθορά of flux, as Galen does not. Furthermore, another cure for consumptive cases acknowledged as a treatment against senescence is usually represented as unorthodox. This is the Chaldean cure, similar to and perhaps used in conjunction with deep-moistening treatments; I discuss it in the next chapter in relation to Marsilio Ficino.[63]

Although in *De Marasmo* Galen turns away from age-accelerating disease and toward normal senescence, he struggles to translate that theoretical distinction into practice. His struggle is understandable; no one else has figured out certain and acknowledged ways to treat senescence, either. However, in Galen's case, a veneration of nature and an assumption that old age cannot be avoided have something to do with the confusion as well—and this despite a possible gesture toward an inductive and experimentally adjustable theory of aging. The aim of gerontology is, Galen says, "to clarify the nature of the problem of aging, and to resist aging and prevent it as much as possible." Galen, though, seems little concerned with trying to remedy senescence itself, for rational principles already have determined how much prevention is possible.

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[62] Laurent Joubert, *Popular Errors*, trans. Gregory de Rocher (Tuscaloosa: University of Alabama Press, 1989), 42.

[63] A replete analysis of how Renaissance physicians approach the treatment of senescence, and specifically whether or not they think they possess means of altering the process, requires closer and broader examination of what medical texts of the era have to say about marasmic cases. This is crucial; however, I have not done it yet.

Additionally, he does not urge readers to combat senescence their whole life long. Although he stresses the continuity between growth and decay, he appears to believe that the damage symptomatic in old age does not accrue all through life but only after one's prime. Only then does the body begin to dry. Thus, treating senescence becomes a matter for geriatrics, and for most medieval and Renaissance physicians it stays a matter for geriatrics.

Section (c): Avicenna

For Galen, the treatment of senescence proceeds through the maintenance of health. Functionally, geriatric hygiene and the therapy of senescence are the same, and they remained the same well after Galen. In subsequent centuries, the largest change to classical medicine's theory of senescence was the introduction of the concept of radical moisture. The idea of radical moisture retained Galen's theoretical division between health and aging, but it tended to accentuate the difficulty of remedying senescence directly, as we can see in the *Liber Canonis*, a standard textbook of medicine from the Middle Ages through the Renaissance.

According to Thomas Hall, the radical moisture theory developed with later Arabic medical writers, most importantly Avicenna, based upon precedents in Galenic and even pre-Galenic medicine. Following Hippocrates, Galen postulated three types of moistures within the body, each from a different stage of digestion, the first in the blood, the second in the spaces between the tissues, and the third within the tissues themselves. In addition, Galen referred to a moisture resident and proper to each of the parts, which he had called an innate and connatural moisture but associated with the second kind of Hippocratic moisture, that between the tissues.[64]

These three kinds of moistures Avicenna then grouped under the heading "secondary humidities," distinguishing them from the primary humidities of blood, phlegm, yellow and black

[64] Thomas Hall, "Life, Death and the Radical Moisture," *Clio Medica* 6 (1971): 7.

bile, the four humors so prominent in later medicine (75; I.4.1.1).[65] According to Avicenna, the nutriment in the blood is only potentially nutritive till presented to the tissues, at which point, after the second digestion, it becomes a moisture that saturates "like dew" [*sicut ros*] the tissues and is quasi-nutritive (not yet nutriment but capable of becoming so, if need be). Only with the third digestion does the food taken into the body become fully nutritive, as it is assimilated into and replenishes the tissues, or the solid parts. Unlike Galen, however, Avicenna proposes one more step to the digestive process. While part of the third moisture becomes solid tissues, another part is converted into a moisture that "accounts for the continuous identity of the member or organ or of the body throughout one's life." Radical moisture is the fourth humidity, the product of the third digestion (75).[66] By later writers, it is also called innate, natural, substantial, or primigenial moisture. It differs from primary and secondary moistures by being in-born rather than adventitious. Deriving from semen, it emerges with the coming-to-be of the creature and is responsible for maintaining the continuity of the solid parts, or tissues, even as they lose bits of themselves through use, disease, and age (75).

Generally, the physiology presented in the *Liber Canonis* differs from Galen's in its much heavier emphasis on humors. The balance of qualities that determines health or disease comes about through the balance of humors—phlegm, yellow and black bile, and blood—in the parts.

The addition of the radical humor affects the dynamics of growth and decay. Although Avicenna uses Galen's concept of two pathways toward natural death, which he refers to as "the two internal sources of injury," he changes them in significant ways. The first pathway sounds enough like Galen's, the drying process that marks senescence proper: it is "the dissipation of the moisture

[65] For English translations, I have used *The Canon of Medicine*, adapted by Laleh Bakhtiar (Chicago: Kazi, 1999). Bakhtiar mostly reprints the earlier translation by O. Cameron Gruner and retains his section numbers. For the Latin, I have consulted the 1507 translation reprinted by Georg Olms Verlagsbuchhandlung (Hildesheim, 1964). In the parentheses, the numbers before the semicolon identify section numbers, while the numbers after the semicolon state book, fen, doctrine, and chapter.

[66] Or of the fourth digestion if one starts counting from the conversion of food into chyle, which occurs in the stomach.

from which we are created," a dissipation that progresses "in an orderly manner" (1421; I.3.1.1). The second pathway, however, is not the outpouring of substance that kills us if not remedied by the introduction of new substance but "the putrefactive breakdown and metamorphosis of the humor into a form such that the fermentative phenomena of life are no longer able to proceed" (1421). Over time, this "humor" not only drops in quantity, it also degrades in quality. Both internal sources of injury, the diminution and the corruption of the humor, make up senescence.

A number of factors, internal and external, contribute to each source. The external factor is the atmospheric air, which can both dissolve and putrefy. The internal factors are the "innate heat" [*calor innatus*], which requires moisture as its fuel in order to keep the members functioning, and "extraneous heats [*calores extranei*] generated within us from the aliments, and through other agents which cause putrefactive changes in our moistures" (1425). All factors, external and internal, cooperate to dry the body over time. Eventually, the moisture from which we are created falls to both a quantity and a quality low enough that the members lose their strength and finally their capacity for life (1426).

These internal and external factors have trouble cohering with Avicenna's primary didactic tool for explaining growth and senescence, the lamp metaphor. As Peter Niebyl and Michael McVaugh have shown, Avicenna departs from Galen by using the lamp metaphor as device to explain senescence.[67] Aristotle and Galen compared vital heat with the flame of a lamp when discussing the dangerous heats introduced by fevers or other external sources. In their uses of the analogy, the action of the lamp illustrates the point that an exorbitant heat in the body can extinguish the innate heat by suffocating it with its more powerful flame. For Aristotle and Galen, the elemental fire in the body comes from pollutions, not from the innate heat, for neither author considers the innate heat elemental.

[67] Peter Niebyl, "Old Age, Fever, and the Lamp Metaphor," *Journal of the History of Medicine and Allied Sciences* 26 (1971): 354-9 and Michael McVaugh, "The 'Humidum Radicale' in Thirteenth-Century Medicine," *Traditio* 30 (1974): 263-8.

In a later passage, Avicenna deploys the metaphor similarly when discussing fevers. Synthesizing Galen's explication of fevers and recent medical tradition, he writes that fevers have three grades, one consuming the moisture that bedews the tissues (easily curable), a second consuming the glutinous moisture assimilated into the tissues (curable with strenuous effort and the help of God), and a third consuming the radical moisture (incurable). In the first case, the fever matches a flame consuming the oil poured into the basin of a lamp; in the second case, it matches a flame consuming the oil in the wick; and in the third, or hectic, case, it matches a flame burning the wick itself and its "radical humidities" [*humiditates radicales*].[68]

Avicenna differs from Aristotle and Galen, however, when he applies the analogy to the phenomena of growth and natural decay, to the whole course of life: "The innate moisture is to the innate heat as the oil of a lamp is to the flame" (1429; I.3.1.1). From conception to infancy, we consist of much more moisture than heat, and the moisture would suffocate our flame if the latter did not "continue to exert its own effect, that is,…desiccation" (1427). Like Galen, Avicenna recognizes that our body requires a certain amount of dryness for its "perfection" [*perfectio*] and "soundness" [*integritas*] and for the "power [*potentia*]" necessary to perform its functions (1426). To that end, the natural heat, which remains constant for roughly the first half of life, dries the moisture till "equilibrium" [*equalitas*] of heat and moisture is reached at maturity. After that point, the heat continuing to exert its own effect, dryness soon tips the balance, with the result that the natural heat weakens. The *calor innatus* now lacks the oily moisture of its fuel:

> Therefore (we may say) that the innate heat is the cause of accidentally extinguishing itself, for it is itself the reason for its own matter being consumed. We may compare it to the flame of a lamp; the light goes out when all the matter has been used up. (1427)

The word "accidentally" [*accidentaliter*] is key here. The vital heat induces its own demise accidentally for really it strives to preserve itself; its proper activity—heating—returns to harm it. Senescence itself is a kind of accidental effect of growth and nutrition.

[68] Quoted by McVaugh, 267.

In the next step, Avicenna develops the metaphor to explain why the innate moisture passes away. The mutual loss of heat and moisture "continues unceasingly till death, and the moisture which is lost is not restored" (1428). A twist to his metaphor captures the difference between radical and nutrimental moistures:

> For there are two forms of moisture in the flame: water, which holds its own, and oil, which is used up. So, in a corresponding manner, the innate heat holds its own in respect of the innate moisture, but is used up *pari passu* with increase of extraneous heat, due, for example, to defective digestion, which is comparable with aqueous moisture of the flame. As the dryness increases, the innate heat lessens, and the result is natural death. (1429)

One might add more oil to the lamp; however, the human body adds an inferior fuel, more like the water that one might add water to a lamp to slow the burn. Its power of digestion falters and cannot produce the fourth humor.

In all, the analogy exposes two problems with defective digestion. One is that it produces extrinsic heat that further exhausts the innate moisture. According to Avicenna, the innate heat and innate moisture would maintain balance if not for extrinsic heats. Here, he mentions particularly the extrinsic heat arising from digestion, which may be the most important; however, others may come from pestilence and fevers. Presumably, at its peak, the human body replenishes as much of the radical moisture as it consumes, but at some point afterward, because of extrinsic heats, the equilibrium shifts.

The other problem with defective digestion is that, after this point, it increasingly fails to replenish the innate moisture. The image of water added to the basin of the lamp represents the qualitative distinction between the original oil and its admixture. More aqueous than the original, nutrimental moisture created by defective digestion slows the rate of the oil's consumption; however, it cannot replace the oil as fuel. Eventually, the oil burns up.

A third problem ensues from the first two. The interaction of heat and moisture produces a negative feedback loop which the lamp analogy, Avicenna thinks, helps explain. Dryness increases not only from the resolution of the radical moisture by the innate heat but also from "the lessening of

the power of the receiving matter" (1429). Desiccated, the parts also lose something of their power to absorb more nutriment, which compounds the problem of nourishing them and renders death inevitable.

Digestion is not defective all the way through life, however. Unlike some later interpreters, Avicenna does not contend that the human body can never reproduce the radical moisture, even in its youth or prime. Digestion falters later.

Avicenna divides human life into stages based on the shifting balance between the body's innate moisture and heat. The period of growth [*aetas adolescens*] lasts for approximately thirty years, during which time the amount of innate moisture remains large enough to foster growth and protect the innate heat. In the period of adulthood, or of beauty [*aetas pulchritudinis*], which lasts till roughly age forty, the innate heat and moisture strike a perfect balance, with no excess moisture available for growth but the right amount present for protecting the heat and maintaining the functions at their peak. After adulthood and till about age sixty or seventy is the period of old age [*senectus*], which medieval and early modern interpreters often term "green old age."[69] *Senectus* is a time of diminishment [*aetas minuendi*], of size rather than strength. It ends when the innate heat finally starts to decline for the reasons mentioned above. The period of decrepit old age [*aetas senum*] follows, distinguished by the centers of the body's activities becoming weak, and lasts till death (58; I.1.3.3).

Significantly, Avicenna insists that the intensity of the innate heat remains constant for much of one's life. Explaining this point, he revives a philosophical debate covered by Galen in *De Temperamentis* II.2 about whether the heat declines steadily from birth or increases in adulthood. He shortly resolves the debate in favor of Galen: the quality of the heat in childhood is moister than that in adulthood and therefore gives tactile evidence of being less intense when in fact it remains constant, as reason informs us by knowledge of the body's relatively greater moistness (60). According to Avicenna, the innate heat is steadily used up after birth, "but the loss is made up by the

[69] In the section on hygiene, this is lumped with maturity in a three-part scheme.

progressive growth." Growth maintains the constancy of the innate heat: "Even during adulthood there is no special increase or decrease in this heat" (61).

Avicenna places the tipping-point for the innate heat's decline beyond the point where Galen places it, in green old age rather than in full maturity.[70] In Avicenna's view, the innate heat declines in old age because then the radical moisture loses protective power over it: "In the end, due to some decrease in the quantity and quality of the protective moisture, heat begins to decline, so that when the senility is reached, it becomes less" (61). During maturity, the amount and quality of the radical moisture are sufficient for conservation of the heat, but not for growth, but in old age they are not even sufficient for conservation (62). Avicenna maintains that the human body must die, decline toward death in a regular pattern, and live only to a certain term, all because the resistance of the radical moisture to innate heat breaks sometime after the period of growth has ended:

> For the reason why the human body does not live any longer than it does lies in the fact that the initial innate moisture holds out against being dispersed both by the alien heat and by the heat in the body itself (both that which is innate and that which is derived from bodily movement). And this resistance is maintained as long as the one is weaker than the other, and as long as something is provided to replace that which has been thus dispersed, to wit, from the aliment. Furthermore, as we have already stated, the power or drive which operates upon the aliment in order to render it useful in this way only does so up to the end of life. (1430; I.3.1.1)

Once this resistance slips, senescence begins an inexorable march.

The lamp metaphor explains senescence as a process confined to the body. It implies the gradual, progressive consumption of the vital heat's fuel by that heat itself. If we lived as the image suggests, our heat and moisture would decline from the moment of birth. Avicenna, however, thinks that that does not happen; instead, as he claims, our heat and moisture reach a stasis in the middle of life. The lamp metaphor cannot account for this stasis. In order to account for nutrition at all, a component must be added, the supply of more moisture into the lamp from outside. But even with that, the metaphor cannot explain how the innate heat conserves its own moisture or what is really

[70] The questions whether the innate heat shrinks and, if so, when accrue great significance in the Renaissance. For instance, Jean Fernel questions how one even knows when the innate heat diminishes, and alternative theories of senescence crafted by Bernadino Telesio and Francis Bacon hinge upon disagreements about the tendencies of heat and moisture through life.

most apposite to Avicenna's analysis, the defect in nutrition occurring after the middle of life. The lamp metaphor works better once that defect is assumed.

If the innate heat and moisture strike a balance that neither can overcome on its own, as Avicenna says, one must wonder why after middle age the innate heat suddenly loses something of its optimal intensity. Clearly, the trigger of senescence is the dispersal of the innate moisture. The simple answer, then, is that the fuel of the innate heat is reduced by some other agent. The more complicated answer involves other factors not contained in the metaphor:

> Innate heat begins to decline after middle age. This is due to the dispersive effect of the atmospheric air on the moisture which is the basic material for heat. The innate heat assists this, and the various secretions of the body are also constantly drying up from exertion and emotional activity. (65; I.1.3.1)

Extraneous heats besides that of defective digestion itself drain the innate moisture. If one is not careful, much labor and emotional turmoil may burn up the innate moisture so that the vital heat has less fuel. Perhaps Avicenna thinks it impossible for anyone to maintain such a strict regimen that no food or exercise may leech the innate moisture; nonetheless, his emphasis falls on the air. The other factors assist the predation and putrefaction that the air regularly performs. In fact, Avicenna goes so far as to insist that, even if the drives and faculties worked flawlessly, the human body would still decay, because "the natural dissolution which is incidental to the aging process would prevent adequate replacement" (66). Senescence is accidental in another sense: its impetus comes from outside the body, from the action of the air.

The lamp metaphor tends to confuse Avicenna's analysis. It is almost as though he envisions two causes of senescence. One, which represents senescence proper, is rooted in innate powers of the body and depicted by the lamp metaphor. Like a lamp, the body burns itself out. Another is more mechanical, incidental, and caused by the interaction of the body with its environment. The lamp metaphor fails to grasp it, because its trigger, the air, does not affect the lamp.

Like Galen, Avicenna holds that old age emerges properly from the intrinsic nature of the creature, as an effect of the natural heat as it tries to perfect and maintain the creature, but he also

allows for an accidental source imposed extrinsically, as though the creature has enough capacity to replace what it itself consumes but not enough to replace what its environment consumes in addition. Avicenna's opinion differs markedly from that of Francis Bacon, discussed in Part Two. Bacon takes an extra step and subordinates what Avicenna thinks of as aging proper to natural dissolution. For Bacon, what Avicenna considers incidental to aging becomes principal and original.

Because the human body cannot maintain a balance between the radical moisture and heat and, moreover, cannot nourish itself perfectly, it also cannot "live any longer than it does," according to Avicenna (1430; I.3.1.1). No human can live forever. What is more, no individual can live any longer than the innately best-tempered specimen. Not all human beings last equal lengths of time even when allowed to fill out their natural terms because individual temperaments differ as well: "every person has his own term of life, during which the desiccation inevitable to his temperament (constitution) and the degree of innate heat, and of innate moisture can be withstood" (1433). There are, then, two natural limits to consider, one of the species and the other of the individual. Generally, because individuals develop from relatively warm and moist to relatively cold and dry, temperaments that are innately moist tend to live longer under comparable conditions, whereas those that are innately dry tend to decay and die most quickly.

Though somewhat variable from person to person, senescence is natural and inevitable. Therefore, Avicenna sees no need for medicine to attempt its cure. Prolonging life beyond what nature has prescribed is not medicine's object because it is impossible. Medicine can only help ensure that a patient reach the limit of life already prescribed for him by nature. That task belongs to its hygienic branch:

> The art of maintaining health is not the art of averting death or averting extraneous injuries from the body or of securing the utmost longevity possible to the human being. It is concerned with two other things: (1) the prevention of putrefactive breakdown; and (2) the safeguarding of innate moisture from too rapid dissipation and maintaining it at such a degree of strength that the original type of constitution peculiar to the person shall not change even up to the last moment of life. (1431)

The prolongation of life to the natural limit set for each person proceeds through regimen. A regimen directed toward this end contains three features: it replaces the innate heat and moisture that has been consumed "as exactly as possible"; it withholds agents inducing desiccation more rapid than "normal desiccation"; and it protects the body from putrefaction and from extraneous heats (1432). More generally, such a regimen assists the nutritive drive, responsible for replacing solids and liquids, and the pulse, responsible for replacing "what is lost by breath, namely air and fire" (1434). More specifically, it works by negotiating an equilibrium between "these several concomitant factors," which it can accomplish only with vigilance of the body's temperament in relation to the six non-naturals (food and drink, evacuation and retention, air, affects, sleep and wakefulness), which Avicenna lists (1436). Like the hygienic program outlined by Galen in *De Sanitate Tuenda*, however, Avicenna's program must be adjusted to the evolving standards of age. Avicenna proceeds to unfold the details of his program according to the three ages of life—growth, maturity, and old age (1439-1805).

At all times, hygiene prolongs life in the style of Hippocrates and Galen, by restoring balance through opposites. Avicenna's gerontology treats senescence likewise by analeptic procedures that safeguard health. Yet one finds in Avicenna, in comparison with Galen, a more straightforward disavowal of efforts to fight the body's natural tendency to decay in structure and strength. Galen at least had posited theoretically the ability of medicine to remediate senescence as distinct from disease. His practical prescriptions did not bear out the distinction, but the difference persisted in theory. For Avicenna, even the theory elides the difference. Instead of disease being largely an imbalance of qualities in the parts and senescence the desiccation, more particularly, of the tissues of heart and liver, both disease and senescence become disequilibria of pervasive bodily humors. The idea of a radical humor enforces some kind of theoretical distinction between disease and senescence, but that too fades as one reads the *Liber Canonis.* The innate temperament, determined by the radical moisture, has just as much effect on health and disease as it does on the rate at which one ages. Moreover, the innate temperament seems to be determined just as much by the primary humors as it

does by the radical. In theory, then, the difference between the processes of disease and senescence are even harder to see while, in practice, the inability of the nutritive faculty to replace the radical humor makes the task of halting or reversing senescence all the more futile since the instruments at medicine's disposal only support the faculties responsible for assimilation of nutrients.

Of course, the theoretical difference between disease and senescence refers to the way the process of each is conceived. Avicenna, like Galen, also considers senescence natural and disease unnatural or accidental. And for him, too, the inevitability of old age has much to do with its categorization as a natural phenomenon. Senescence differs from disease by that standard more clearly than it does by the standard of process.

In the Renaissance, physicians predominantly adopted Avicenna's concept of radical moisture as the fuel of natural heat. However, there is one more facet to Avicenna's physiology that must have attracted physicians and natural philosophers of the Renaissance. Galen casts doubt on the immortality of the human soul; influenced by Islamic faith, Avicenna redefines physiology to accommodate it. According to Avicenna, the temperament of the human body does not just give rise to life, it renders earthly material capable of receiving soul. As Thomas Hall has observed, Galen characterizes life as an epiphenomenon arising from "a temperate relation of wet and warmth."[71] He recognizes the three Aristotelian souls—vegetable, animal, rational—but speaks as though they, even the rational, develop out of nature's orchestrations of matter. Avicenna, on the other hand, generally speaks of life as something that matter receives. All matter except for the four elements, he says, is capable of receiving life, because compounded of the four elements (495).[72] Animals and plants receive life as an independent principle of soul that requires the correct disposition of matter to remain within it. Humans have just the right temperament to support rational soul, which in origin is supernatural, as Aristotle claims in *De Generatione Animalium* (736b20-35).

[71] Hall, 6. He cites *De Temperamentis* I.3 and II.1.

[72] I have not found this and the rest of Gruner's Lecture 7 in the 1507 Latin translation that I have consulted, but apparently other editions do contain them.

The capacity of living things to receive the three forms of soul increases with the refinement of breath, or *rooh*, the equivalent of *spiritus* in Latin and *pneuma* in Greek. The most refined, purest *pneuma* can receive the highest form of soul, the rational, and the most refined kind of breath emerges from the best temperament of earthly matter, found in the human body (497).

Avicenna's concept of *pneuma* bears comparison with Galen's idea of psychic breaths, sometimes called medical spirits, but it also exhibits traits of the late Stoic and Neoplatonic idea of cosmic pneuma, a kind of life-force adapted by Islamic theology as well. Galen of course posits ultra-fine emanations of the blood that serve as instruments of the soul whereby each part of the soul can transmit voluntary and involuntary actions to the organs, making possible the functions proper to the different organs, most importantly, digestion, the pulse, motion, and sense, and serve as a link between an immaterial psyche and a material body, enabling as well the reverse influence of the body upon the soul. He identifies two such spirits, the vital and the animal, but denies the existence of a third, the natural, which Avicenna accepts and which becomes a standard component of many later accounts of physiology although by the Renaissance many learned writers deny its existence again.

With the exception of the natural spirits Avicenna recapitulates Galen's ideas about the duties of the breath: the natural spirits coordinate the faculties of nutrition and generation; the vital spirits, the pulse and respiration; and the animal spirits, sense and motion (489-90). Additionally, this breath, though created in the heart, undergoes further alterations in other organs, as Galen attests, in order to adapt to the work those organs perform, the natural spirits arising in the liver, the vital spirits in the heart and blood vessels, and the animal spirits, after further refinement, in the brain (489). All these spirits are material bodies though invisible, composed of air and fire (487).

Differences emerge in the way Avicenna describes the introduction of breath to the body. Like Galen, he asserts that it is fashioned in the left chamber of the heart, the chamber thought to receive atmospheric air from the lungs along with a trickle of blood through perforations in the septum. Here, God produces "the breath out of the finer particles of the humors and out of heat and dryness (fire)," just as he produces the tissues from the grosser, cold and dry particles of the humors,

a parallel process begun in the liver (487). In the heart, the initial breath that gives rise to all others in the body receives the "temperamental form" necessary for it to receive the powers of the soul. Each of the three breaths (natural, vital, animal) thus possesses a different temperament depending on the thin particles of the humors out of which it is formed (488).

So far, this all may blend well with Galen's ideas; however, Avicenna insists upon the divinity at the source of the breath: "The beginning of the breath is as a divine emanation from potentiality to actuality proceeding without intermission or stint until the form (preparation, state) is completed and perfected" (488). Like the cosmic *pneuma* of Stoics and Neoplatonists, the breath bears responsibility for the entelechy of natural processes, the end-directed work by which nature brings things into being and perfects them. Again, Avicenna seems to reify Aristotle's doctrine in *De Generatione Animalium* (736b20-35) that a spirituous substance in the semen serves as the natural principle of a newly formed animal.

To Avicenna, the "nature" of a thing is the same as its "specific property," defined as "the source of movement or rest in whatever thing it occurs" (544). In compound bodies, specific properties vary with the mixture of elements, but it is this breath, "the divine emanation which pervades all things," that "makes latent energies kinetic" (547). The more refined the breath, the more powers it can release. The perfect equilibrium of contraries occurs in celestial beings, the highest form of life; however, the same celestial-grade of breath is found in human beings, enabling a rational life through reception of a celestial soul: "The breath, then, is that which emerges from a mixture of first principles, and approaches towards the likeness of celestial beings. It is a luminous substance. It is a ray of light" (498). The breath emerges from matter, as though imprisoned within it and awaiting for the right temperament that will set it free. Because of all things on earth human beings possess the most harmonious temperament, in us the breath approaches closer to its celestial, luminous form than in any other earthly thing, unleashing the activity least dampened by matter, reason.

By Avicenna's account, life is both emergent and imposed, but ultimately imposed. Matter contains within it the potential for life, and under certain temperaments life can emerge. However, that potential for life is first impressed upon matter by the divinity.

It is unclear whether Avicenna's physiology supposes a separate, immortal soul for each person, as Christian faiths usually have taught. Perhaps the soul received is lost as soon as the temperament of the body deteriorates with age, and the only immortal soul is the world-soul, as Paduan doctors, heavily influenced by Averroes, would argue. Nonetheless, the network of Avicenna's ideas seems flexible enough to adapt to the concept of an individual, immortal soul. By this interpretation, the breath, or *pneuma*, exists as ultra-fine material medium connecting the immortal soul to the mortal body. It emerges from matter but has enough affinity with immortal soul to bond with it.

Regardless of what it means for the immortal soul, however, the *pneuma* of Avicenna has profound consequences for the strength of the body and the length of life. *Pneuma* is another substance within the body that, like radical moisture and innate heat, must be preserved in quantity and quality for the body to remain strong and outlast death. It has already been noted that hygiene must assist the pulse. According to Avicenna, the pulse helps replace the elements of fire and air which the body expends when creating *pneuma* (1434; I.3.1.1). It spreads fire and air as well as the coarser particles of the blood throughout the body.

Avicenna affirms with Galen that one symptom evinced by convalescent patients, and hence by the elderly too, is a decrease in the pulse and vital breath (513). As Avicenna says, the vital breath, which is proper to the heart, maintains the functions of life by preparing all the organs for sensation and motion. The vital breath nourishes the pulse but also depends upon the pulse for its replenishment. Over time, as the body dries and turns cold, the breath necessarily grows scanty, dense, and coarse, akin to the breath emanating from melancholy, the dry and cold disposition; and, with the corruption and thickening of the vital breath, the pulse grows fainter (513).

Many articles of regimen may assist the pulse and vital breath and keep them from degrading before nature at last demands that they do. Avicenna's program for pneumatic hygiene is remarkable for its resemblances to, and probable influence by, occult philosophy and Neoplatonic mysteries. Several medicines prescribed by Avicenna are also mentioned by alchemists, natural magicians, and Paracelsian iatrochemists. When ingested, pearl, silk, myrobalan, amber, coral, doronicum, camphor, rosewater, bugloss, and lapis lazuli—also called cordials because of the vital breath's residence in the heart—all supposedly can alter the temperament of the vital breath, adjusting it for the best durability and strength (536).

The affections do more than anything else to indicate the state of the vital breath. Avicenna speaks of the strength of the breath as coextensive with the degree to which it can expand while retaining an effectual consistency. Joy erupts when the vital spirit "is plentiful…when it is balanced in temperament […and…] when it has a luminous, beautiful, and bright substance" (512). In joy, the vital breath expands. By contrast, grief appears whenever the vital spirit shows the opposite qualities, being scanty, imbalanced, and either too gross, too rare, or too confused to admit expansion. Instead, the vital breath contracts (513). Thus, one of the best ways to recreate the vital breath and thereby prolong life in the sense of preventing life's early demise is to seek out those things that will induce joy and expansion and avoid those things that will induce grief and contraction. Of course, expansion also can present problems if its intensity outstrips what the composition of the vital breath will allow. But, as long as the vital breath possesses a good temperament and bright substance, some expansion endows the body with strength. Sources of joy include intellectual endeavors such as study and friendly conversation, good fortune, success in overcoming obstacles, pleasant memories, and many other obvious items listed, Avicenna says, by the textbooks of rhetoric and morals (519). The first of all sources, though, derives its efficacy from the origin of the breath: the sight of luminous objects. An idea resonant of Neoplatonism, light comforts the vital breath because of their substantial identity (499).

We have heard that Galen and many writers subsequent to him define old age essentially as the natural loss of strength. The introduction of *pneuma* offers another material cause to explain it. In addition to the mutual decline of radical moisture and innate heat, the depletion and corruption of *pneuma* drains the organs and functions of their powers. The nutritive faculty, which depends upon innate heat and consequently upon innate moisture for its operation, may distinguish the most basic forms of life from non-living matter, yet *pneuma* invigorates life to the degree that we recognize in animals, which as the name suggests were sometimes differentiated from plants by classical, medieval, and early modern authors as truly ensouled. Still, *pneuma* too is embedded in the matrix of transformations that includes the radical moisture and natural heat, for its depletion and corruption result from the body's change of temperament.

Section (d): Scholastics

The two centuries succeeding Avicenna's death, the eleventh and twelfth, witnessed Latin translations of his *Canon*, of many of Galen's works, and of other important medical treatises such as the *Pantegni* of Haly Abbas, the *Almansor* of Rhazes, and the *Isagoge* of Johannitus. In the thirteenth century and fourteenth centuries, authors began to modify Avicenna's conception of radical moisture and senescence. At Montpellier's school of medicine, for instance, early interest in Galen's tract on marasmus gave way to adaptations of his ideas along Avicennan lines, including prolific elaborations of the lamp metaphor.[73] There and elsewhere, however, Christian doctrine infused debates about radical moisture. Though by no means simple and linear, the drift of the variations made to Avicenna's theory followed an impulse to question the nature of the radical moisture and the ability of the body to repair the human essence with earthly materials.

In the *Liber Canonis*, Avicenna proposes that, while difficult, the repair of the radical moisture is not impossible. In fact, repair would seem to occur regularly through the period of

[73] McVaugh, 268-83.

growth. But, as Michael McVaugh has noted, many thirteenth- and fourteenth-century physicians interpret the *humidum radicale* as substantially different from ordinary *cibus*. McVaugh quotes this passage from Bernard of Gordon's *Tractatus de marasmo secundum intentionem Galieni*:

> Since the human body requires food to repair its losses, and since food is not wholly and completely assimilable to the human body, life therefore cannot be perpetual. For since there is a contrariety between food and the body, and since every physical *agens* resists as it acts and every *passum* acts in resisting, the natural heat and likewise the radical moisture will be altered by food, inasmuch as the entering food will not be in the precise same point of temperance as was that which was lost, so that by a continual intake of food there will also be a continual alteration.[74]

According to McVaugh, Bernard is among the earliest medical writers to assert that the different substance of the radical moisture prevents its restoration by digested food, even by the nutrients thought to be fully assimilated into the tissues. Possibly, he uses this notion to explain how Avicenna's two internal sources of injury, the depletion and corruption of radical moisture, merge into senescence. If food cannot be fully digested into radical moisture, the radical moisture loses its ideal temperature and its quantity at the same time. Such an explanation also fits better with the dynamics illustrated by the lamp metaphor, suggesting that the radical moisture ebbs steadily from birth, as the oil of the lamp ebbs steadily from the point of ignition.

This innovation upon Avicenna, not original with the physician Bernard, seems to have emerged a little prior to him but still within the thirteenth century, not long after Avicenna's *Canon* had been translated into Latin. It came forth clothed in church doctrine. The Dominican friar Albertus Magnus (d. 1280), for example, intimates a substantial difference between nutriment and the radical moisture while pursuing questions whether youth can be renovated and old age postponed.[75] "Accidental old age" can be reversed and delayed because it results from consumption of nutrimental moistures. "Natural old age," however, "can be postponed but not avoided" [*potest retardari sed non evitari*] if one can preserve the natural power of digestion, which apparently requires safeguarding the

[74] Ibid., 276.

[75] "Quaestiones De Animalibus" in *Opera Omnia*, vol. 12 (Monasterii Westfalorum, 1955), 184-5. For a discussion of these passages, see Hall, 11.

radical moisture. Over time, though, the natural power of digestion fails to convert nutriment into radical moisture no matter what we do "because the life of each is measured to a certain period" [*quia vita uniuscuiusque certa period mensuratur*]. Because of its qualitative specificity, radical moisture counts down the life of each individual.

Shortly after Albert, Thomas Aquinas expounds a similar premise. Musing on a conundrum most likely learned from Peter Lombard—whether the food we eat can acquire the individual human form—Aquinas avers that of the two basic humors in our bodies the radical humor is our matter containing human form.[76] The other humor, the nutrimental, is matter without human form "but is on the way thereto." The radical moisture, which derives from the sperm, gives each of our bodies its specificity. An immaterial power in radical moisture helps explain how the form of an ancestor passes to numerous offspring for generations through a small, irreplaceable, and non-incremental substance. As form, it obviates the problem. In the *Summa*, Aquinas contends that nutriment is fully converted into specific human form; however, he has a slightly different opinion in *In IV Libros Senteniarum*. Here, he distinguished flesh made from sperm from flesh made from food. He reasons that when food produces human flesh it always does so imperfectly, with impurities mixed in, which eventually cause the natural demise of the body. Nutrimental and radical moistures stand apart.[77]

The substantial difference between radical moisture and ordinary nutriment was probably the single most important development to the radical moisture theory during the Middle Ages. The new variation, however, proved vexatious for both theologians and physicians. Historian Joseph Ziegler has argued that in the thirteenth century, while medical writings assumed a more scholastic style, scholastic theologians also showed an interest in medical texts.[78] Particularly interested were the neo-Augustinians at Oxford such as Nicholas of Ockham. A little earlier, in the twelfth century, the great

[76] Pt. 1, Q. 119, Art. 1. *Summa Theologica*, trans. Fathers of the English Dominican Province, vol. 1 (New York: Benziger Brothers, 1948; reprint, Notre Dame, IN: Christian Classics, 1981), 577-9. For a discussion, see Hall, 11.

[77] Quoted in Philip Lyndon Reynolds, *Food and the Body* (Leiden: Brill, 1999), 366-7.

[78] Joseph Ziegler, "Ut Dicunt Medici," *Bulletin of the History of Medicine* 73 (1999): 208-37. The following account derives from this article.

master of sentences Peter Lombard used Matthew 15:17 ("Do not ye yet understand, that whatsoever entereth in at the mouth goeth into the belly, and is cast out into the draught?") to make the case that nothing exterior to the human body can be assimilated into human essence. The second question of Nicholas of Ockham's *Questiones Disputatae* asks, "Whether anything of nourishment turns into *veritas naturae* by virtue of the operation of the nutritive power." Although, according to Ziegler, most commentaries on the *Sentences* from the latter end of the thirteenth century reject Lombard's opinion as "untenable," Nicholas insists that Lombard's agrees with the predominant *opinio medicorum* in his own day. After reformulating Lombard's statement to incorporate radical moisture, a concept not prevalent in the twelfth century, Nicholas renders Lombard's opinion this way: "food is not transformed into *veritas humanae naturae* but only maintains the radical fluid contracted by the parents and hinders its consumption."[79] In other words, nutrimental moisture delays the consumption of the tiny amount of spermatic, or radical, moisture by intervening between it and the natural heat, which would burn up the radical moisture quickly if not for the availability of another, more plentiful fuel. Nonetheless, the radical moisture gradually erodes and by old age has disappeared. At that time one lives solely by the adventitious, nutrimental fluid.

Nicholas disagrees. The opinion of contemporary physicians, which adheres to Lombard's opinion, founders on the mistaken metaphor of the lamp. Physicians distinguish between "essential flesh" equivalent to radical moisture, which derives exclusively from the sperm and not at all from aliment, and "material flesh," which fuels the innate heat and is restored by food.[80] This distinction deepens lines drawn by Galen and Avicenna. In *De Placitis,* Galen differentiates spermatic from non-spermatic parts, the former the same as the solid parts, or tissues, and in the *Ars Medica,* he claims that the solid parts cannot be re-moistened. Avicenna teaches that all parts are spermatic except for flesh and fat and therefore, unlike those, cannot be fully restored. These notions inform the lamp

[79] Qtd. in Ziegler, 219.

[80] Qtd. in Ziegler, 219-20.

metaphor as Nicholas describes it. In the metaphor, the lamp represents the whole, living human being; the wick, the radical moisture; and the oil, the nutrimental moisture. Physicians reason that while one can add more oil to the lamp, the wick once damaged cannot be repaired. If, however, only nutrimental fluid remains after the wick has dried out, old age makes a person essentially different. By contrast, Nicholas maintains that in the human body the two kinds of moisture thoroughly mix; they combine to make the body into one essential form. The nutrimental fluid protects the radical, and together they supply the *pabulum* for the "vivific" heat. The radical is still the better fuel, however. Thus, with age, the strength of the body fails because the ratio between the radical moisture and the vivific heat decreases, and also because the vivific heat, which runs the process of digestion, wears down through its own activity. At no time, however, does a person live by nutrimental fluid alone. There is no essential difference between the body in infancy and in senility. Furthermore, the span of an individual's life is set by the original ratio between the radical moisture and the vivific heat. God determines that ratio, which to human understanding remains inscrutable. Although arts can help a person reach the maximum limit planted by God, they cannot prorogue the limit.

In the field of medicine, Arnald de Villanova expresses a similar disagreement. Sometime before 1308, while a professor of medicine at Montpellier, Arnald wrote *Libellus de humido radicali* in which he challenges a view shared by his colleague Bernard of Gordon. Although in the end he maintains substantial divisions between the body's moistures, he denies that radical moisture alone serves as the fuel for the innate heat, aligning his position with Nicholas's. According to Michael McVaugh, Arnald was among the first to concentrate attention solely upon the philosophical problem of radical moisture, in particular whether it is primigenial and spermatic or a product of digestion.[81] As McVaugh points out, Arnald rejects the strict identity of radical moisture with spermatic moisture on quantitative grounds. His theory is characteristically a more natural one than those of theologians and philosophers like Albert, Aquinas, and Nicholas, who reserve radical moisture as a mysterious

[81] McVaugh, 279. The subsequent discussion leans upon this article.

substance capable of conveying the human body's essence. Thinking of radical moisture as physical, Arnald fails to understand how the tiny amount of material out of which human beings are formed can sustain the life and growth of a mature person. To solve the problem, he supposes three *humida*, one simply structural and two others requisite for life. The latter two are, once again, *humidum radicale*, acquired at generation, and *humidum nutrimentale*, produced through digestion.[82] Like Nicholas, Arnald reasons that both life-sustaining *humida* supply fuel for vivific heat; however, he conceives of them as more similar in substance than Nicholas does. The spermatic *humidum radicale*, after all, is made in the body's members (a common opinion of the time), the product of the last stages of the third digestion, where also, according to Avicenna and orthodox medical theory, *humidum nutrimentale* originates. The two *humida* are really the same substance, only the radical is endowed by the soul with a generative power before descending into the Venereal organs. Thus the *humidum nutrimentale* can furnish replacement for the *humidum radicale* while together they feed vivific heat. Barring accelerating factors, old age and death result at a rate and time fixed for each person, fundamentally because of the original proportion of the radial humor to the vivific heat, a proportion known only to God. This last idea carries the same practical consequence that Nicholas finds: physicians cannot alter the original proportion, only help prevent excessive consumption of the radical moisture by the vivific heat. Divine fiat gives the individual lifespan an upper limit beyond which it cannot cross but below which it most certainly can fall.

Perhaps the cases of Nicholas of Ockham and Arnald de Villanova are most intriguing in what they reveal about the dominant medical theory of their time. Both describe as *opinio medicorum* the belief in the substantial division between radical and nutrimental moistures, which in turn prompts another medical opinion that the human body cannot replace radical moisture with digested food. As we have just seen, the idea of radical moisture entangled a number of questions out of medieval medicine and theology; some it was employed to answer, some it raised. Originally, in Arabic

[82] Qtd. in McVaugh, 279.

medicine, the idea helped to explain why with age human beings and other animals lose their strength of body and dry out in spite of all the substance they restore with food and drink. The later refinement that considers radical moisture a special, irreparable substance has the dual effects of simplifying the process of its declination and of protecting, in theory, the divinely ordained form of the human body. The addition, however, makes solutions to new puzzles necessary. How can the radical moisture be both the product of the final stages of nutrition, as Avicenna taught, and spermatic, as it must be if it is the original vehicle of form? Furthermore, how does the initially negligible amount of spermatic moisture support the growth and functions of an organism all through its life? If it is material, we wonder how it can last so long against the consumptive activities of the body, but, if it is immaterial, we wonder both in what way it is moisture and how it plays into senescence, the very phenomenon it was first conceived to explain.

But there was one other question that the new variation on Avicenna's theory could answer, perhaps the most important for the effort to prolong life. Namely, can medicine stretch an individual's lifespan beyond what nature, acting on behalf of God, has set down? A better phrasing might be, Why cannot medicine push life beyond life's limit, or what natural means hold that limit in place? For Christian doctrine takes the inevitability of decay and death for granted. The conception of radical moisture as a special, irreplaceable substance secures the assumption while at the same time it emerges from it.

Such are the questions that Nicholas and Arnald engage. Their criticism signals a disjunction in the theory still persisting when classical medical texts were rediscovered in the sixteenth century. At first conceived as a natural substance, radical moisture takes on great theological consequence during the Middle Ages, suggesting answers to such important questions as how nature serving God fixes the term of each of our lives and how the form of our bodies is passed from generation to generation. But even the wrinkles that Nicholas and Arnald twist into the fabric of the theory preserve the dominant pattern. Through radical moisture, God caps a limit on our lives that we cannot surpass.

CHAPTER 2

SENESCENCE IN RENAISSANCE MEDICINE

Section (a): Introduction

The bulk of early modern medical writers reiterate classical and medieval physiological doctrines used to explain senescence. The most important and most pervasive doctrines are that life suffers two natural pathways of destruction in addition to pathway by violence, one being flux of substance and the other the decline in the amount and quality of the body's innate heat and radical moisture. At birth, regardless of one's complexion relative to the human mean, the body begins with the warmest and most moist temperament of one's life, but over time, especially after middle age, its complexion grows colder and drier. The coldness and dryness of old age are found in the solid and similar parts, the oldest parts derived immediately from sperm, and hence also called the spermatic parts—"bones, gristles, ligaments, membranes, nerves, arteries, veins, skins, fibres or strings, and fat"—so that, in spite of excrements of extraneous moistures such as phlegm observed in the elderly, old age is truly a cold and dry condition, not cold and moist.[1] Coldness signals a loss of innate heat although the old body may seem to the touch as warm if not warmer than the infant or youthful body because extraneous heat may increase in elder years as a result of poor digestion, a function of innate heat. The innate heat is equivalent to, or an emanation from, the so-called medical spirits (natural, vital, and animal), themselves ultrafine emanations from the blood and productive of bodily functions (digestion, pulse, and sensation, respectively).[2] Senescence thus is the inevitable decline in functional

[1] Robert Burton, *The Anatomy of Melancholy*, I.149.

[2] The doctrine of three medical spirits was common; however, as mentioned in Chapter 1, many learned physicians of the Renaissance, taking their cue from Galen, doubt or deny the existence of natural spirits and ridicule their introduction into physiology as a vulgar misconception.

vigor after a peak. As in conventional lamp and flame metaphors, the body is, in Shakespeare's words, "consumed with that which it was nourished by," for the heat that activates all the functions slowly drains and corrupts the oily moisture, the *humidum radicale,* that feeds it. The radical moisture is the quaternary moisture, more refined than the nutrimental moisture, and for some hidden reason cannot be wholly restored. Binding the solid and similar parts, it is also spermatic, perpetuated through the seed.

As we have seen, the last two points—incomplete restoration and perpetuation through seed—already provoked dissent among medieval thinkers. As we shall see, they also are two of three wedges that prevent Francis Bacon from accepting traditional accounts of senescence. Both involve questions of human form and its relation to human substance; in particular, why the human form appears to disintegrate upon the death of the body and how, nevertheless, it remains immortal and embodied through procreation. Radical moisture is a material conduit of the sperm's shaping power, an idea reminiscent of Aristotle. In the adult body, radical moisture diffuses into a glue bonding each part together and helping it to maintain its proper dimensions, density, and function. This power transferred from the sperm was often conceived as a "spirit," sometimes as heat, and sometimes as both. This spirit has a counterpart in Avicenna's vital breath, and, as related earlier, the emphasis on vital breath in Avicenna's system results in some unusual, occult prescriptions against senescence. In many Renaissance texts, similarly, the role of *pneuma* enlarges as their authors more explicitly adapt ideas from Neoplatonism, alchemy, and natural magic. Above all, *pneuma* serves to fit the human animal more firmly within a divinely ordered, and therefore rational, cosmos. The postulation of what is sometimes called cosmic *pneuma* amends in many ways the picture of senescence given in the previous paragraph. It complicates questions about the sources of human form and of life in general and about the composition and destruction of vitality. Consequently, it also justifies remedies against natural dissolution that are not found in classical medicine.

The assimilation of occult teachings into Galenic medicine was not new with the Renaissance; quite the opposite. With the promulgation of Greek editions of Hippocrates and Galen,

many medical writers sought to expunge their field of impure, medieval accretions. A return to classical principles was the new thing, next to which the continuation of ideas espoused by Avicenna, Albertus Magnus, and Roger Bacon looks traditional. Nevertheless, any too-simple antithesis between Galenic and occult medicine belies reality, for many supposedly Galenic physicians, such as John Securis, endorsed practices that sound occult, like astrology, and no occult physician, not even Paracelsus, excised Galenism root-and-branch.

Section (b): Jean Fernel

Perhaps no physiology better illustrates the fusion of Galenism with Neoplatonism and occult philosophy than that of Jean Fernel. I say this because his magnum opus, *Universa Medicina* (1567), displays the connections and groundwork of its ideas more boldly than does, say, Marsilio Ficino's *De Triplici Vita*. *Universa Medicina* is a synoptic textbook, presented as a needed successor to Avicenna's *Canon*.[3] Its supposed superiority over the *Canon* rests on the attempt to reconcile the authoritative teachings of Hippocrates, Plato, and Aristotle with one another and with those of Galen, the universities, and Christianity. Fernel does not always make neat, however; he questions long-established doctrines and in the end produces a physiology with many unique features. Several novel features derive from a broadly-defined Neoplatonic ontology, others from more controversial sources, including Paracelsus. Though considered by many contemporary physicians neoteric, Fernel nevertheless won the esteem of Gui Patin, Dean of the Paris Medical Faculty,[4] and he proved a valuable authority for Francis Bacon when the latter sought conventional medical doxology.[5] His

[3] For text and translation I have used *The* Physiologia *of Jean Fernel (1567)*, trans. John M. Forrester (Philadelphia: American Philosophical Society, 2003).

[4] Ibid., 7-8.

[5] In addition to several direct citations of Fernel, I believe that Bacon's confutations of the theory of radical moisture, to be covered in Part Two, point back to Fernel. Bacon likes to use Fernel's preferred term "primigenial moisture." As another sign of Fernel's popularity, Bacon's compatriot and friend George Herbert recommends Fernel above all other medical writers. In *The Country Parson* (1632), he claims that "any scholar" can rise to sufficiency in physic by seeing one anatomy, reading one book of physic, and keeping one herbal. "And let Fernelius be the physic author," Herbert continues,

Physiologia, a part of the *Universa Medicina*, has been called "the high-water mark of European Galenism."[6]

Of greatest consequence here is Fernel's discussion of spirit, which begins with some apprehension about the entrenched idea of "vital heat" [*calor vitae*]. A few pages after he has rehearsed the standard account of the aging process to a tee (246-7), he doubts the conductor of the whole show. It is not that he denies that living things possess heat; comparison of a body when living and when dead indicates as much (256-7). Nor is it that he refuses Aristotle's dictum that heat is life; he patently affirms it. The problem lies in the nature of the heat. As everyone admits, Fernel says, everything lives by heat, even snakes and "the whole races of cold plants." The evidence of living things that are without doubt temperamentally cold yields by syllogism the conclusion that the heat of life "is above the nature of elements" [*supra elementorum naturam esse*]. Because any dominant element must quash its weaker counterpart, there is no way a cold creature could live if the heat responsible for its life were the same as the heat that contributes to its temperament. Therefore, "this vital heat must be of some surpassing origin, and not reek of the coarser nature of elemental fire." Citing Aristotle, Fernel affirms that the opposite of vital heat is not cold but death, its lack. In other words, vital heat has no opposite but, like light, is either present or not (258-9). Without opposites, life cannot emerge from a combination of natural elements, as fire does (260-1).

Fernel seems to parrot Aristotle and Galen, who also insist upon the distinction between the heat of life and elemental fire and who leave aside the former as an occult mystery, the aritfex of nature surpassing nature but somehow working through it. Stranger ideas follow as Fernel dips into the Platonic well. Vital heat, according to Fernel, is "like an extraneous addition" imposed upon natural substances from without. It is supernatural, metaphysical. Its metaphysical *ontos*, however,

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"for he writes briefly, neatly and judiciously; especially let his method of physic be diligently perused as being the practical part and of most use." See *The Complete English Poems*, ed. John Tobin (New York: Penguin, 1991), 235.

[6] John Forrester in Fernel, *Physiologia*, 5. Admittedly, "Galenism" has great laxity, but Lester King also uses Fernel as one of three early modern representatives of Galenism in "The Transformation of Galenism" in *Medicine in Seventeenth Century England*, ed. Allen G. Debus (Berkeley: University of California Press, 1974), 7-31.

poses a problem for its immersion in the natural world. Heat "pure and simple"—Fernal conceives vital heat as almost the Platonic form Heat—requires a "means of transport" capable of dispersing it throughout the whole body instantaneously. Obviously, its vehicle must be "fluid"; however, no bodily humor is swift enough to account for its evident speed (260-1). So,

> a material of the most rarefied substance was required as a basis for the heat, fast-moving, to be at the same time an intimate associate for fostering the heat. Since a thing of that kind is airy, or if you prefer a more correct name, ethereal, on the best reasoning it is the sort of thing that should underlie heat, being always on fire like ether, and with heat continuously resident in it, so that neither can be parted from the other. (260-1)

As Fernel notes, Plato and Aristotle did not quite know what to call this ethereal substance, sometimes designating it "spirit" and sometimes "heat," "innate heat," "fire," or "hotness," names meant to acknowledge, on the one hand, "its rarefied and fast-traveling nature" and, on the other hand, "its powers and effectiveness." Fernel, though, clearly prefers the example set by Hippocrates, who "never hesitated to call it spirit, because it baffled vision, yet possessed exceptional powers." This ethereal substance warrants the name *spiritus*, for, like the corporeal substances "air, and wind, and breeze," it nevertheless possesses invisibility (260-1).

Ethereal spirit is very much a natural substance for Fernel although it is extremely rarefied. In Ptolemaic cosmology, the ether was the surpassingly thin medium of the stars, which produced light without heat. Superlunar but not divine, the ether and stars occupied the threshold separating the earth from the realm of God. This common concept of highly rarefied ether offers Fernel a convenient vehicle in which to carry vital heat, which is truly divine and hence incorporeal. The Stoics, according to Fernel, made a mistake when they equated their natural, corporeal, invisible spirit permeating the universe with soul and failed "to track down anything more excellent and divine" (260-1). By contrast, "the Academics," by which Fernel seems to denote Neoplatonists in the vein of Plotinus and Porphyry, first realized that the union of things of disparate natures requires a third thing as an intermediate bond:

> They considered that before our soul [*animus*] (the work of the supreme craftsman of things) appeared and entered into this compact solid body, it was clad in some

> shining body, pure and starlike, as a simple garment, and this, being immortal and eternal, could never be parted from the mind, which could not become an inhabitant of this world without it. (260-3)

These words echo passages from Plato's *Timaeus* (41b-42a) and Plotinus's *Ennead* IV.3.15, describing psychogenesis. From this point, Fernel begins to bridge the obvious gap lying between an otherworldly, immaterial, and divine Heat and the immortal *animus*, which also may be translated as "mind," the highest kind of soul. The shiny and starlike cloak of the *animus* is not yet Fernel's ethereal spirit, however. This cloak is immortal and eternal, like the stars and perhaps like the angels often associated with the stars. The analogue of Fernel's ethereal spirit appears at the next step:

> Then they [the Academics] went on to place another body around the mind [*animo*], a thin and simple one, but rather impure, less shining and bright than the previous one. This one is not the work of the supreme craftsman, but composed from a mixture of elements, particularly the more rarefied ones, from which it acquires the name airy and ethereal. (262-3)

Thus, vital heat resides in living things through the aid of something akin to the airy and ethereal garment of the Neoplatonists, the second covering around *animus*. For Fernel, though, Neoplatonic notions threaten to misrepresent the truth of the matter, for the Neoplatonists attach their ethereal cloak only to mind, the purest form of soul, whereas reason dictates that it also should cover "the rest of the transient parts of the soul" [*caeteris animae partibus caducis*]. The word for "soul" here, the more general "*anima*," comprehends the nutritive and animal souls, to which Fernel alludes as the soul's transient parts. These require an ethereal vehicle too because, he says, the mortal part of the *anima*, though less pure than mind, "still ranks far ahead of this earthy composite body, so that it cannot attach to it without a link" (262-3).

When Fernel spreads ethereal spirit to all parts of the soul, he purports to fit theory more snugly with reason but also to align Academic teaching with what Aristotle says or, sometimes, with what Fernel interprets Aristotle to say. Lurking behind Fernel's treatment up to this point is the famous avowal by Aristotle in *De Generatione Animalium* (736b20-35) that the third and highest part of the human soul, the rational, enters the body from without rather than epigenetically, like the other two parts—a statement often deployed to show Aristotelian philosophy's conformity with

Christianity. When Fernel finally mentions this idea, he pairs it with Aristotle's succeeding statement that soul is "enclosed in seed and a foamy body" in order to draw out from the Stagirite the commodious claim that spirit works as a bond between corporeal and divine natures. Additionally, he draws upon Aristotle's statements that that a star-like natural principle lurks in the spirituous foam of the semen and activates all the functions of the soul and that the matter associated with the different parts of the soul differs, as they do, in their relative nobility. With these statements, Fernel justifies his claim that the embodied ethereal spirit varies in nobility just as the parts of the souls and their functions do and that every function and part of the soul, including the mortal parts, is associated with a different spirit. Syncretistically, Fernel concludes:

> [I]f we weigh up with steady judgment the reasonings of both Aristotle and the rest, it will become evident that each part of the soul depends upon some spirit as its basis, through which it resides in the body and discharges all its duties. So spirit is an ethereal body, the dwelling and bond of heat and of the faculties. (262-3)

These sentences diverge farther from the generally accepted physiology than they first might seem. The infusion of Neoplatonism that has carried Fernel to this point is crucial to the departure. For one, vital heat is now soul. As hard as it is to imagine how heat could exist apart from elemental bodies, Neoplatonic dualism enables Fernel to hold that vital heat is metaphysical. Although Galen had doubted the analogy between vital heat and fire, after Avicenna the vital heat depicted by medical theory had verged closer to the elemental. Christian interpreters, furthermore, often separated innate heat from the immortal soul, as Aristotle had done. Secondly, from the necessity of an intermediate term joining body and soul, Fernel arrives at the diffusion of ethereal spirit throughout the body, the main point of the sentences just quoted. This does not sound odd until one reads on and witnesses the more concrete outcome of this notion. The spirits of our bodies, as opposed to the ethereal spirit on its own, are a compound of the divine and the corporeal: "Neither heat on its own, nor rarefied substance that we grasp separately in thought, but the product of their linked association will truly and properly be called spirit" (268-71). Once set in creaturely bodies, spirits admit degrees of quality. In accord with most portrayals, the three medical spirits, which Fernel dubs "wandering spirits"

[*errantes spiritus*], rise in nobility from natural to animal, the last approaching closest to ether. But more ethereal still and purest of all are "innate spirits." Innate spirits reside in all the similar parts, which are the original parts made from sperm and hence the parts most truly innate. The innate spirits maintain the consistency and functions of all the similar parts and, in conjunction with radical moisture, produce our sensible "innate heat," whereas, flying through the arteries and nerves, the wandering spirits stimulate the faculties traditionally assigned to medical spirits, digestion, pulse, respiration, and sensation (296-7).[7]

Another innovation resulting from Neoplatonism, and perhaps the most interesting, also pertains to spirit. Traditional physiology had taught that respiration serves two functions: by inhaling, to cool the native heat and spirits, especially vital spirits; and by exhaling, to discharge polluting vapors. Fernel adds a third use for air, which is to nourish the spirits. In his review of Neoplatonic psychogenesis, Fernel apparently accepts the correspondences to which the theory gives rise, an impression confirmed in *De Abditis Rerum Causis*. In the original account found in Plato's *Timaeus*, the *anima* informs all the world, which itself is a kind of animal. The hierarchical microcosm of man thus replicates on smaller scale the hierarchical macrocosm that he inhabits. The notion was reified for centuries until the great Hermetic sage Pico della Mirandola could affirm, in the fifteenth century, "Man…collects and joins to the completeness of his substance all the natures of the world."[8] Because of a commonality of elements, the substances that constitute the human body have correspondents in the world-animal. Because man has a fixed status in the cosmos, however, the earthly substances in and immediately surrounding the human body are less noble than those of celestial realms to which they correspond.

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[7] Fernel introduces what seems to be another unique feature in his *Physiologia* when discussing the vital faculty. Traditionally, this faculty controls pulse and respiration. Fernel adds that it also distributes life to all the parts, preserves all parts against rot, and "embellishes bodies with a more excellent and wholesome kind of life" than that of plants. For Fernel, the vital faculty is the integrative faculty, responsible for the greater degree of wholeness that Aristotle says distinguishes higher life forms. See Fernel, *Physiologia*, 366-71 and 384-9.

[8] From "Heptaplus," trans. Douglas Carmichael in *On the Dignity of Man* (Indianapolis: Hackett, 1965): 135.

Fernel relies upon an understanding of the cosmos as a stratified network of analogies when he reasons that the spirits within the body requires the nourishment of air. Ethereal spirit combines both heat and a rarefied substance. Through this second part of its nature, it corresponds to the air, a degraded, denser kind of rarefied substance. The "compact mass" [*densa moles*] of the human body does not need air, because it derives proper nourishment from its similitude, the "coarser [*crassiore*] provision formed of all the elements" (264-5). Undoubtedly, though, we inhale for a reason, and the spirits also need restoration. Thus,

> [A]ir has to be inhaled and drawn in, to be linked to kindred substance and to any that is of its kind in us, and to turn (as it were) into food for it. If we had not rarefied and spirituous substance in us, there would undoubtedly be hardly any need for us to inhale. (264-5)

The *pneuma* within our bodies is replenished by the *pneuma* without, or, more precisely, by the external *pneuma* lying closest to us, air. In the *Physiologia* section of *Universa Medicina*, Fernel says nothing about the possibility of the body's *pneuma* being restored by celestial *pneuma*, an idea sometimes provoked by the pattern of correspondences.

The spirit attracts air as like attracts like, the same principle dictating that air also nourishes spirit's fiery nature, vital heat. Famously, Fernel makes one of the earliest and plainest statements that ordinary fire uses air as its fuel: "It is to foster [life] that we inhale air, which supplies not just cooling for the body (this could be got some other way) but also nourishment" (264-5).[9] From ordinary flame he extrapolates to the necessity of a fuel for life's fire: "The spirits in us, imbued with a rarefied heat resident in ethereal substance, corresponds by analogy [*proportione*] to what is properly called flame" (268-9). One might suspect that the equivalence previously observed between heat and the divine, immaterial *animus* would nullify the analogy between elemental fire and innate heat; however, the desire to analogize overrides Fernel's earlier impulse to separate, and he commits to the comparison censured by Galen in *De Marasmo.* Ordinary flame can feed on three kinds of

[9] Fernel challenges Aristotle's thesis that we inhale air for refrigeration, not for nourishment (473a2-6). His idea may owe something to the Paracelsian concept of aerial niter.

substances, a "smoky substance," "ambient air," or an oily substance akin to lamp-oil, and often feeds on all three. Likewise, innate heat burns three kinds of fuel: a fatty humor like oil that by far is the most inflammable and corresponds to the oily sulfur contained within of inanimate objects readily enflamed; a nutrimental moisture that is less inflammable and created through digestion; and a "watery humor" by which all earthly things living or inanimate cohere, sometimes also called the "elementary humor." Fernel justifies the analogy with experience by means of a commonplace example. When ignited, a branch of greenwood catches fire slowly at first because of all the nutrimental moisture residing within it; however, once that humor burns off, the oily humor ignites and the branch burns more rapidly till only the watery humor bonding its elements remain in the ashes (268-9). The longevity of trees and humans introduces the same kind of drying process as flame, but more gradually: nutrimental moisture burns soon and regularly; next, the oily moisture is consumed over longer time; with its disappearance the living creature dies; and in the end, only the watery moisture remains in the rotten corpse (268-9, 292-3).

The oily moisture is, of course, the "original moisture" [*humor primigenius*], the term that Fernel typically uses in place of radical moisture. As the most inflammable of the humors, it is the innate heat's proper fuel and therefore has a determinant role in the process of maturation and the rate of decline. In humans, the innate heat is produced by the innate spirits dwelling in the similar parts, where they represent one-third of a triple substance, solid, fleshy, and spirituous. The innate spirits reside "primarily and mostly in solid substance" of the similar parts alongside the primigenial moisture, the earthy sediments responsible for solidity, and the watery or elemental humor uniting the earthy sediments. The primigenial moisture gets its name from the fact that it along with vital heat derive from the sperm, whereas the fleshy substance of the similar parts derives from the maternal blood (278-9). Shortly after conception, the sperm spins out like a spider "fibers and warps" [*fibrae et stamia*] that become "the permanent and truly solid substance of similar parts, congealed from pure seed" (278-9). Thus, the spermatic substance of the similar parts conveys the "forms" of all the parts, forms being, in the words of historian Lester King, the "immaterial," "dynamic," and "irreducibly

real" agent of shape and function so important to late Galenists.[10] The maternal blood wraps around them, building flesh of all kinds; however, the flesh of the similar parts admits of great changes to its amount, increasing and decreasing with nourishment, whereas their spermatic and solid substance decreases only by age (278-9).[11]

From here begins Fernel's dual account of development and senescence, which is instructive. It is instructive because of its emphasis on continuity from growth to decline. His account suggests intimacy with Galen's works. An infant enters the world warm and moist. The heavy supply of moisture in youth enables growth, not just nutrition and the maintenance of the body's warmth. Like a craftsman, the vital heat shapes the organs and members by drying them, consuming much moisture in the effort. By drying and hardening, vital heat improves strength of limb till bones, nerves, and sinews cannot grow anymore. Then a person stands at greatest vigor, with dryness enough to make parts solid and strong but not so much as in old age, when it stymies the innate heat. But after the age of maximum vigor, the quality and intensity of the innate heat necessarily gives way: "All the underlying fuel for the heat burns out in the blaze of the vigorous stage of life, so that thereafter the violent all-devouring heat can spread itself no further" (286-7). The final stages of a natural life resemble those given in other portraits: the original moisture can support the heat no longer; without original moisture rapidly drying, the heat fades; and the body sinks to its coldest and driest condition yet, incapable of life (286-7).

What is striking in this picture is that bodily vigor does not simply track the intensity of vital heat. Once the vital heat is submerged in earthly matter, the vigor of the body it inhabits becomes a function of the combination of vital heat with earthly materials. Fernel measures the vigor of the

[10] King, "The Transformation of Galenism," 12.

[11] Fernel's declaration that, unlike the fleshy substance, the solid substance of the similar parts "cannot be reduced except by the advance of years and of age" suggests that he envisions, as Arnald de Villanova does, nutrimental moisture as guarding the depletion of radical moisture by the vital heat rather than adding to, however defectively, the amount of radical moisture. Here, Fernel does not allow for the depletion of the solid substance of the similar parts by anything but age, including hectic fevers; however, I have not yet had the opportunity to examine Fernel's discussion of fevers to find out if he sticks to this view.

composite, not just the intensity of the power source. The vigor of the whole improves toward maturity even as vital heat wanes because some amount of dryness enables the parts to work better. Dryness gives them proper shape and resiliency.

We might call this conception of vitality holistic vigor. Holistic vigor is a conception of vitality and bodily strength as a combination of material structure and some immaterial force whereby one is just as important as the other. The concept of holistic vigor marks the physiologies of Aristotle and Galen. Fernel uses it, too. Later, it characterizes Francis Bacon's analysis of functional strength although Bacon's physiology differs from Fernel's in that it rejects the notion of vital heat as divine and immaterial.

Holistic vigor contrasts, however, with the physiologies of writers whom I shall discuss momentarily. Thinkers such as Roger Bacon, Marsilio Ficino, and Paracelsus tend to ground functional strength in the divine or cosmic source of life. Accordingly, maintaining vitality and prolonging life are, for them, largely a problem of bolstering the life-principle in its conquest over corruptible and corrupting matter. A second difference follows from the first. In spite of Fernel's sustained interest in occult sciences, human longevity is, for him, largely a consequence of good temperament sustained and restored through proper therapeutics, and he expresses no clear belief in prolongevity. Indeed, Fernel posits natural decline and death as inevitabilities stemming from the impossibility of increasing, replenishing, or purifying the original, spermatic moisture. Other thinkers indebted to ideas of world soul and occult powers teach prolongevity as a potential benefit of harnessing the divine *pneuma* seeded in all things. Fernel does not venture so far, in part because of his adherence to the Galenic belief that the human body needs the natural elements for its particular brand of perfection and that those elements are given and cannot be changed or improved.

In the dialogue *De Abditis Rerum Causis*, written two decades prior but included in editions of *Universa Medicina*, Fernel is concerned with the concept of "total substance" and with diseases of

total substance.[12] A total substance is the "completeness and wholeness, in which each single thing consists" [*Tota rei substantia perfectio est et integritas, qua res unaquaeque consistit*] (532-3). The human body is a total substance, but so is each of its similar parts. Total substance is also "form" in a very active sense, the metaphysical power that enables disparate components to work together as a whole (522-3). Diseases of total substance affect the similar parts out of which the human body develops; in particular, they affect the spirituous constituents of the similar parts, in addition to the elements and temperaments that more common diseases affect. It is the project of occult medicine to remedy occult diseases, which are a specific kind of disease affecting total substance. Manifest diseases of total substance include senescence and death; the quenching of spirits by "insomnia, overwork, starvation, and extreme pains"; and putrefaction of the similar parts (532-5). They are called manifest, because their sources are apparent to sense, whether watchfulness, failure to eat, anxieties, extinction of heat by "strangulation or cold," or a change in the substance of the parts. They have obvious remedy, to supply as well as art can a corrective quality. Occult diseases are so named because they have causes "more remote" (536-7). Poisons, infectious airs, and the stars impair health by means not directly attributable to an excess or defect of some sensible quality but possess virtues comparable to the human body's active "form," which they threaten to countermand. They penetrate to the body's form via the spirit which shares a connection with the world soul (700-1). Their remedy is likewise occult, relying upon applications that are better proven than understood. Effective medicaments work through their whole substance, through the efficient cause resident in every part of a natural thing, whereby that thing is made whole.

The notion that certain diseases operate through their own specific virtues smacks of Paracelsian etiology, and, as one might expect, the discussion turns in the direction of a chemical physic. But Fernel tempers the notion of quintessence, a prime factor in natural magic, alchemy, and Paracelsian iatrochemistry. Quintessence is the pure form of a natural object, a "seed" of being with

[12] For text and translation of *De Abditis* I have used *On the Hidden Causes of Things*, trans. John M. Forrester (Boston: Brill, 2005). Parenthetical citations refer to page numbers in this edition.

all earthly dross removed. In chemical philosophy, this quintessential seed is implanted in all things by cosmic *pneuma*, the world soul. In Fernel's cosmology, quintessences exist; however, human power over them is more limited than alchemists and Paracelsians would claim: "There is nothing in any part of nature that does not contain within itself the seed of its kind, yet this can hardly be extracted by technical skill" (714-5). Fernel doubts the ability of alchemists to refine away the seed or quintessence of each thing by fire and chemical solvents. Alchemists are emphatically wrong, however, to try to create gold by means of an elixir made from mercury or sulfur, the two alchemical principles. The forms of nature are too mysterious and fixed to permit such profound degrees of human manipulation. Natural forms cannot be reduced to deeper principles. Deeper principles may not even exist. The only thing that houses the quintessence of gold is gold itself (714-5). Fernel falls back upon an old argument against alchemical metallurgy, expressed most influentially by pseudo-Avicenna, that only nature, or in this case, perhaps the divinity, can make gold.[13] Nonetheless, divine dominion over forms does not preclude the ability to refine gold as it is commonly found for medical purposes: "[L]et it be enough for us to coax out from individual things something sound and very pure, for that supreme power of occult properties to reside in" (718-21).

Fernel's example demonstrates the moderate infusion of Neoplatonic and occult sciences that distinguishes much of early modern thinking about the human body and its relationship to the world. It illustrates the attitudes and preconceptions found in so many medical texts of the period. Fernel acknowledges the ultimate rule of divine providence and struggles to make physic faithful. While venerating classical authors as the greatest of pagan authorities, he also makes room for medical practices not explicitly endorsed by them yet found in preceding and contemporaneous texts of natural magic and alchemy. But even his expectations for these practices, by early modern standards, are normal. He believes that mineral medicines and spiritual remedies may defend against especially potent diseases arising from both inside and outside the body; however, he scoffs at the literally

[13] Accordingly, Fernel rejects atomism, too, on the basis that qualities as we perceive them are not reducible. See King, "The Transformation of Galenism," 19.

transformative power advocated by certain devotees of the occult sciences—the skill to separate the seeds of all things from the materials in which they are embedded.

Although Fernel speaks little about the human lifespan *per se*, his denial of the last point would seem to restrain ambitions for prolongevity. As a "disease" of total substance, old age requires for its postponement or reversal a remedy of total substance; the restitution of original moisture, however, is something that Fernel, at several points, denies.[14] Additionally, his greatest literary achievement, *Universa Medicina* pertains overwhelmingly to therapeutics. It contains no book devoted to hygiene and the conservation of health. Instead, as defined in *Methodi Medendi*, "the benefice and duty" [*munus atque officium*] of medicine is "to cure."[15] And the art of cure, according to Fernel, is profoundly limited in what it can achieve against the "internal disaster" [*intestina calamitas*] of age. Even if the mythical father and master of the art, Aesculapius, should tend a patient with ideal temperament and prevent all external and internal causes of disease, Fernel speculates, his patient will "still get progressively worn out and consumed spontaneously, until he breathes his last."[16] Although I have found no place where he speaks directly about the prolongation of life, it is hard to imagine that, as a physician, Fernel does not believe that the medical art prolongs the lives of sick patients whom it heals; however, nothing suggests convincingly that Fernel harbored prolongevist schemes—not even his limited advocacy for chemical medicine and occult remedies. Many other physicians thought that to ensure patients reach their full potential of life and ward off all diseases one had to combine Galenic hygiene and therapy with knowledge of astrology and occult properties and to combine herbal simples with mineral elixirs and cordials. There is no good reason to think that Fernel was radically different.

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[14] Fernel, *Physiologia*, 292-3. His discussion of the increase of radical moisture in this passage is hypothetical, dependent upon subjunctive verbs. Also see 278-9, discussed above. At 246-7, he insists that the natural alteration of temperaments by age is "the internal disaster, which no human skill or diligence can escape, or even postpone."

[15] Jean Fernel, *Universa Medicina* (Lyon, 1586), 329. For other parts of the *Universa Medicina* not included in Forrester's modern edition I have consulted this edition.

[16] Ibid., 246-7.

Section (c): Marsilio Ficino

To illustrate the effects of Neoplatonic and occult philosophy on ambitions for greater life extension, it is better to look at two of Fernel's likely influences, Marsilio Ficino and Paracelsus. Ficino is a good example of the physician just mentioned, one who strives to use all intellectual and practical resources at his disposal in order to promote health and longevity. Like Fernel, he also seems averse to the prospect of extending human lives to supernatural limits, this despite a barrage of what now look like strange, magical, and otherworldly cures, most of them explicitly directed at prolonging life. Instead, Ficino channels his efforts to a more defensive cause, the task of improving the health and increasing the longevity of scholars, who as a class are prone to shorter-than-average lifespans. Although not perfectly clear, his objective seems to be the natural limit common to mankind, not a point beyond it.

Ficino's major work on health and longevity, *De Triplici Vita* (1489), is divided into three books written and circulated at different times, *De vita sana*, *De vita longa*, and *De vita coelitus comparanda*.[17] As Ficino explains, scholars suffer pertinacious diseases and truncated lives because they are subject to phlegm and melancholy, the first arising from too little bodily exertion, the second from too much mental exertion. In the course of the text, however, melancholia emerges as the greater problem, for it also characterizes the natural temperament of most scholars. As taught by the pseudo-Aristotelian *Problems* 30.1, great intellectuals tend to have melancholic temperaments, which Ficino interprets as the foundation of the Heracleitian "dry light," the supreme kind of human intelligence. Wetness clouds thinking; hence, a danger of phlegm. The melancholic temperament carries a liability too, however. Cold and dry, it resembles the constitutions of old age and death. Thus, relative to the human temperamental mean, scholars begin life closer to a senescent condition and closer to extinction; they are, so to speak, on a shorter time-table. More than most people,

[17] Parenthetical citations refer to page numbers in Marsilio Ficino, *Three Books on Life*, trans. Carol Kaske and John Clark, 2nd printing (Tempe, AZ: Medieval and Renaissance Texts and Studies, 1998).

however, scholars need a length of days because, as Hippocrates also taught, *vita brevis, ars longa*, that is, "art is long and we can only attain it by a long life" (510-1). Ficino seeks to secure for scholars the practice of their craft to the best degree and to the greatest length possible through aiding the body on which that craft partly depends. He insists that control over the length of life lies in human hands:

> But a long life is not just something the fates promise once for all from the beginning, but something that is procured by our effort. This is both acknowledged by astrologers, when they deal with elections and images, and confirmed by the careful concern and the experience of physicians. (510-11)

The two sciences most concerned with prolonging life are astrology and physic. According to Ficino, the medieval physician Pietro d'Abano also testifies to this use for these two sciences, and he derived his opinion from Aristotle, Galen, and Haly Abbas, all of whom allegedly concur that "the end of one's natural lifespan is not predetermined from the beginning in every detail, but is able to be moved farther or nearer…both by the stars and by material things" (232-3).

The physic that Ficino describes in Books 1 and 2 is many ways conventional. In 1.4, he propounds three causes of melancholy among scholars, "celestial," "natural," and "human," a top-down, outside-inside order that his demonstration across three books more or less reverses. Each book speaks about all three; however, the brunt of emphasis of Book 1 falls on human, of Book 2 on natural, and of Book 3 on celestial.[18] *De vita sana* reads like a typical *materia medica* although oriented specifically to melancholic scholars; it is full of detailed lists and recipes. Concerned primarily with the human cause of melancholy and phlegm, it addresses pathological causes rooted in the body, such as superfluities and the dispersal and enervation of spirits, and remedies for their ill effects. These causes are "human" because they relate to what we choose to ingest. Along the way, Book 1 incorporates customary discussions of humors, temperament, and the natural, vital, and animal spirits, with an emphasis on therapy through counterbalancing qualities.

[18] I do not know whether I am making an original claim about the organization of *De Triplici Vita*. I have not found it elsewhere. Certainly, the divisions suggested by the titles of the individual books matters more, but the emphasis on the causes of disease also changes from book to book.

Some early manuscripts of *De vita sana* also bore the title *De cura valetudinis eorum qui incumbunt studio litterarum*. Book 2, *De vita longa*, provides its hygienic and geriatric counterpart. After the pattern started by Galen, this is as expected for a book focused on longevity. Book 2 cites rules and regimens of hygiene first for scholars generally and then for the old (whether these are old scholars is not completely clear). The rules for young scholars aim to keep them as warm and moist as possible, warning specifically about foods tending toward coldness, over-moist, dense, and readily putrefying but extolling moderate exercise, spirited wines, and pleasant company, odors, and songs (172-87). The regimen for the elderly relies heavily on Arabic and medieval writers such as Avicenna, Haly Abbas, and Rhazes. Most prescriptions are grounded in the premise of contraries, fitted to the cold, dry, and weakened condition of older patients. In many instances, the regimen for the elderly harkens back to Galen: egg yolks, honey, sweet wine, moderate intake of foods easy to digest, gentle but frequent frications, and a warm habitation (188-91, 198-201).

Health and longevity differ less than the titles of the first two books would suggest. For example, in *De vita sana*, Ficino allegorizes "three monsters" [*tria monstra*] especially menacing for the health of scholars. They re-appear in *De vita longa* as dangers for longevity. Overindulgence in earthly Venus and Priapus disperses the spirits but also drains vital moisture, both effects especially dangerous for scholars and the elderly (122-5 and 208-15). Bacchus threatens to attack the head with noxious fumes borne from excessive or sharp wine and to dull the mind and spirits with repletion of food, but digestion is also "the root of life," directly affecting the radical moisture with its product, for better or worse (124-5 and 172-3). Hecate, or watchfulness, especially into the wee hours of the night, harms the intelligence, but it also threatens the body's natural moisture with "resolution" (124-5 and 168-9). Together, Books 1 and 2 render the distinct impression that if one takes care of daily health, longevity follows. Book 3 in many ways underscores the same point. The succoring astral or daemonic spirits drawn down from the heavens improve health and longevity at once. Ficino does not refine their distinction in Book 3, because he believes that cosmic *pneuma* instills a vitality which cannot help but enhance everyday health along with longevity.

Beginning with *De vita longa*, however, he exhibits departures from Galenic principles. Early chapters of Book 2 carry over the discussion of human causes of melancholy and, along with that, discussion of human remedies, but they introduce the concept of a "vital" or "natural" humor. At first, this sounds like the traditional *humidum radicale*; it is the fuel of life's fire, an airy and most pure oil that can extinguish the body's flame if it becomes too sparse, too abundant, or too corrupt. Nonetheless, it differs from traditional conceptions in crucial respects. First, Ficino omits the textbook distinction between *humidum radicale* and *humidum nutrimentale*. In fact, I do not believe that the term *humor radicale* appears anywhere in *De Triplici Vita*.[19] He also omits any discussion of the Aristotelian concept of solid and similar parts, where learned physicians taught that radical moisture resides. Whether the omissions are deliberate or not is hard to say. A priest and philosopher rather than a university-trained physician, Ficino may not have delved into scholastic debates regarding radical moisture theory; however, he cites multiple authorities, such as Avicenna, who insist upon the difficulty of restoring radical moisture because of the body's inability to refine nutriment to a spermatic purity. Either way, the omissions have the effect of suborning his exhortations to longevity by rendering the *humor naturalis*, *humor vitalis*, or *oleum vitale*, the terms he prefers, more capable of replenishment. Under Ficino's handling, the humor fueling life does not sound absolutely mysterious and irredeemable. The natural moisture may be the same as the blood or constitute some portion of the blood, which feeds the heat of the heart.[20] Without discussion of the third and fourth stages of digestion, anyway, the difference between blood and vital humor is neither clear nor consistent—as it is not for many literary writers who care little for technical distinctions.[21]

[19] Kaske occasionally translates the unmodified noun "*humor*" as "radical humor" when she thinks this is Ficino's intention (169). My point is not that Ficino has stopped thinking with anything like the concept, only that his explanations diminish radical moisture's "radical" quality, the thing that makes it so difficult to repair. His overwhelming preference for the unmodified "*humor*" and for "*humor naturalis*" reflects his slant on the theory.

[20] "For Rhazes teaches that to preserve youth you should use things which lead blood to the heart, condense there, and warm the heart. Avicenna approves this, warning us to avoid watery and perishable blood" (176-7).

[21] Ficino refers to the fourth digestion as the process producing semen. Tellingly, he prescribes as a counterbalance to Venus foods "similarly digested in the fourth digestion, namely, a fresh, whole, raw egg along with sugar and a little saffron,

The oil received at birth is "as airy as possible, pure, and by a natural viscosity steadfast and firm" (170-1). Its substitution requires only "*euchima*," or "wholesome foods that impart good nourishment, which is to say, good blood" (174-5). Wholesome foods are those bearing qualities in closest resemblance to the qualities of the vital oil. Three wholesome foods in particular are the "fine moisture extracted from an eel," "the oil extracted by sublimation from the turpentine tree," and, above all, olive oil (176-7). In an allegorical passage, Ficino depicts Minerva filling human bodies with their original, vital oil; she appears "bearing an olive, the source of vital oil" (168-9). One wonders if the emblem renders an equation rather than an analogy. Such naturally-occurring oils exhibit the combination of airiness and viscosity proper to the vital oil. Accordingly, they produce such blood and moisture to sustain innate heat: "For such blood and moisture, like oil to the flame, thus acts as sustenance of the vital heat and has firmness as well as fineness" (176-7). Very nearly, Ficino's conception debases radical moisture to good but ordinary nutriment.

A second distinctive mark upon Ficino's analysis of health and longevity is that, despite repeated elisions between the sources of health and longevity, certain remedies depend upon the contrast between health and longevity, by which I mean that practical measures taken to improve longevity are recognized either not to assist health or to impair it. There is one example in particular. He calls it "the rule of the Chaldeans" [*Chaldaeorum regula*], a title he may have lifted from Roger Bacon.[22] Except for the name, this supposed remedy might not seem to have any association with the Hermetic tradition, which, from an early modern European perspective, was connected to the Chaldean race through Zoroaster, perhaps a teacher of Hermes Trismegistus. Roger Bacon, though, credits the Chaldeans with much medical lore directed toward longevity, in addition to metallurgic alchemy that modern scholars acknowledge. This lore may have infused Hermetic alchemy as well.

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human milk or that of a pig or goat taken with a little honey" (210-1). Again, the passage testifies to Ficino's greater-than-average confidence in the restitution of natural moisture.

[22] See Roger Bacon, *The Cure of Old Age and the Preservation of Youth*, trans. Richard Browne (London: 1683), 61-2.

According to Ficino, the rule of the Chaldeans, which he says he "perhaps" [*forte*] should recommend, runs as follows:

> gradually to purge out foreign humors which the body has incurred, both the more internal by the appropriate medicines and the more external by rubbings and baths and provocations to sweat; and during that time to fill the body little by little with healthy and long-lasting food. (218-9)

This rule pertains to the recovery of youth [*ad iuventutem recuperandam*], and Ficino's hesitation stems from the danger that such recovery poses to present health. In fact, as Ficino progresses, his concern for health forces him to assign more drastic purges to patients of fewer years. Severe purges, especially those of the "more internal" putrid humors by medicines, often are done, according to Ficino, by physicians using prepared poisons of viper and hellebore. Such poisons threaten the constitutions of old men who may receive for their trouble "the youth that was promised by Medea to the old Pelias," whom Medea cut up and boiled in a cauldron (218-9). "For according to Hippocrates even the young quickly grow old if they take medicines that purge totally" (218-9). Rather than risk drying and debilitating old men even further, Ficino heeds the "gradually" [*gradatim*] written into his own phrasing of the rule and recommends lighter purges concocted of aloes and myrobalans (218-9).

The rule of the Chaldeans that Ficino describes is interesting because of the postulate hidden within it that health and youth may sometimes stand in opposition. The promises made by enterprising physicians with their rejuvenating poisons manifest the belief that, beneath the processes of sensible health and disease, lies another, deeper process that hygienic and therapeutic remedies aimed at sensible health and disease cannot touch. In the present passage, the senescent process is characterized as a gradual build-up of putrid humors. Even Ficino's more tempered prescriptions rely upon a belief in senescence as such. According to his physiology, natural or vital humor would appear to yield more readily to renewal; however, as seen here, it still suffers from some inevitable defect in its re-creation over time, generating elderly persons with more corrupt humors than younger ones. If Ficino were trying to make his account more "naturalistic," one would expect him to explain why nourishing moistures of superior quality, such as olive oil, nevertheless fail to restore vital

moisture. The fact that he does not, evinces his reliance upon traditional theorems, a reliance that really is not in much doubt in a book predicated on the early demise of scholars because of their cold and dry temperaments.

In the history of medicine, however, the Chaldean rule exposes divisions of thought along a criterion possibly at work here, too. As far as I have been able to observe, the prescription for longevity by wasting and restoring the body tends to follow writers who trim the distance between nutrimental and radical moisture. Fernel, for example, installs the flesh and spermatic moisture of the similar parts in ontologically separate categories, and consequently he denies that fluctuations in the amount and quality of flesh, which one would see under the Chaldean rule, impinge upon the radical moisture. By contrast, Galen, who of course did not employ the concept of radical moisture instead speaking of the body's moisture generally, advises purges and alimentary restitution as a means of restoring feverish patients in *De Marasmo*. Centuries later, the early modern physician Laurent Joubert, who defends the principle of altering innate temperaments by medical means, picks up on this as a proven method of genuinely prolonging life, one supposedly already used by many physicians in hectic cases. Roger Bacon's approval of the Chaldean rule has already been mentioned; one of earliest prolongevists in Western Europe, he asserted that proper dieting could restore and enhance radical moisture. His contemporary, Arnald de Villanova, also touted the efficacy of drastic purges followed by resupply of more wholesome nutriment, and, as previously shown, Arnald coupled radical and nutrimental moistures as products of the third digestion. Later, the Chaldean rule enters Francis Bacon's *History of Life and Death* where his endorsement underscores the difference between health and longevity and follows his explicit rejection of the concept of radical moisture, which he replaces with the concept of bodily "juice" [*succus*], a simple product of digestion.[23]

As I have already said, the so-called Chaldean cure is one of the few prescriptions offered in Renaissance medicine that abide by Galen's division between the two φθοραί leading to death. By

[23] Most of these examples have been discussed. For Arnald de Villanova, see *The Defence of Age, and the Recovery of Youth*, trans. Jonas Drummond (London, 1540), Biii v – Biiii r.

far, the vast majority of prescriptions for longevity approach their goal from the other side of the divide, attempting to reach a maximum lifespan by restoring matter lost through flux as efficiently as possible. This one proposes to do it by remedying the dryness that, according to Galen, properly distinguishes the φθορά that is old age. After the introduction of the concept of radical moisture, it would seem that such a "wasting" cure for old age became more doubtful. When mentioned in medical texts, it tends to relate to hectic fevers, the analogue of old age among acute diseases, rather than to old age itself; in hectic cases, physicians seek to purge a deeply embedded poison. When the wasting cure does relate to old age, medical writers frequently invoke it as something occult and foreign to Galenic medicine, which they do when they call it Chaldean. Those who find it applicable to old age may find it so because they already believe, as Ficino seems to, that the body's natural moisture is more capable of repair than commonly thought.

Another departure from classical medicine elaborated in Book 2, and even more so in Book 3, is represented by spiritual sympathies, which may compensate in some way for the earlier demystification of radical moisture. As early as 1.2, Ficino stresses the importance of *spiritus* for the activities of scholars. Notably, Ficino prefers to speak of the spirit residing in the human body monolithically rather than in its separate grades, natural, vital, and animal.[24] A "pure, subtle, hot, and clear" vapor of the blood, *spiritus* supports the senses, which in turn support reason. After the blood is made by the vital power, it ascends to the heart where the vital power generates the spirit, which then travels to the brain, where the soul "uses it continually for the exercise of the interior as well as the exterior senses" (110-1). The spirit is the instrument [*instrumentum*] whereby scholars "are able in a way to measure and grasp the whole world" (110-1). Yet, as Ficino complains, scholars utterly neglect proper care of their perceptive instrument. All the rules of hygiene and therapeutics point to the spirit, the last bodily part in a chain leading to sense and thought:

[24] Ficino does acknowledge the three kinds of spirits; however, the preponderance of the instances of "s*piritus*" go unqualified. Of course, among the three, he seems most concerned with vital and animal.

> [U]ndoubtedly the contemplation is usually as good as is the compliance of the sense; the sense is as good as is the spirit; the spirit is as good as is both the blood and those three forces which we mentioned—i.e., the natural, vital, and animal, by which, through which, and in which the spirits themselves are conceived, born, and nourished. (110-1)

The spirit yokes body and soul. Remedies immediate to the spirit therefore have a profound virtue in the production of health and longevity. Book 1 presents medical remedies intended in part to guard against the dispersal of the spirit, but most work through the pathways of nutrition. In the latter chapters of Book 2, however, Ficino begins to adopt more remedies of natural and celestial orders, which depend heavily on the spirit as a link between body and soul and as the earth's intercessor with the divine.

Such spiritual remedies purportedly work because of analogies embedded in all portions of the cosmos. This is the Neoplatonic notion previously encountered in Fernel, who probably learned something of it from Ficino's works. The universe consists of an array of emblematic natures organized in a hierarchy ascending from material elements to the divine Mind, with all parts, however distant and disparate, actively united through the ubiquitous World Soul. Ficino limns his cosmology in the initial chapters of Book 3. The key to unlocking the puzzle of the cosmos is "the spirit inside the World's Body," which emanates from the World Soul and spreads throughout the cosmos, like the corresponding spirit inside our bodies (246-7). This cosmic spirit or *pneuma* is the key to puzzle, enabling us to use the powers of distant objects. It is the key in two senses; one, because when sequestered in each thing it inhabits, it represents that thing's quintessence, the hidden power that transcends the object's sensible qualities and elemental temperament; and two, because in us, our quintessence is that spirit by which we "measure and grasp the whole world" (246-7).[25]

Occult remedies drawing upon these hidden powers lurk in both the sphere of the earth and the sphere of the heavens, just as a scholar's melancholy has, in addition to the human cause of diet,

[25] Ficino's definitions of *spiritus* are famously confusing. Agreeing with D.P. Walker, Kaske thinks that Ficino separates bodily and cosmic spirits into separate but analogous kinds (43). They are at least this. Sometimes, Ficino verges on claiming their identity. Also see D.P. Walker, *Spiritual and Demonic Magic* (London: The Warburg Institute, 1958; reprint, University Park, PA: Pennsylvania State UP, 2000), 3-29.

natural and celestial causes. The natural cause is the mysterious influence emanating from contemplation's likeness with the earth. The celestial cause comprises the planets Mercury and Saturn, which are associated with study and memory and unfortunately have chilling and drying effects (112-3).

On earth, the underlying fabric of correspondences enables the passage of quintessences of material bodies. Hence, one thing of like kind can imbibe something of the efficient cause of another. Most important of course is the passage from one object into the human spirit. For instance, the most durable and pure of elemental substances, gold, when properly prepared, can pass on something of its temperateness and purity to the human spirit (194-5, 230-1). Likewise, the blood of youths and shunamatism—the laying beside of a young woman—can transfer youthful spirit from young to old (188-9). Ficino shares with Fernel a belief that the spirit is directly influenced through sympathies: "like is nourished by like" (220-1). The spirit feeds upon its earthly correspondent air; respiration is meant not only to cool the heart and expunge fumes but to nourish the spirit (222-3). Thus, "most important to life…is choice of air" (222-3). The spirit works as a synecdoche of the whole person, delighting in the sight of living greenery (204-5), in pleasant music (212-3) and savory odors (222-7), in conversations with friends, and in the company of youths (200-1). Ficino's pneumatology turns anthropomorphic at times: "feed it daily with sweet odors; and delight it with sound and song" [*hunc quotidie suavibus odoribus alite; hunc sonis et cantibus oblectare*] (224-5).

Ficino counsels readers "to keep human life in a certain equal proportion of soul to body and to nourish and augment each of the two with its own proper foods and exercise" (212-3). The addition of spirit from outside the body enhances health and longevity by solidifying the connections between body and soul made tenuous by intellectual studies. The "natural cause" of melancholy is the occult dynamics between the soul in contemplation and the analogous earth. When steeped in thought, "the soul must draw in upon itself from external things to internal as from the circumference to the center" (112-3). The line echoes a passage from the *Commentary on Plato's Symposium* in which Ficino reveals that the human soul as image of all the cosmos must seek knowledge of the

cosmos by turning toward its own center.[26] This centripetal motion of the soul, however, comes with a bodily cost:

> Now to collect oneself from the circumference to the center, and to be fixed in the center, is above all the property of Earth itself, to which black bile is analogous [*persimilis*]. Therefore black bile continually incites the soul both to collect itself together into one and to dwell on itself and to contemplate itself. And being analogous to the world's center, it forces investigation to the center of the individual substances, and it carries one to the contemplation of whatever is highest, since, indeed, it is most congruent with Saturn, the highest of planets. Contemplation itself, in its turn, by a continual recollection and compression, as it were, brings on a nature similar to black bile. (114-5)

In looping chains, contemplation draws out black bile as a by-product, and black bile pushes the soul ever inward, deepening contemplation, lifting it by a second mysterious link with Saturn, yet ultimately harming the body. After a while, a profusion of melancholic humor renders the blood dark and thick and less nutritive. It has a salubrious effect on spirits, however. Emanating highly rarefied, quick, yet stable spirits, melancholia promotes the most crystalline thinking and assists the intellectual activity of scholars (120-1). By another simile, contemplation is like death, disconnecting soul from body. The contemplating soul "overreaches its body above what the corporeal nature can endure" (114-5). "Natural" remedies for the spirit bypass the nutritional processes and reinforce spiritual ties to a soul that repeatedly attempts to leave its own body before it can.

The spirit uniting body and soul receives an exceptional boost from astral influences. Book 3, *De vita coelitus comparanda*, is devoted to the art of obtaining those—to the right times according to zodiacal proximities for preparing and administering medicines, to the celestial associations of earthly compounds, to the use of astral talismans and figures, as well as to an apology of astral or daemonic magic as a natural magic rather than witchcraft and devilry. Many contradictory and sophisticated arguments have been written about Ficinian magic and its instruments; however, it is probably not too presumptuous to say that, according to Ficino, as well as to many other Renaissance

[26] II.3, trans. Sears Jayne (Woodstock, CT: Springer, 1985), 48: "Clearly it is proper that created things collect themselves to this their center, to this their own proper unity, before they cling to their creator, in order, as we have now often repeated, to be able, by clinging to their own center, to cling to the center of all things."

physicians and philosophers who considered astrology a science like any other, astral spirits have an effect not unlike that of radical or vital moisture on the length of human life. Whether or not this effect is absolutely determinate was a matter for debate. Ficino expressly contends that it is not. According to him, the planets of Mercury and Saturn, whose influences the scholar would like to have for the sake of study and memory, can shorten life through their cold and dry properties, but, on the other side, the favorable powers of the "three Graces"—the Sun (hot), Venus (moist), and especially Jupiter, the medial grace—can prolong life if one knows how to harness them (258-65). If "accommodated" correctly, the benefices of stars can overcome even natal horoscopes: "Without a doubt, your own careful attention and the care of doctors and astrologers can so arrange things that the stars both give faithfully what they promise and even extend it further with a fuller increase" (236-7).

Accommodation happens through the correspondence of our spirit with the *spiritus mundi*, as the consumption of air by spirit was said to happen earlier, except that now the human spirit mingles with something more pure than itself: "by application of our spirit to the spirit of the cosmos, achieved by physical science and our affect, celestial goods pass to our soul and body" (254-5). Bolstered by the cosmic spirit and the rays of stars, with which it has affinity, our spirit becomes "more like celestial things," which means thinner, lighter, and quicker, the qualities of spirit that fire contemplation (254-5).

The planets and stars have such great command over human life and can restore the human spirit so efficiently because the spirit of the world that lodges most purely in heavenly bodies, especially the Sun, is Ficino's life-principle, "the medium by which the divine soul may both be present to its grosser body and bestow life throughout it" (256-7). Consisting of all four elements but especially of air and "stellar fire," this cosmic *pneuma* bestows life everywhere. Apparently, it possesses this ability by virtue of its surpassing subtlety. Through the cosmic *pneuma*, the World Soul germinates and develops the "seminal reasons" implanted in matter, which dictate forms. The spirit of the cosmos is thus an efficient cause impelling things toward their proper forms; however, it

infiltrates every part of the World's Body, even the supposedly inanimate ones. Gems and minerals also develop in the earth, and their motion, however slow, signals a life-force within them. As conventionally understood, life distinguishes those things that can pass on the seminal reason of their species to other things born from themselves. The wedge between animate and inanimate as normally understood, procreation cannot happen in certain inanimate objects such as gems and minerals because the thickness of their matter precludes more dynamic motions of the cosmic spirit within them. Nonetheless, all things contain the source of life, for all things contain some portion of cosmic spirit (254-7).

Ficino's dualist cosmology represents a new wrinkle in humoral accounts of senescence. Like cosmic pneuma, the human spirit that stems from it is a life-principle. Thus, it approximates an independent source of vitality and health: "The spirit indeed is what lives in us first, and most of all, and as if it alone lived…Therefore people who wish to lengthen their life in the body, should especially cultivate the spirit" (224-5). Unlike Fernel's ethereal spirit, which protects and cherishes the vital heat, Ficino's spirit seems to be the vital heat itself ("as if it alone lived"). As *De Vita Triplici* progressively clarifies, when the blood exudes spirit, it is emitting not just a rarefied, elemental composite but also a mysterious yet corporeal agent of human entelechy. This spirit is threatened by the gross substances upon which it works. The natural decline brought on by old age is the closing of the surrounding gross substance by coldness and dryness, which, like the hardness of gems and minerals, prevents the spirit's movement. Astral magic and, to a lesser degree, other spiritual remedies inhibit or reverse the process by instilling vitality at its source.

Most vital theories based on life-principles set functional powers over the material composition of parts: if the principle of life is strong enough, it can prevent the breakdown of parts. In the last book Ficino's emphasis on spirit suggests a kind of linear flow of life from principle to the grosser material through which it passes. But really the last book advances a trend begun in the first two, which start with a tribute to spirit, aim at the enhancement of intellectual activities, and show little regard for the mechanics of radical moisture. The traditional theory explains senescence

through the circulation from underlying material to heat and back again, vitality failing because of a hidden problem with material re-composition. Instead, Ficino builds toward the point that the human spirit can draw strength from something besides radical moisture. This is an astounding departure from the physiology of Aristotle although it is not new with Ficino. Galen and Avicenna speak as though life is both epigenetic and metaphysically imposed. Ficino wants it both ways too; however, the drift of *De Triplici Vita* runs decisively in the second direction. The outstanding consequence of the apotheosis of human spirit is that the life-principle is no longer enslaved to the economy of earthly materials. True, to Ficino's mind, many spiritual and astral remedies merely suborn the body's metabolic processes, enabling them to work better; however, the most magical of his remedies, the use of astral figures and talismans to attract celestial spirit, for example, are conceived as circumventing the cycles through which the parts receive nutriment and the native heat fuel. They nourish the spirit directly.

This cosmic avenue of restitution makes Ficino more optimistic about prolonging life, but it presses even harder two questions heard before. One is that which the radical moisture theory is almost designed to answer, namely, why the *archē* of the human body gradually becomes impotent. Undoubtedly, Ficino would fall back on the oppression of the spirit by gross matter, an answer heard in his *Commentary*.[27] This answer comports, too, with the radical moisture theory that Ficino still does not abandon because, under certain constructions, both insist that no earthly matter can sufficiently fuel spirit and native heat. This answer prompts the second question, however. If the purified cosmic spirit can enter the human body and fortify the principle of life, how long can the human body live? Ficino hazards a vague guess: as long as the fate that the stars give and maybe longer. This fate, however, is the fate of horoscopes, which pertains to individuals, not the universal fate of humanity and the maximum lifespan. A profusion of magical remedies and some vague references to alchemy may have solicited from some early modern readers—and, more so, may solicit

[27] V.3-4.

from us—an expectation of supernatural intent, but Ficino's silence on the topic obstructs an easy interpretation. Ostensibly, he wishes for scholars who otherwise would suffer abbreviated lives to fill out a natural term. We may think that supernatural, spiritual forces were sought to transcend the natural term, but Ficino and other early moderns may have sought them to complete it, as a countermeasure against more infectious spirits and stars that would curtail life.

Section (d): Paracelsus

Paracelsus, by contrast, overtly declares prolongevist schemes. He was one of the few early modern physicians to do so. His psychological and cosmological theories bear comparison with those of Ficino and other Neoplatonists, and, like Ficino, he advocates a bevy of medical tactics for health and longevity. But Paracelsus goes beyond Ficino in several ways, one being that he theoretically grounds all remedies in "*entia*," or what later disciples often referred to as divine "signatures," which approximate the "quintessences" depicted by Ficino and Fernel. Everything possesses an *ens*, according to Paracelsus, which at one point he defines as "a cause or a thing which has the ability to govern a body" (*Paramirum* 8).[28] In this definition the emphasis falls on the verb "govern," for an *ens* is an efficient cause, a form-perpetuating agent that holds things in being. Famously, Paracelsus believes that diseases also possess an *ens*, called the *ens veneni*, and thus he departs from humoral medicine and the Galenic precept of cure by contraries. Though not wholly scrapping the physiology on which they were based, Paracelsus insists that the physician observe "what it is that poisons the body and not so much that the body lies there in a poisoned state" (*Paramirum* 8). Later Paracelsians often defended their physic as "sensible" rather than "intellectual," as concerned with true "*dunameis*" (in the words of English physician Richard Bostocke) rather than with "dead

[28] References are to *Volumen Medicinae Paramirum*, trans. Kurt F. Leidecker (Baltimore: The Johns Hopkins Press, 1949). Other texts by Paracelsus are taken from *The Hermetic and Alchemical Writings of Paracelsus*, ed. Arthur Edward Waite, 2 vols. (London: James Elliott, 1894; reprint, Whitefish, MT: Kessinger, 2002).

properties."[29] As Paracelsus describes him, the good physician, being a devout Christian, understands that God has made all things perfect in themselves, that nothing contains a poison by virtue of itself, and that diseases have their own life-courses (*Paramirum* 24-5). Disease-inducing poisons infiltrate the human body because things absorbed into it are made for themselves, not for humans, and thus parts essential to them are poisons for us (*Paramirum* 24). To eliminate disease, the physician must understand the *ens* of the aggrieved part and apply a remedy of like kind in order to bolster its natural, preservative power (*Paramirum* 30-3).[30]

Paracelsus sees greater curative potential in the *ens* than Ficino apparently finds in his corresponding idea of cosmic spirit, in part because of the former's confidence in chemical physic. Despite a mutual interest in Hermetic philosophy, Paracelsus is much more invested in alchemy than Ficino, who barely alludes to the science in as Hermetic a work as the *De Triplici Vita*. In contrast, Paracelsus purports to revive a truly ancient and Hermetic medicine based on chemical analysis. This spagyric art is also more divine than pagan medicine, whose founders, Aristotle and Galen, ignore divine creation of the world, cast doubt on the immorality of the soul, and resolve all matter to four elements rather than to a unified *mysterium* (Waite II.250). Hermes Trismegistus and Plato share the revealed knowledge of Moses. In *The Philosophy Addressed to the Athenians*, Paracelsus reads the creation story of Genesis in an alchemical key, demonstrating God as the great alchemist of the world who fashioned all things out of the created *mysterium* through a series of separations (Waite II.252-3). Conceived as the art of separation, alchemy understands all matter as resolvable to its *tria prima* of elemental essences, mercury, sulfur, and salt (a modification to the mercury-sulfur binary of medieval alchemy). Likewise, it can separate impurities from the *ens*. In *De Triplici Vita*, Ficino notes the

[29] Richard Bostocke, *The Difference between the Ancient Physicke…and the Latter Physicke* (London, 1585), Hv r-v.

[30] This is the justification of the like-to-like cure given by the Paracelsian Oswald Croll. I have yet to find a justification of the same by Paracelsus himself. Possibly, Paracelsus has in mind here instead the cure of one poison by another, which Croll also discusses. See *Philosophy Reformed & Improved in Four Profound Tractates*, trans. Henry Pinnell (London, 1657), 114-25.

therapeutic powers of minerals and metals if physicians can retrieve the quintessence of each.[31] Paracelsus maintains that through their furnaces and alembics chemists can penetrate to those signatures and produce chemical medicines of great power, greater than that of herbal simples (which chemistry also may improve).

Understandably, much of the scholarship regarding Paracelsian medicine has investigated the rivalry between Galenic and chemical physicians during the late sixteenth and early seventeenth centuries. The usual concern with theoretical and actual differences between rival therapies, however, is not my concern here. Despite those important differences, the iatrochemists who came after Paracelsus, or at least the texts by them that I have read, either ignore direct references to the prolongation of life or speak of it in a more conservative sense than he and in the same sense that most Galenists intend, which is that resulting from the salvation of life against disease. Perhaps later chemists thought it enough to argue that chemically prepared medicines prolong the lives of patients by actually removing diseases without going on to claim power enough to increase the human lifespan. Perhaps they were put off by what they honestly considered absurdities. Certainly, on the other side, some opponents of the chemical philosophy relished the premature death of Paracelsus as a performative contradiction of his chemical theories.[32] So maybe they reacted with restraint. For whatever reason, later Paracelsians express less interest in prolongevity. As Allen Debus has observed, about the only one who discusses Paracelsus's long, disjointed, and enigmatic *De vita longa* is Jacques Gohory (Leo Suavius), and he portrays his master as a veritable knock-off of Ficino.[33]

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[31] Ficino, *Three Books on Life*, 256-7.

[32] Examples include Henry Cuffe, *The Difference of the Ages of Man's Life* (London, 1607), 71-2; and James Hart, *Κλινικη, or the Diet of the Diseased* (London, 1633), 6.

[33] Allen Debus, *The Chemical Philosophy* (New York: Neale Watson, 1977; reprint, Mineola, NY: Dover, 2002), 146. Gohory's *Compendium* (Basel, 1568) was published under his nom de plume, Leo Suavius. Gohory is better known for his translation and alchemical interpretation of *Amadis de Gaule*, to which Francis Bacon alludes in *The Advancement of Learning*.

My concern is how Paracelsus justifies prolongevity. His commitment to prolongevity distinguishes him not only from most of his followers but also from my preceding examples. Of course, that commitment also reproduces an interest found among preceding alchemists, especially Roger Bacon, who was a preceding iatrochemist to boot. Medieval alchemists generally believed that the philosopher's stone doubled as the *elixir vitae*, perfecting both metals and living bodies. Although they tended to put metallurgic practices in higher prominence, the object of their chemical magistery was no less a "medicine." Under this codification, historian Lyndy Abraham defines the elixir as "the universal panacea capable of curing man of all weaknesses and diseases, rejuvenating him and transforming him from earthly to illumined man."[34] The identity between the stone and elixir of life emerged from a cosmology, traced to Aristotle's *Meteorologia* (378c) and several Hermetic writings, that represented all things in the world as activated by a universal world spirit, or *pneuma*, which strove to perfect human beings by making them healthy and eternally vigorous no less than it strove to propel the development of metals in the earth into becoming gold, the perfect metal.[35] As Harry J. Sheppard has noted, the purpose of the alchemical art was to assist nature in its process toward various perfections, a process that when left alone inborn diseases of matter perpetually arrest.[36] In other words, it was to free and energize the *pneuma*, akin to the Paracelsian *ens*, which Paracelsus himself sometimes calls "spirit." The philosopher's stone is "the supreme crystallization in form of the precious life-essence," which when added to metals dispels their corruptions or when drunk eliminates diseases and all defects of body leading to old age.[37]

Roger Bacon elevated the prolongation of life higher than did most alchemists. He writes that through primarily three means—a strict regimen of non-naturals, occult medicines, and astral

[34] Lyndy Abraham, *A Dictionary of Alchemical Imagery* (Cambridge: Cambridge UP, 1999), 123

[35] See F. Sherwood Taylor, *The Alchemists* (New York: Henry Schumann, 1949; reprint, New York: Barnes and Noble, 1992), 15-23.

[36] Harry J. Sheppard, "European Alchemy in the Context of a Universal Definition" in *Die Alchimie in der europaischen Kultur-und Wissenchaftsgeschichte*, ed. Christoph Meinel (Wiesbaden: Otto Harrasowitz, 1986), 16.

[37] Abraham, *Dictionary*, 145-6.

sympathies—the human body can live for perhaps hundreds of years, perhaps as long as, but certainly no longer than, the limit set upon human life by God immediately subsequent to the Fall, which debars immortality.[38] Like Roger Bacon, Paracelsus takes the augmented longevity of the Biblical patriarchs, as well as the reports of great-aged alchemists such as the legendary Artephius, as proof that the human lifespan can stretch much farther than normally seen. Usually, early modern physicians, divines, and philosophers who doubted projects to increase the human lifespan itself deployed a variety of interpretive strategies to defuse the unimpeachable evidence of the Old Testament. One of the most common was to suppose, as Laurent Joubert does, that a special divine grace was dispensed to the patriarchs for some extraordinary purpose requisite to a newly created world, usually either procreation or the acquisition of natural knowledge. Another was to suppose that the world and all its contents have gradually decayed from the Fall to the present day and thus that the human lifespan has naturally shrunk—one of the greatest of early modern prejudices standing in the way of prolongevity.[39] Although agreeing about the possibility raised by the Old Testament accounts, Roger Bacon and Paracelsus fall out over the reason that in latter days humans tend not to live as long as distant forebears; adopting some features of the decay narratives, Roger Bacon attributes the difference of lifespans to intemperance in regimen, the degradation of the human seed, corruption of the air brought on by overpopulation, and the loss of knowledge regarding the hidden properties of things, whereas Paracelsus attributes it only to the last of these.[40]

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[38] In *De retardatione accidentium senectutis, et de prolongatione vitae humanae*, collected in the *Opera*, ed. J.S. Brewer (London: Longman, 1859), 538-42, R. Bacon concentrates on strict hygienic regimen. This text constitutes one portion of *The Mirror of Alchimy* (London, 1597), and may be spurious. In *The Cure of Old Age and the Preservation of Youth*, trans. Richard Browne (London, 1683), R. Bacon discusses similar hygienic rules but also ventures into the miraculous curative effects of certain herbs and minerals. The *In libro sex scientiarum in 3o gradu sapiencie* he explains the assistance rendered to alchemy by astral influences. This text appears in *Opera hactenus inedita Rogeri Baconi*, ed. Little and Withington, vol. 9 (Oxford: Clarendon Press, 1928), 183-4 and is quoted by William R. Newman, "An Overview of Roger Bacon's Alchemy" in *Roger Bacon and the Sciences*, ed. Jeremiah Hackett (New York: Brill, 1997), 317-35.

[39] Two other explanations are that the ancient Hebrews calculated years by months and that they lived strictly as vegetarians.

[40] The first two causes that Roger Bacon identifies, in the order listed here, appear in *De retardatione*, 540. The last two appear in *The Cure of Old Age*, 1.

Like Ficino, Paracelsus repeatedly insists that human beings have control over their fates and that the stars and planets do not determine us (*Paramirum* 13-14). Raising to a higher register the apology that a number of his disciples would make in defenses of chemical medicine generally, he calls out skeptics who presume that present-day lifespans are set by stars or by divine ordinances: "Nor let us think that we must die on some precise day, sooner or later, or that it is derogatory that a Christian should believe it possible to prolong life by medicaments created by God for that purpose" (Waite II.113). Paracelsus evinces no belief in the decay of the world.[41] According to him, Adam was "the first inventor of arts" (I.48). Living to extraordinary lengths is a matter of rediscovering Adamic alchemy, still applicable to today's world:

> For the most part we lack wisdom, so that we are unable to judge what is in existence which is useful to us, especially since we altogether ignore our powers in this respect. Adam, whom we think the wisest of mortal men, had perfect knowledge of these matters. Although he was deprived of the tree of life, this is not a matter of theology, but of medicine. There *is* a natural tree of life—the tree of the soul. (Waite I.113)

Characteristically, Paracelsus speaks with boasting confidence; his ambition seems to know no bounds. The Fall is not theological doctrine but natural. Longevity requires only that we uncover the right secret. He even suggests that he outdoes the most ancient artist. Although the wisest of man died, Paracelsus can restore the tree of life, the soul. Truly perfected alchemy can return Eden, which Adam failed to do. The sole limiter to human immortality is the general destruction and renewal of the world, God's final alchemical separation when the impurities hidden in the elements dissolve away and their forms rise to eternity: "It is not against Nature that we should live until the renovation of the world: it only passes our comprehension" (Waite I.113). "That is mortal which cannot remain until the destruction of the world. That is immortal which will await such destruction, though these very things are themselves mortal" (Waite I.115).

The alchemical method for such immortality depends, according to Paracelsus, upon the intelligent control of the *entia* affecting us. In the *Paramirum* he identifies five such *entia*, each given

[41] A comment in the *Paramirum* about evil being on the increase may be an exception (59).

its own book—*astrale*, *veneni*, *naturale*, *spirituale*, and *dei*. The last differs from the first four as "Christian" rather than "pagan." Ultimately, "all health and sickness comes from God," as do the medical arts, because God is responsible for the beings of all things; however, God sometimes sends "inflictions." The final book of the *Paramirum* makes concessions for the failures of medicine due to the will of God, who alone regulates the "time and duration" of every disease. It exalts faith-healing. Although "there is no medicine for death, only for diseases," God does work miracles, and "if he works miracles, He does it humanly and through human agency" (60, 58). The faith-healer surpasses the physician in dignity (59).

The first four *entia* lie in the domain of the physician. As Paracelsus asserts in *De vita longa*, "no disease causes death" (Waite I.108). Death is a problem for the faith-healer whereas the physician handles diseases. No disease causes death, for all diseases have their sources in the four *entia*, which are beings in their own right and therefore desire to preserve themselves: "Natural sickness abhors death, and every member of the body avoids it" (I.108). In the Renaissance, death from old age represented a logical conundrum for many natural philosophers and physicians: if all natural things seek to preserve their lives, which undoubtedly they do, then why do they contain the seeds of decay, that is, essentially kill themselves. The solutions tended to be either that death was actually unnatural (the outcome of the Fall of Adam) or accidental (a side-effect of a living thing's struggle to preserve itself, as in radical moisture theories).[42] Paracelsus's answer works in a way similar to the second in that it conceives death as accidental; however, the accident results from the interaction of *entia* all maintaining themselves in their unities. For instance, the *ens astrale* does not perform those actions the vulgar imagine—fixing times of death, changing fortunes, differentiating the characters of persons: "the stars do not control anything in us, they mold nothing in us, they do not irritate anything, they bias nothing…" Rather, "they are free by themselves and we are free by

[42]See, for example, Henry Cuffe, 49-51 and 73 and Fernel, *Physiologia*, 286-7. Among John Donne's paradoxes is "That all things kill themselves," a chapter which begins, "To affect, yea to effect their owne death all living things are importuned, not by Nature only which perfects them, but by Art and Education, which perfects her." See *Iuvenalia, or Certain Paradoxes and Problemes* (London, 1633), 12.

ourselves" (*Paramirum* 16). The trouble with the solution presented by most radical moisture theories is that the fault attaches to parts; the only unity, the only *ens* involved is the animal or person as a whole, who still seems to die of the body's own instinctual drives. Paracelsus's solution goes further and allegedly saves his premise that everything is made perfect, that nothing contains poison.

Of the four *entia* upon which medicine works—*astrale*, *veneni*, *naturale*, *spirituale*—the first three associate with "the body," the last, *spirituale*, with "the mind," also the medium of the *ens dei* (*Paramirum* 48). By *ens spirituale* Paracelsus refers to the "spirit" emanating from a mind that turns against reason (49). In the mind, the "will," not reason, produces spirits, and through will one person can suffer injury from another who turns spirits against him or dreams evil dreams about him, their two spirits battling without use of their bodies (51, 54). On the other side of the divide, *ens astrale* denotes "something we do not see, something which sustains life in us and in everything that is alive and sentient" and which derives from the heavens (18). More precisely, the *ens astrale* denotes "the odor, vapor, exudation of the stars as mixed with air." The vapors from stars are poisonous to us, whereas from the air proceed cold, heat, dryness, and moisture, which have a great influence on health and on the timing of medical treatments (20). The *ens veneni*, already discussed, signifies the poison entering a person's body through sustenance. Finally, the *ens naturale* indicates the microcosm of the human body. Like the wheel of the heavens or the seasons of earth, it undergoes cycles in its various parts, and these cycles produce chronic, acute, natural, and humoral diseases, each disease related to the cycles of a different set of parts (45). Many of the constituents of the human body, including major organs, the spirits running from heart and brain, and the humor known as *liquor vitae*, Paracelsus considers *entia* in their own right, that is, "free creatures." Their cycles inevitably produce diseases in the human body when they conflict with one another.

To protect the health of a patient, the physician must know from which of these sources a disease arises. For treatment he must take account of airs, the timing of remedies, the foods ingested, the disposition of mind, the effects of spirits, and the cycles within the body. In part, the prolongation

of life results from success in any of these endeavors because the physician then spares the patient from possible death. But there is still the matter of senescence, which Paracelsus recognizes.

The particular question remaining for Paracelsus is how a body made perfect grows old. He does not excuse old age as the purposeful design of nature. As most alchemists, such as Roger Bacon, he considers old age a defect of function and structure that anyone should try to prevent or cure (Waite II.109). He does not make allowances for the health relative to stages of life.

According to Paracelsus, old age is a disease and cannot help but be a disease if nothing contains the source of its own corruption. More particularly, the process of old age involves the *ens veneni* and represents the accumulation of *entia veneni* over time. These poisons accumulate because the alchemist naturally implanted in the body by God, the stomach, cannot consistently separate the *Essentia* ("that which sustains man") from the *Venenum* ("that which makes him ill") (*Paramirum* 29). The metaphor of the stomach as alchemist preceded Paracelsus, and in fact Roger Bacon had an ingenious explanation for old age that also depended on it, though with some difference. He proposed that old age, a condition of coldness, emerges as the stomach burns up the body's essential heat in the effort to separate nutrients from impurities. Thus, the alchemical physician can promote longevity by doing of the work for the stomach externally, separating purities and impurities in advance.[43] Paracelsus, however, views the source of old age as the build-up of the poisons themselves, that is, in the materials left over rather than in the loss of heat:

> [I]t may be inferred that youth and its powers do not fail on account of old age, but that these exist equally in the old as in the young. The corruption, however, which grows up with youth is so strengthened that it takes away the powers, whence old age is recognized. (Waite II.45)

This corruption seems to affect above all the *liquor vitae*, which Paracelsus calls "the life of the organs" (Waite II.44). The *liquor vitae* is also known as the "balm," and later Paracelsians often

[43] R. Bacon, *The Cure of Old Age*, 19.

think of it as an essence of salt, the middle of the three principles which enables life by serving as a substratum and bond to sulfur and mercury.[44]

Although the idea that senescence results in some fashion from a corruption of moistures is hackneyed by this point, the quotation above contains something remarkable: the force of life remains undiminished in old age. In most radical moisture theories, the native heat declines after middle age consequent to a loss of fuel. Paracelsus supposes that the power of the body remains just as strong in old age but is smothered over by superfluities. His portrayal disconnects the source of vitality from any bodily supply chain.

Every *ens* is essentially free. Freedom is a key concept in Paracelsus's ontology, maybe the key concept. Because God has made every *ens* perfect, in its reality it needs nothing else in order to maintain itself; only the matter it organizes needs replenishment while it freely endures. From the perspective of the body, life derives nourishment from the body, but from the perspective of whole made by body and spirit, life needs only the *ens*:

> Now, life derives its substance from the body. Consequently, the body must possess something which prevents it from being consumed by life, but, on the contrary, continues to exist. That is the thing concerning which we tell you is the *Ens*. It hails from the firmament. (*Paramirum* 19)

This passage appears in Book One of the *Paramirum*, on the *ens astrale*. The *ens astrale* represents the life-giving force of the universe, corresponding most closely to the Neostoical concept of cosmic *pneuma*. On earth, the *ens astrale* is contained within the air; it is, presumably, the aerial niter that Paracelsus mentions in other works and that gains paramount importance for later Paracelsians and chemists.[45] The air maintains life on earth just as the air of the firmament maintains the life of stars. After two other pneumatic cosmologies, the notion of air as vital force may also sound hackneyed,

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[44] See Bostocke, Ciii v; and Joseph Du Chesne, *The Practice of Chemical and Hermetical Physic*, trans. Thomas Tymme (London, 1605), K3 v- K4 r. In the *Lexicon Chymicum* (London, 1652), William Johnson defines balsam: "*Est salis interioris liquor suum a corruptione corpus tutissime praeservans naturaliter*" (38).

[45] See Allen Debus, "The Paracelsian Aeriel Niter," *Isis* 55 (1964): 43-61. The *ens astrale* may also be thought of as vital sulfur.

but here it seems not to be the case, as it was for Ficino or Fernel, or as it came to be even for later chemical philosophers, that the air feeds some vital heat. Rather, the *ens astrale* is itself the spiritual equivalent of vital heat. The body does not receive nourishment from the air; no vital heat or bodily spirit converts the air into itself. The *ens astrale* connects to the body via the air.

As spirit, the *ens* neither proceeds from the elements, nor can the elements touch it. Its freedom has a direct effect on Paracelsus's program for life extension:

> Marvel not that no mention is here made of temperaments, because the preservation of the whole body does not depend upon these, or upon their proportions, but rests on the virtue of Nature alone, from which all other excellencies arise. For the sole virtue is that which resuscitates and re-kindles the humors, which are four in number, but of which no account need be taken in medicine. The physician who bases his treatment on the natural temperaments may be fitly compared to a person who extinguishes a fire and leaves coals still burning. It is better worth considering how to preserve the root than the branches of a tree, because from the root the strength of the tree issues forth. (Waite II.111-2)

This is the kind of spiritual essentialism toward which Ficino's pneumatology leans but into which it never quite falls. For Paracelsus, life runs in an absolute line from spirit to "the gross and gloomy dwelling" that imprisons it (Waite II.3). He utterly refuses any notion of epigenesis, with the result that to counteract or erase the effects of old age a physician must amplify the vital power itself. The vital spirit is the root, the body the branches:

> A long life depends on three things: the vital spirit which conserves life in us all: after this rise the different temperaments and qualities, like the trunk and branches from a single root…If the vital spirit only be conserved, these vital humors are conserved also, and if these exist without any defect, no perverted elements, such as temperaments, can arise. So, by this method, the body, and all that is therein, is rendered sound and healthy. (Waite II.118)

Paracelsian hygiene reverses the direction of hygiene based on Aristotelian and Galenic principles, which demand that spirit or heat be maintained through the composition of elements. To affect vital spirit and, through vital spirit, the humors, Paracelsus recommends the use of herbal simples and *arcana* as well as a moderate diet. A moderate diet of the sort "well known to every physician" helps "to expel all the superfluities of humors which lie hid and grow in the body" although Paracelsus insists that the physician first separate the food's purities from its impurities

(Waite II.122). Additionally, some herbs such as daura contain an "essence" with the power of keeping people alive for 120 years, the implication being that the chemical physician must refine out that essence first. More potent still, certain "*arcana*," by which Paracelsus signifies chemically compounded metals, "fortify and nourish" the spirit even better than the best simples and thus support the body even longer. (How long is not said.) In a fashion typical of alchemical esotericism, Paracelsus hides the common names of these secrets and withholds recipes for the most powerful elixirs because they would be dangerous in the hands of wicked men.[46] The metallic *arcana* work by means of a "quintessence," which seems to be the same as the *ens*. In *The Archidoxies* Paracelsus defines quintessence as "a certain matter extracted from all things…a matter most subtly purged of all impurities and mortality, and separated from all the elements…a nature, a force, a virtue, and a medicine, once, indeed, shut up within things, but now free from any domicile and from all outward incorporation" (Waite II.22). The quintessence of metals surpasses that of living things, including that of herbs like daura, because living things are always mortal whereas metals possess permanence (Waite II.22, 114).[47] The *arcanum* of life, which Paracelsus at one point dubs the *Mercurius Vitae*, has the virtue of renovating persons and gold, like the traditional philosopher's stone (Waite II.43). Through it, something of the permanence of metals passes into the human body, where the essence of the *arcanum* mingles with the essence of the body (Waite II.115). Once inside, the quintessence of *Mercurius Vitae* separates out accumulated corruption and by augmenting the vigor of youth "renovates the period of life" (Waite II.44).

Paracelsus's writings suffer from all the obvious faults of which even appreciative scholars complain—abstruseness, disorganization, inconsistency, mystified credulity. Nonetheless, his theory of senescence and the therapy entailed by it comprise features later found in Francis Bacon's, which,

[46] See, for example, Waite II.119.

[47] For most alchemists, including Paracelsus, metals represent living yet permanent things. Perhaps as a consequence, those who view metals as living may differentiate animate from inanimate on the basis of procreation. We already have seen this in Ficino. A later Paracelsian, Joseph Du Chesne, follows the lead of Ficino, whom he cites. See his *The Practice of Chemical and Hermetical Physic*, N1 r – v.

as I try to show in the next Part, expose the roots of a modern biogerontology. His complex aetiology carves out a distinct place for old age as the cumulative effects of a certain kind of disease, the corruption and putrefaction of humors. His therapy certainly conceives of old age as something warranting treatment. Famously, too, his physiology begins by jettisoning much of the old knowledge and authorities in stated preference to observation and experience. Paracelsus even professes the productive cooperation of theory and practice whereby experiment dictates theories rather than the other way around. Supposedly, for instance, he derives his knowledge that "youth and its powers do not fail on account of old age" from the observable effects of the *Mercurius Vitae* on the body (Waite II.44).

The core difference, from which many other differences arise, is his idea of the immaterial, spiritual *ens*. All the vigor of body so often used to distinguish youth from old age is explained by a disembodied force active in matter. This *ens* possesses ontological uniqueness and can abide freely on its own without the body that, for some unstated reason, has imprisoned it. Paracelsus's chief concern is to preserve reality as something transcending matter. Perhaps, more modern, "scientific" explanations of life that cannot account for the teleological wholeness of each living thing that we as animals know by our own subjective experience of it fail in a different way, but Paracelsus's apotheosis of spirit obviates investigation of its ties to the body and induces a therapy for senescence heavily reliant upon magisterial cures. His chemical philosophy turns the gaze toward matter but ultimately in order to find the key that stands apart from matter. Religious devotion to spirit replaces the obsequious veneration of the ancients which he condemns, becoming for him a premise beyond question.

Paracelsus's dualism runs deep, and, in fact, because of it, his theory of senescence does not work as many other vital substance theories do when they depict the waning of power in old age as the direct consequence of the depletion of its material substrate. Instead, the vital thing remains as strong as ever; only a foulness builds up around it. In the end, however, this difference should not

obscure an equally profound similarity between Paracelsus's theory and radical moisture theories: both find something of ontological uniqueness at the basis of life. What differs is its location.

PART II

INTRODUCTION

Two questions that early modern writers asked about the prolongation of life—*Can it be done? Should it be done?*—Francis Bacon answers with a resounding "yes." Part Two tries to explain why he believed that the prolongation of life was possible and the means he endorsed for achieving it. Of course, as became clear in the previous part, any attempt to understand why the prolongation of life was thought possible in the early modern period (or is thought possible now, for that matter) supposes a particular definition of the prolongation of life. For Bacon, the prolongation of life carries a precise meaning; it is the extension of the lifespan itself through a direct remediation of the process of senescence. Like many alchemists and natural magicians of his day, Bacon was a prolongevitist. Unlike them, however, he proposed that life could be prolonged only with a new and thorough knowledge of how senescence happens. Senescence happens, according to Bacon, through the ingrained behaviors of and complicated interactions between small particles of matter. Knowledge of senescence requires, therefore, the further knowledge of how the smallest parts of matter are constructed and behave. Accordingly, I have divided Part Two into several chapters.

Chapter 3 covers what made Bacon's approach toward the prolongation of life historically innovative, what distinguishes his approach from that of his predecessors and contemporaries. It develops the argument that Bacon's unusual approach to the prolongation of life distinguishes him as something like a proto-biogerontologist, an exemplar of a science conventionally thought to have begun in the late nineteenth or early twentieth century. The next three chapters connect his provisional ideas concerning the invisible processes of human bodies and matter. Chapter 4 reconstructs his theory of senescence, which he scatters across several texts, including *The History of Life and Death*. Chapter 5 illustrates the principal techniques for prolonging life contained in *The*

History of Life and Death, most of which he grounds in his theory of senescence. Chapter 6 discusses the limit of life extension as Bacon foresaw it, or at least as much about that subject as we can infer from his statements on the natural history of longevity, and relates what his anticipatory thoughts about matter and its forms entail for the potential of a human immortality on earth. Together, Chapters 3 through 6 trace Bacon's own understanding that, if life is to be prolonged to its full extent, the limit will be achieved only with the help of the highest orders of science that plumb the inner workings of substances for the discovery of simple forms. What begins as a project of medicine must, because all branches of natural philosophy connect, derive its nourishment from other parts of learning closer to the roots. Chapter 7 builds upon the discussion of the previous chapters to reflect upon the question what "life" even meant for Bacon—a fundamental question to which eventually his metaphysic and his project of human life extension lead.

CHAPTER 3

BACON'S INNOVATION

When Bacon came to revise 1605 text of *The Advancement of Learning* for its Latin version, he made substantial alterations to the chapter dealing with medicine.[1] The most obvious change is the division of the science into three branches. The text of 1605 does not divide medicine at all, defining it simply as "the art of the cure." For Bacon at that time, medicine amounted to therapy, or the alleviation of disease. His restriction runs athwart the medieval paradigm stemming from Galen, who, in *De Sanitate Tuenda*, splits practical medicine into two branches, hygiene, or the prevention of disease, and therapeutics, or its remedy, a scheme reinforced by Avicenna's *Canon*, the most influential medical textbook of the Middle Ages.[2] Although at points Bacon's 1605 text implies that medicine includes the preservation of health, explicitly it limits the subject to the remedy of disease.[3]

When revising the text in 1623, however, Bacon does not adhere to the traditional program either. Sometimes, other medical writers of his day, aligning their compasses to Galen rather than to Avicenna, would divide practical medicine into three parts rather than two, a plan countenanced by

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[1] In the 1605 text, this is Chapter 10 of Book Two; in the 1623 text, it is Chapter Two of Book Four. For the text of *The Advancement of Learning* (1605) I have used the edition by G.W. Kitchin (reprinted, Philadelphia: Paul Dry Books, 2001). The text of *De Augmentis* is found in *The Works of Francis Bacon*, ed. James Spedding, Robert Ellis, and Douglas Denon Heath, 14 vols. (London: Longmans, 1857-74), hereafter abbreviated SEH. In the parenthetical citations of SEH, the first number refers to the Latin text, the second to the English translation.

[2] There was no immutable consensus about the branches of medicine among classical, medieval, and Renaissance medical texts. Generally, however, it was thought to consist of five parts, three theoretical (semeiology, physiology, and pathology) and two practical (hygiene and therapy). It is the practical side of medicine that is my concern here, for that was also Bacon's concern. Whether in the 1605 *Advancement* or in the 1623 *De Augmentis*, Bacon uses only practical categories; semeiology, physiology, and pathology do not warrant separate divisions. For a discussion of the shifting divisions of medicine, see Heikki Mikkeli, *Hygiene in the Early Modern Medical Tradition* (Helsinki: Academia Scientiarum Fennica, 1999), 32-40.

[3] In the 1605 *Advancement*, Bacon may be following either the Hippocratic author of *Peri Techne*, who appoints to medicine only the removal of distress and disease, or the Roman physician Celsus, who writes that medicine started as an art of curing disease and only later adopted hygienic measures, a passage to which Bacon refers elsewhere.

Galen's *To Thrasyboulos*; for instance, the Welsh physician John Jones in his *A Briefe, Excellent, and Profitable Discourse* (1574) separates the offices of medicine under the Greek headings *Prophilacticke, Euecticke,* and *Analepticke*.[4] In *De Dignitate et Augmentis Scientiarum,* however, while Bacon divides medicine three ways, fitting most passages from the 1605 edition under the first two branches, "preservation of health" and "cure of diseases," he offers as the third branch of medicine something usually taken to be either the purpose or side-effect of preserving and restoring health, the prolongation of life. It is when appraising the status of this third branch that Bacon adds most of his new material. The several new paragraphs largely adumbrate passages in *The History of Life and Death,* a work also published in 1623 and devoted to the prolongation of life. This third branch, which Bacon neither mentions nor implies in 1605, is now medicine's "principal part." Bacon makes a more astounding claim when he says that no one else before him has noticed its importance to medicine. As he declares, "I am the first to bring [the prolongation of life] within the office and function of art" (SEH I.591, IV.383).

This last remark by Bacon should discomfit anyone who has read a health manual from the period. Ostensibly, Bacon was not the first to situate the prolongation of life within the office and function of medicine. Take as examples two writers whom Bacon cites in *The History of Life and Death*, Marsilio Ficino and Luigi Cornaro. Ficino's *Three Books on Life* (1489) has the expressed intent of prolonging the lives of scholars, poets, and philosophers. In *La Vita Sobria* (1559), Cornaro repeatedly assures readers that they can lengthen their lives if they restrict their diet and follow other temperate habits. Bacon surely knew about those claims and perhaps, too, about the array of other medical writers whom he does not mention but who also spoke candidly about prolonging life. For instance, the French physician Laurent Joubert poses as the second question of his *Popular Errors*

[4] John Jones, *A Briefe, Excellent, and profitable Discourse, of the naturall beginning of all growing and living things, heate, generation, effects of the spirits, government, use and abuse of Phisicke, preservation, etc*. (London, 1574), Gi r. Although Jones cites *To Thrasyboulos* here, he does not use the exact same terms as Galen. In *To Thrasyboulos*, Galen divides medicine into two parts, preservation [*phylaxis*] and healing [*therapeia*], but countenances the possibility of a third, prevention [*prophylaxis*]. See *Selected Works*, trans. P.N. Singer (Oxford: Oxford University Press, 1997), 80-83.

(1578), "Whether it is possible to prolong man's life through medicine." He argues that it is. So did physicians and hygienists such as Jones, Thomas Moffett, Levinus Lemnius, William Vaughan, and Leonardus Lessius. As discussed in my introduction, early modern medical writers frequently raised the question whether it was possible to prolong life. Although many thought that it was not possible, many others asserted that it was—in fact, that increased longevity was one of the principal benefits of medicine. John Jones cites Hippocrates, Galen, and Celsus as proving that physic "conserveth health, mendeth the decayed, and prolongeth life."[5] Indeed, if one takes the term prophylaxis to mean the prolongation of life, as historian Guido Giglioni has, the tripartite taxonomy by Jones, which I gave earlier, includes the same three branches used by Bacon in *De Dignitate et Augmentis Scientiarum* (1623): preservation of health, remedy of disease, and the prolongation of life.[6]

Why would Bacon claim to be the first to subsume the prolongation of life under art when, for years, physicians and hygienists had been claiming that office for medicine? The answer seems to be that, in a fashion commensurate with his avowal to call new ideas by old names, he does not mean quite the same thing by "the prolongation of life" that many of his contemporaries and predecessors did. In 1623, Bacon announces that physicians have confounded the prolongation of life with the other two branches of medicine, the preservation of health and the cure of disease. The confusion has resulted for a simple reason:

> [Physicians] imagine that if diseases be repelled before they attack the body, and cured after they have attacked it, prolongation of life necessarily follows. But though there is no doubt of this, yet they have not penetration to see that these two offices pertain only to diseases, and such prolongation of life as is intercepted and cut short by them. (SEH I.590, IV.383)

Bacon here is attacking an opinion then prevailing among physicians that medicine serves to prolong life by preventing and curing diseases that otherwise might foreshorten it. Moffett's *Healths*

[5] Jones, *Discourse*, G iv.

[6] See Guido Giglioni, "The Hidden Life of Matter: Techniques for Prolonging Life in the Writings of Francis Bacon" in *Francis Bacon and the Refiguring of Early Modern Thought*, ed. Julie Robin Solomon and Catherine Gimelli Martin (Burlington, VT: Ashgate, 2005), 134. I do not endorse Giglioni's interpretation of "prophylaxis."

Improvement, which was written and circulated probably as early as the 1580s even though not printed till 1655, aptly abbreviates the received wisdom:

> But some men will further object against me, What sir? May diet prolong a man's life? Why then through diet we may prove immortal, or at least live as long as Adam did. Whereunto I answer, that albeit immortality is denied upon the earth to mortal men, yet so much life is prolonged by good diet, by how much diseases are thereby eschewed.[7]

Moffett's imaginary debate evinces a conceptual problem posed by the corrective effect of human art upon human life, a problem as much active then as now. The prolongation of life can refer either to time added against the natural processes of age and decay, as Moffett's fictional interlocutor would have it, or to the time saved from illnesses that would foreshorten life, as Moffett himself proclaims.

Bacon clearly conceives of the prolongation of life in the first way. He seeks to add length to human life, not just to postpone death by disease. His argument is that traditionally physicians have not differentiated prolongation against the interception of disease (or by diseases "eschewed," in Moffett's words) from prolongation against the interception of senescence and natural death. Thus he proposes to include under the topic of medicine "the lengthening of the thread of life itself [*filum ipsum vitae producere*], and the postponement for a time of that death which gradually steals on by natural dissolution and the decay of age" (SEH I.590-1, IV.383).

In today's parlance, Bacon was a "prolongevist."[8] He sought less the increase of life expectancy than an increase of lifespan, that is, the lengthening of the thread of life itself. For Bacon, this amounts to attempting to eschew and cure "natural dissolution," the decay brought on by age. Old age is to be treated like a disease, an object of prophylaxis and therapeutics. By those means, the human lifespan can be stretched to Old Testament proportions. In *The History of Life and Death*

[7] Thomas Moffett, *Healthes Improvement* (London, 1655), 4.

[8] For more on this word, see the Introduction.

(1623), Bacon sets as benchmarks the lives of superlongevous patriarchs like Methuselah, who lived 969 years.[9]

Using an uncommon definition for the prolongation of life, Bacon's boast to introduce it into medicine would appear to mean that he is the first to propose that medicine has the duty to extend human life far beyond its supposedly natural bounds, not just beyond the bounds accidentally collapsed upon it by diseases. In fact, scholars have tended to interpret his dissent from the dominant view in just that way. Most recently, Guido Giglioni has observed that Bacon breaks from classical tradition when he "dismisses as a form of theoretical and practical idleness the ancients' belief in the existence of insurmountable limits in extending the length of human life."[10]

Such a reading poses a problem, however. It assumes that Bacon counterpoised himself strictly against the Galenic tradition of medicine. True, that tradition predominated in early modern Europe, and, like Galen, early modern physicians most often apologized for aging as a necessity of nature to which one must accord as best one can. Thus, Bacon's opinion that senescence was tractable militated against the dominant view that every human body must decline in roughly the same way and at roughly the same pace. Nevertheless, the effort to prevent and remedy old age was not new with Bacon. As seen in the previous chapter, alchemists, natural magicians, Paracelsians, and any number of physicians inspired by their ideas thought that senescence could be halted or reversed with the use of an elixir, an astral sympathy, or a quintessence. What is more, Bacon includes such thinkers within the profession of medicine. In *De Augmentis* as well as in *The History of Life and Death*, he engages chemical and magical physic although, with regard to the prolongation of life, he balks at the lofty promises and wayward remedies of both and cautions readers to beware magical potions and "precious" medicines (OFB XII.240-1). He alludes to Paracelsians and other

[9] For the text of *The History of Life and Death*, I have used *The Oxford Francis Bacon*, vol. XII, ed. Graham Rees (Oxford: Oxford University Press, 2007). The series is hereafter abbreviated OFB.

[10] Giglioni, 141. Giglioni goes on to argue that Bacon's "unlimited prospects" for art's conquest of aging necessitated a "drastic redefinition of the meaning of the natural order of life." I address Giglioni's analysis again in the final chapter of this section.

alchemists when he questions the efficacy of supposedly life-giving properties of metallic cordials like potable gold and the spirits of salt (OFB XII.232-7).[11] The blood baths that he finds morally repugnant infiltrate the works of Ficino, whom he cites, and Roger Bacon, whom he does not (OFB XII.320-1). All such treatments aim at delaying or reversing senescence and thereby advancing human lives beyond the limits attainable by Galenic hygiene and a regimen of simples. Bacon's ranking them as medicine may offend modern sensibilities adjusted to the sharp contrast between valid science and superstitious magic; however, his positioning reflects the conditions of the sciences of his time better than our own does. Not only Ficino, but other physicians carrying the imprimaturs of medical colleges, such as Girolamo Cardano, Andrew Boorde, and John Securis, testified to the value of what we no doubt would consider magical remedies. Furthermore, at least two early modern medical writers who represented Galenic physic but doubted the use of elixirs and astrological figures nevertheless approved medicine's ability to increase the lifespan. In *Popular Errors*, Joubert argues that by deeply moistening spermatic parts medicine can not only preserve life but prolong it. Cornaro, whose restrictive diet differs from Galenic hygiene more in degree than in kind, repeatedly assures his readers that if someone of his own frail constitution can reach eighty, ninety, or one hundred years of age by use of his severe diet, people of even average constitutions can live even longer by it.

In the light of this evidence, we should not readily consent that Bacon was the first to fit radical life extension into the art of medicine. Secondly, given Bacon's own references to the efforts of alchemists, Ficino, Paracelsus, and Cornaro before him, he also must have known that he was not. Thus, his remark that nevertheless he was merits greater consideration. Why would Bacon claim to be the first to place the prolongation of life under the art of medicine when he knew that predecessors had thought to use medicine to extend the lifespan?

[11] Both Ellis and Rees note that Bacon's likely source for this passage is the *Antidotarium* (Basle, 1588) by Johannes Wecker, a Swiss physician and alchemist.

The answer appears to have something to do with the word "art." Just as Bacon affixes a novel meaning to the prolongation of life, he also restricts the meaning of "art." In *The Advancement of Learning* and *De Augmentis*, each art discussed has a distinct object of study. Bacon classifies each by cleaving knowledge where the objects of knowledge themselves cleave. For instance, the whole of human learning first splits according to the faculties of human understanding—memory, imagination, and reason—revealing three respective subjects, history, poesy, and philosophy (II.i.1). A different branch of learning indicates a different object or end. Medicine constitutes one of several arts directed toward the good of the human body but is distinguished from the rest by the kind of good it seeks, the good of health as opposed to the goods of beauty, strength, and pleasure. Within medicine (according to *De Augmentis*, not to *The Advancement*), one office pertains to the preservation of health against sickness and another to the restoration of health after sickness. The third, the prolongation of life, pertains to natural dissolution, a term Bacon substitutes for "age," the vagueness of which solicits a warning from him elsewhere (OFB XII.164-5).

Bacon's declaration to be the first "to bring the prolongation of life within the function and office of art" suggests that he is the first to propose that senescence itself is not understood. In the original Latin, Bacon writes, "…*in artis officium et munus jam primum a nobis revocaretur*." Ellis's translation loses the sense of *revocaretur*. Bacon purports to call the prolongation of life back to medicine. In the light of his glosses "Prometheus" and "Orpheus" in *De Sapientia Veterum* (1609), the verb suggests that he is restoring to medicine a task that its most ancient form recognized but that it has since lost. According to Bacon, the branch of medicine directed toward the prolongation of life must seek to understand what natural dissolution is, which in his practical mode of investigation amounts to understanding how it works. Knowledge of senescence will improve with practical accomplishments that ameliorate senescence. First, however, medicine must recognize that senescence is a phenomenon separate from disease and health. As such, it warrants its own discipline of study. The lack of a definite article in Latin makes possible two different renderings of the noun *artis*, either "art or "the art." Bacon's concern to isolate natural dissolution as an object of study

encourages both readings at once. The prolongation of life is to be *an* art fitted within *the* art of medicine. As an art, its success can be measured by trial and experiment. Once capable of growth, it may assume a place within the art of medicine, which it will renew and fulfill.

At least part of Bacon's declaration to be the first to fit the prolongation of life under the medical art is justified. Justified is his indirect claim that those before him did not treat senescence as an object of discovery and that he, by turn, does. Harder to justify is his claim that the inclusion of the prolongation of life will transform the art of medicine. This second claim is harder to justify, because, for the next two centuries, medicine paid little heed to the buccinator's reveille; instead, it progressed as an art while continuing to envision the prolongation of life as conquest of emergent disease. My focus for the next few chapters is, therefore, Bacon's treatment of senescence as an object of discovery. What justifies his claim to inaugurate this aspect of the medical is, in part, the theoretical basis that prolongevists—alchemists, natural magicians, and the iatrochemist Paracelsus—who preceded him shared with Galenic apologists, who tended to deny the possibility and goodness of subverting natural decay. The prolongevists preceding Bacon based their effort on principles derived from Aristotelian and pseudo-Aristotelian texts of natural philosophy. Those principles lead them to believe that, however hard they struggled to find the best means by which to counteract senescence, they largely understood how it happened.[12] Among Galenic medical writers, the dominant theory involved primigenial or radical moisture; like fuel to a wick, this secondary humor burned up over the course of a lifetime, inducing old age and death. However, alchemists, natural magicians such as Ficino, and even Paracelsus subscribed to the same or similar theory; they agreed with the Galenists that aging and senescence resulted from a slow depletion of a vital substance—if

[12] Giglioni makes a similar point. Speaking of Bacon's self-differentiation from alchemists who also tried to control longevity artificially, he writes: "Such operative faith in artificial ways of prolonging life and such emphasis on the possibility of acting concretely and effectively on the course of human existence are the components that seem to be missing in the previous attempts" (140). Although essentially I agree with what Giglioni says here, I am trying to put more emphasis on the point than he does. Giglioni does not acknowledge that anchoring Bacon's optimism was the belief that senescence was universally misconstrued, whether by Galenic apologists or prolongevists. Furthermore, he oversimplifies the theory of senescence that Bacon derives.

not radical moisture, then *pneuma* or both. Although they debated and struggled to attain sound remedies, they did not doubt how the remedies would work: by preserving the fuel of life's fire. The most ambitious of early modern prolongevists, alchemists, devoted their efforts to learning the secrets of manufacturing the *elixir vitae*, but meanwhile they presumed why, if ever attained, the elixir would succeed—because it would restore and protect the body's vital principle. According to the historian Harry J. Sheppard, the core concept uniting the three alchemical objects of chrysopoesis, human life extension, and spiritual redemption was "control over time," which entailed the acceleration of three processes: the perfection of metals into gold, the perfection of the human body into immortality, and the perfection of human knowledge into gnosis.[13] As Sherwood Taylor pointed out long ago, the notion that all matter strives to perfect itself rested upon a tenet of natural philosophy dating back to the pseudo-Aristotelian *Metrologcia*. All matter was suffused with a breath from heaven. In metals this *pneuma* worked to produce gold out of more impure materials. In living things it struggled to maintain life against destructive forces.[14] Within living things, the vital breath was nurtured by radical moisture, a substance that, according to Albertus Magnus and others, was also responsible for the cohesion of non-living things. Living things aged as the warm, ethereal breath, often identified or strongly associated with native heat, burned away the radical moisture. Even so vitriolic an opponent of received medicine as Paracelsus took for granted that the human body is preserved by a dewy balm. His assaults upon the doctrine of humors pertained more to practice than to theory and left the secondary humor intact.

Because Galenist medicine taught that radical moisture could not be restored perfectly, physicians who abided by radical moisture theory deduced that decay and death were inevitable no matter what art did, and therefore they tended to concentrate on what they thought they could control,

[13] Harry J. Sheppard, "European Alchemy in the Context of a Universal Definition" in *Die Alchimie in der europaischen Kultur-und Wissenschaftsgeschichte*, ed. Christoph Meinel (Wiesbaden: Otto Harrasowitz, 1986), 16.

[14] Sherwood Taylor, *The Alchemists* (New York: Henry Schumann, 1949; reprint, New York: Barnes and Noble, 1992), 18-21.

health, limiting their redress of old age to the measures of hygiene and therapy. For them, the belief in the absolute necessity of natural dissolution precluded analysis of old age beyond what familiar regimens effected. As I have tried to explain, prolongevists before Bacon did little more. Many overturned or diluted the belief that natural dissolution is necessary and hoped to extend life beyond familiar limits. Nevertheless, because they subscribed to the same postulate of diminution of vital substances, they assumed that they already knew how aging worked and turned their attention instead to learning, practicing, and disseminating the arts that promised to re-invigorate the body, ultimately through restoration of vital *pneuma* and native heat.

Bacon differs from all those other thinkers by supposing that the model of aging they used remains open to question. How senescence happens has not been decided, Bacon argues. However it happens, the traditional explanation is wrong. Thus, *The History of Life and Death* begins with an incisive repudiation of the usual answer. The facts cannot support radical moisture theory. Furthermore, that theory is so compendious as to be impractical: it collapses all differences between youth and age into a single source while its posture of authority blunts the acuity of physicians (OFB XII.342-3). Bacon reasons that only with radical moisture theory out of the way can medicine concentrate on discovering the true causes of senescence. *The History of Life and Death* provides a new theory about how natural dissolution happens. The new theory is largely provisional although Bacon expresses great confidence in some of its most basics principles; future experiments will refine the rest.

Another way of stating Bacon's innovation is that he introduced biogerontology. Biogerontology, or the biology of aging, is commonly thought to have begun only in the late nineteenth or early twentieth centuries with the likes of August Weismann and Elie Metchnikoff, who themselves drew up strange and now-outmoded theories of senescence. Instead, biogerontology seems to have emerged at the inception of modern experimental science itself, with Bacon's instauration of learning. Required to achieve the highest practical aim of natural philosophy, Bacon's theory of natural dissolution is paramount to his program of sciences, whose very name, *Instauratio*

Magna, connects it to bodily renewal. For Bacon, the prolongation of life not only instantiates the greatest charity to be bestowed on humanity, it legitimates the new learning itself, for only the discovery of nature's deepest recesses can achieve it. A new biogerontology is a necessary step on the way to natural science's highest practical aim.

What makes Bacon's innovation possible is the shift from the substance of the body that is repaired to the means of repair. According to Bacon, senescence originates with a degenerative process affecting all matter, not just living bodies. My next chapter details Bacon's remarkable theory of senescence. It purposes to defend the following claim: although Bacon's theory owes much to the medical tradition it inherently critiques, it still obviates the notion of a vital substance. This claim runs counter to the opinion of certain scholars who would have it that Bacon's theory is almost entirely derivative. The scholar whom I have foremost in mind is Gerald Gruman. His book *A History of Ideas about the Prolongation of Life* is the only study of its kind. Deservedly, it has had a wide influence on historians of the life sciences, for it maintains the delicate balance between careful analysis and expansive scope remarkably well. Unfortunately, it also misrepresents Bacon's theory of senescence. In Gruman's words, Bacon's theory is "largely derivative" and "based on vitalism and humoralism." Additionally, in spite of vituperations against convention, Bacon posits, according to Gruman, the same tired ideas under new names, replacing the concepts of innate heat and innate moisture with spirits. Ultimately, Bacon offers "nothing very new either in theory or practice."[15]

In the analysis that follows I try to account for Bacon's many borrowing and the derivative assumptions with which he works. Nonetheless, his deferrals to prevailing ideas should not blind us to some truly unusual aspects in his theory of senescence. Above all, we need to see that Bacon's theory of senescence is not a vital substance theory. A vital substance theory explains senescence as a direct and proportional result of the decrease of a substance necessary for life and strength. In a

[15] Gruman, 142.

way, Bacon's spirits—or at least one variety of them—are a vital substance, but only because life requires their presence and death requires their loss. They do not, by themselves, explain the long decline toward death, as though old age advances in indirect proportion to their dwindling. Rather than a life force infusing vitality to all it touches, vital spirit is a material body with the correct structure and tenuity to produce the degree of heat needed to stimulate and maintain the functions that we regularly recognize in living things. Vital spirit plays an important role in Bacon's theory of natural dissolution, but natural dissolution happens as a result of a complex of forces both inside and outside the body. Vital spirit is but one physical force; it is not a metaphysical genius or an independent minimum of life.

Rather, as I hope my analysis will evince, Bacon's biogerontology (if we can call it that) rests upon an unusual and anticipatory theory of matter that locates natural decay not in the consumption of a vital substance but in a complex process underwritten by the tendency of all compound bodies, not just living ones, to break down. Its trigger is the inanimate process of consumption and desiccation. In Bacon's theory current biogerontologists might recognize elements of two broad categories of contemporary aging theories. One includes the so-called wear-and-tear theories of aging. Summarized by Harry Moody, wear-and-tear theories begin with the simple observation that "the organic process of life is a delicate balance between forces that wear down structures…and those that repair damage." Old age results when the balance shifts: damage randomly accumulates faster than the body can repair it, largely because the means of repair suffer damage, too.[16] The resemblance between such theories and Bacon's is striking. In *The History of Life and Death* Bacon views the human body as both an inanimate and an animate thing. Like all inanimate things, it randomly suffers damage from its environment, but unlike those, it can repair itself. Old age advances when the means of repair break down.

[16] Harry R. Moody, *Aging: Concepts and Controversies*, 5th ed. (Thousand Oaks, CA: Sage Publications, 2006), 18-19, 31-32. For more on contemporary theories of aging, see Leonard Hayflick, *How and Why We Age* (New York: Ballantine Books, 1994) and Tom Kirkwood, *The Time of Our Lives* (New York: Oxford University Press, 1999).

Current biogerontologists also might hear prophetic echoes of less random, more linear theories of aging that root senescence in a few internal mechanisms, such as hormones or genes. When Bacon speaks of the vital spirit as a cog in a machine which, if it could be turned backwards, could reverse the process of aging, he verges close to such a theory.

As I hope my analysis will demonstrate, Bacon's ideas about of senescence fit into both categories and neither. They do not fit easily into the categories used by biogerontologists today, because they fuse the concept of systemic and microscopic decomposition with the paradoxical assurance that medicine can control the breakdown of advanced age. Wear-and-tear theories cast doubt on the capabilities of medicine to counteract senescence, for they entail a multiplicity of causes for senescence: old age happens when the smallest parts of the body's machinery wear down independently of one another, and curbing the damage of age becomes difficult when it occurs in an almost infinite number of places at once and for diverse reasons. On the other hand, more linear theories can instill the hope that medicine will one day succeed in slowing or reversing senescence. The notion of a key that turns senescence on or off makes the job of controlling senescence look somewhat simpler. If only one can learn how to work the key, one can control the rate of old age.

Remarkably, Bacon shares both the tendency to analyze senescence as a complication of forces and the tendency to seek out the most compendious (but not too compendious) means by which to arrest and reverse senescence. Although he disparages radical moisture theory as reductive and solitary nostrums as shams, he holds out nearly unlimited optimism for the possibility of art to conquer age. Those dueling tendencies make Bacon's theory difficult to classify according to the standard divisions of today's biogerontology. They also have profound consequences for his practicum. The details of his biogerontology necessitate the redress of natural dissolution by multiple and opposed remedies that can maintain the balance of particulate forces even when a patient is not ostensibly sick. Meanwhile, his eagerness to treat the complex process of senescence leads to an epistemological predicament: the remedies that Bacon promotes may not be able to test the theories that gave rise to them. But these last points are topics for Chapter 4.

CHAPTER 4

BACON'S THEORY OF SENESCENCE

Section (a): Introduction

Bacon's theory of senescence appears principally in *The History of Life and Death*, his most elaborate work on the topic; *De Augmentis* II.4, which, for the most part, condenses what *The History of Life and Death* says; and *De Viis Mortis*, a manuscript written during the decade prior to those texts and offering many of the same ideas in an even less coherent form. In this chapter, I shall confine discussion mostly to the theories as they appear in *The History of Life and Death*, but occasionally I have recourse to the other texts when something Bacon says in them differs markedly from what he says in the larger and more polished work. Because Bacon's theory of natural dissolution involves the operations of tangible and pneumatic bodies, in this part I also find it necessary at times to search other texts for what they reveal about his thoughts concerning invisible processes and parts connected to aging. Those texts are primarily the published books *De Sapientia Veterum* (1609) and *Novum Organum* (1620) along with the manuscripts *Cogitationes De Natura Rerum* and *De Principiis atque Orginibus* written during the years between the two books.[1]

Because the present chapter deals extensively with *The History of Life and Death*, it would be helpful to begin with a short synopsis of that book. Later portions of my analysis use parts of the book as points of reference.

The stated purpose of *The History of Life and Death* is to introduce the prolongation of life to medicine so that physicians will begin to carry out the highest task set before them by God. As a

[1] When possible, I have used *The Oxford Francis Bacon* for all of these texts. For the translation of the *Novum Organum*, however, I have used that of Peter Urbach and John Gibson (Chicago: Open Court Publishing, 1994); citations for the *NO* give book and aphorism numbers.

natural history, though, the book also investigates the phenomenon of natural dissolution. It thus offers a theory of natural dissolution and the remedies by which to control it. Bacon's investigation proceeds inductively, using natural and artificial "experiments" of animate and inanimate objects in order to discover the operations of the human body that determine the rate of its dissolution. Following a Salutation and Preface, Bacon lists sixteen topics of inquiry. His ensuing investigation treats the inquiries more or less sequentially. Below is an outline of the inquiries:

1. Duration of inanimate bodies and vegetables
2. Desiccation
3. Duration of animals
4. Alimentation
5-9. Duration of humans, according to five factors:
    (5) Historical and geographical situations
    (6) Natural constitutions
    (7) Hours, days, and months of birth
    (8) Diets and hygiene
    (9) Studies and affections
10. Medicines
11. Prognostics for long or short life
12-14. Remedies for natural dissolution
15. Approaches of death in the moments just prior to death
16. Differences in faculties and physical conditions of youth and age

The book concludes with thirty-two *Canones Mobiles*, or "Provisional Canons." The Canons draw from the preceding inquiries and from some of Bacon's other investigations into nature not contained in *The History of Life and Death*.

The twelfth through fourteenth inquiries, in which Bacon offers his remedies, are called the three *Intentiones*. The word "intention" carries a medical sense, as Graham Rees, the most recent editor and translator of *The History of Life and Death*, has noted.[2] The three intentions are to prevent consumption, to improve alimentation, and to renew the parts. Each of the three comprises multiple "*Operationes*" used to effect it. These operations are Bacon's prescriptions for extending longevity; they constitute approximately forty percent of the whole book.

[2] See OFB XII.liv.

The large amount of practical advice means that *The History of Life and Death* does not fit the ideal model of natural histories that Bacon envisions for his great instauration. The ideal sort of natural history that Bacon outlines in the *Parasceve* should offer much more evidence before unfolding this number of benefices. Ideally, the natural histories are to provide the raw material by which natural philosophers can extrapolate higher theoretical axioms on the way to discovering simple (versus complex) "Forms," the object of Baconian metaphysic, the highest branch of natural science. Forms represent the fundamental differences between things determined by the structures and activities of the minimal parts of matter. A list of Forms given in *De Augmentis* includes the pair "animate and inanimate." If *The History of Life and Death* is to lay a groundwork for those Forms, one might expect it to encompass studies of the different kinds of living things, of the origins of life out of inanimate matter, and of the various ways death occurs.[3] With its heavy emphasis on a medical practicum, however, the book neglects much that one might expect an investigation of the phenomena of life and death to cover. It gives scant attention to the life's emergence and increase, instead concentrating on death. More narrowly still, it concentrates on only one kind of death, natural dissolution, purposefully excluding deaths by violence and disease in spite of its general title.[4] In these ways, it diffuses analysis of the operative differences between life and death and between animate and inanimate things. Unlike the *Novum Organum*, which tenders a provisional definition of heat, *The History of Life and Death* never states in a clear sentence or two what makes a living thing alive or a dead thing inanimate.

The phenomenon it works most assiduously to define is natural dissolution. In all his lists of Forms, either simple or complex, Bacon never includes natural dissolution or age. But if he believed

[3] Life and death may not signify the same things as animate and inanimate, of course, a point that I develop in Chapter 7. The *Parasceve* lists a History of Life and Death apart from several other histories related to topics that Bacon also covers in the book, such as aging, longevity, growth, and nutrition.

[4] The exception is the article titled "Death's Anterooms," which does address other modes of death, however briefly.

that it also has a Form in the extraordinary sense he intended that term, *The History of Life and Death* presents his self-consciously provisional approach toward defining it.

The weight given to practical nostrums should not cause us to underestimate the importance of theory to the book. The most obvious theory, of natural dissolution as a whole, rests upon many others regarding the inner workings of matter. As much text as the operations for prolonging life command, the book reserves much to speculation, too. An important question for readers is how the speculative and practical sides relate. As I try to demonstrate in this chapter, Bacon grounds some of his most important and most unusual prescriptions on the principles of matter underwriting natural dissolution. The bigger question is what the prescriptions mean for the theories. As Bacon says, experience will have to confirm or deny the various components of his axioms and observations. Even the tenets about which he seems most confident—for example, that all matter contains spirits within it—he groups under the "moveable" Canons. The book relates not only to medicine but also to physics at large and also to metaphysics as well as to the operative counterparts of those studies, mechanics and natural magic. The discovery of natural dissolution, which improves with the ability to prolong life, requires the investigation of the processes hidden within the decomposition of matter. But does the success or failure of Bacon's prescriptions confirm or deny his axioms and observations, or do they confirm or deny only their own utility for prolonging life? On the one hand, Bacon explains many of his treatments in terms of his matter theory, and he speaks as though he understands the mechanics of senescence well enough to redress it. On the other hand, he confesses to use many remedies already in practice, and he avows no more than that they will do no harm.

Section (b): Bacon and the theory of radical moisture

To demonstrate that Bacon's biogerontology does not adhere to a theory of vital substance, especially of radical moisture and native heat, it is necessary to show that his theory of senescence avoids the supposition of a material basic to animal bodies, the gradual diminution of which induces a weakening of the body's powers and the loss of which makes the continuance of life impossible.

That is the main point of this chapter. We should begin by looking at how Bacon challenges the predominant vital substance theory of his time, the theory of radical, or primigenial, moisture and native heat.

As we saw in Chapters 1 and 2, the dominant theory of vitality found in the Renaissance, the theory of life based upon radical moisture and native heat, cast radical moisture in the role of fuel and native heat in the role of flame. In the proverbial metaphor, life was a lamp. One aged, and vital faculties declined, because the heat or flame of life gradually consumed the oily, glutinous moisture of the body upon which that heat in turn depended. In other words, the innate heat consumed its own fuel. The intake of food could not compensate wholly for the loss of fuel; the radical moisture was too pure, too refined, or just too specific to be replicated totally by the digestion of food into nutriment. Thus, life moved through a vicious cycle. Typically, the innate heat was taken to be either the same thing as or an intimate partner of the body's so-called medical spirits, ultra-fine vapors emanating from the blood that were responsible for the body's nutritive, motive, and sensitive faculties. Sometimes those spirits were also associated with the vital breath of heaven, cosmic *pneuma*. Directly or indirectly, the spirits consumed the radical moisture. They did so even when consumptive diseases or sexual activity did not. Without a consistent supply of fuel, it was believed, the medical spirits could not adequately perform their functions, including digestion. Poorer quality digestion resulted in poorer quality blood and hence poorer quality spirits, and the poorer quality spirits diminished digestion once again, resulting in spirits of even lower quality, and so on. Eventually the spirits could not maintain the functions most necessary to life, and death ensued.

The important thing to note in such accounts of aging that Bacon knew is that senescence and natural death result directly and necessarily from the depletion of a single, life-giving substance that is eroded by the activities of life itself. Life undermines its own source, as flame does. The analogy to flame may look like a superficial comparison, but in the Renaissance and previous centuries the comparison had explanatory power. Most often, writers noted a correspondence on two points. First, both flame and life give off heat. Second, the dissolution of each seems to be necessitated by its own

proper activity; flame is destroyed by virtue of its burning, and a living thing is destroyed by virtue of its living. Used scientifically, the comparison to flame entails further consequences for life. Above all is the surmise of an inexorably defective fuel. Flame is destroyed only if no more fuel is added. According to the logic of the analogy, if flame requires a fuel, life must require a fuel. Apparently in the case of life, however, the fuel cannot be restocked. Although we eat, we still die. Here reason fills in the gaps. What we eat is not converted adequately into the fuel needed for life. Instead, there must be some unique *pabulum* that gradually declines in amount and quality despite our attempts to restore it.

When Bacon rejects the theory of radical moisture, he still deploys the comparison between flame and life; however, he finds fault with the deduction commonly resulting in a defective pabulum. Before he challenges the theory in the Preface to *The History of Life and Death*, he sums it up with the following account:

> Anything which can be repaired gradually, without destroying the original whole, is, like the vestal flame, potentially eternal. When therefore the physicians and philosophers saw that animals were fed and that their bodies were repaired and refreshed, and that this happened only for a while, and that not long after they began to grow old, and were promptly dragged to their destruction, these same physicians sought the cause of death in something that could not be properly repaired, supposing that some radical and primigenial moisture could not be thoroughly repaired, but even from childhood [*iam usque ab Infantia*] took on a kind of defective apposition [*Appositionem quondam degenerem*] instead of due repair, and with time grew worse and eventually reduced a bad condition to nothing at all. (OFB XII.146-7)[5]

Bacon accepts the first sentence ("Anything which can be repaired gradually, without destroying the original whole, is, like the vestal flame, potentially eternal"), but the rest of the theory he goes on to ridicule as "ignorant and light-minded enough." The analogy between flame and life, from which it begins, does not bother him; in fact, he finds the analogy useful. What bothers him is the interpretation generally put to the analogy, which introduces an unnecessary point of contrast that experience overwhelmingly contradicts. Radical moisture theory assumes that the decline of life's

[5] Bacon's preferred term for the secondary humor at the basis of life, primigenial moisture, may indicate Jean Fernel as Bacon's source. Fernel used the term widely. He also dealt with some of the same problems that Bacon addresses here, offering solutions that Bacon ignores.

fuel results from the native inability of radical moisture to be repaired wholly. Instead of whole repair, the theory proposes that radical moisture undergoes what Bacon calls "defective apposition," the reason life is not like a vestal flame after all. As this passage begins to demonstrate, Bacon finds experience contradicting the idea of defective apposition, which necessarily starts at birth. What ultimately belies the whole radical moisture theory, as Bacon immediately explains, is the plain fact that animals grow before they decline: "For in animals all things are completely repaired while they are growing up and still youthful [*sub Adolescentia, & Iuuentute*]; indeed for a time they increase in size and improve in quality [*Quantitate augentur, Qualitate meliorantur*], so that the matter of repair could be practically everlasting, if the means of repair [*Modus Reparationis*] did not break down" (OFB XII.146-7). The repair of life's fuel is not naturally defective, because for some time after birth animals grow. Therefore, they must have some way of repairing themselves fully, or better than fully, because growth requires more than merely repair of what has been lost.

Although the density of Bacon's expression may obscure his reasoning here, the juxtaposition of the theory with its rebuttal reveals two key disagreements. First, the old theory holds that corruption sets in "even in childhood" or infancy, whereas experience teaches that the bodies of animals actually enlarge and improve after infancy, during adolescence and youth. Second, the old theory locates the source of bodily decline in the radical moisture itself, whereas Bacon locates it in the "means of repair." Bacon's second disagreement follows as a conclusion from the first. If, as the old theory supposes, natural decay originates in the radical moisture, which sinks in quality from birth, animals should not enlarge and improve after infancy, in plain contradiction of experience. Given the axiom that anything repaired gradually and completely can potentially endure forever (like a vestal flame), the evidence of experience indicates as the source of corruption not what is being repaired but the means of repair. Natural dissolution occurs, Bacon concludes, because the parts responsible for repair fail.[6]

[6] Bacon's refutation contains a few shortcomings. One is that he oversimplifies the account of aging provided by the medical tradition he inherited. A survey of classical, Medieval, and early modern medical writings demonstrates that their

It is important to note that, as seen here, Bacon's biggest qualm with the radical moisture theory is the defective apposition of the moisture's repair. Bacon still retains the concept of a dewiness or moisture deeply embedded in the parts of the human body.[7] He even calls such moisture "radical," opposing it to "adventitious" moistures and juices.[8] But his radical moisture is not irreparable.

Bacon has more qualms with radical moisture theory, however. For the rest, one must turn to another text. His largest confutation occurs in *De Viis Mortis*, a manuscript written prior to *The History of Life and Death* in which he works out many of his ideas about natural dissolution. In the manuscript, Bacon attacks the theory for more than just its tenet of defective apposition. For instance, he drags in the complementary "fiction" of native heat (OFB VI.270-1). Again ignoring debates among previous writers, Bacon explains that native heat was also thought to be most abundant at birth. He then rejects it on grounds similar to those on which *The History of Life and Death* rejects radical moisture: "the very sense itself" disproves it, for "touch, motion, concoction, and all the

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authors did not speak univocally about radical moisture. For instance, Bacon's summary ignores the ways Galen himself and, later, Jean Fernel tried to accommodate the theory to the evidence of growth. Moreover, it shares a questionable presupposition with the traditional doctrine. Can the intellectual concept of potentiality for permanence dictate adequately the possibilities of a body's perdurance in time and space? To this day, proponents of so-called "wear-and-tear" theories of aging think not.

[7] If we look carefully, we see that Bacon's argument above does not refute the principle of radical moisture *in toto*; it refutes only the tenet that a set amount of radical moisture must steadily decline as one ages. For Bacon's argument to work, it must counterpoise as the only possible sources of corruption the means of repair and the quality of the thing being repaired, which in this case is not the body as a whole, which presumably includes the very parts that serve as means of repair, but the radical moisture itself. If those are the only possible sources, and then if a defect in radical moisture cannot be the origin of corruption, the means of repair must be. Yet in the passages above, Bacon switches very casually the identity of the thing being repaired. In the first sentence of the block quotation, it is the body itself. Then, in his refutation, it becomes the radical moisture. Afterwards it returns to the body itself, the dissolution of which he immediately goes on to describe. The slip affords a proponent of the traditional theory the opportunity to argue that Bacon's brief rebuttal leaves room for radical moisture at its end. All that is necessary is to revise the theory by removing the tenet that radical moisture contains a defect within itself that necessitates the decline of its quality. Instead, the argument would run, the quality of the moisture falls because of the very thing that Bacon so astutely deduces, the failing means of its repair. In that case, the animal body still houses a primigenial moisture which the activities of life deplete, but deplete indirectly. Further changes to physiology might be needed, but logically Bacon's rebuttal does not eradicate the notion of a simple, vital substance as a source of natural dissolution, although perhaps it does eradicate the notion of it as the only source.

[8] See OFB XII.288-9 for Bacon's admission of radical moisture. Note that he inserts before the adjective *Radicali* the parenthetical "*si placet*." He seems to be adopting a customary name for the sake of convenience while altering important components of the customary notion behind it. The discrepancy between adventitious and "radical" moistures can be found in Century IV of *Sylva Sylvarum* (SEH II.454-5).

functions and signs tell us that a man's heat far surpasses that of a child" (OFB VI.272-3). The idea that native heat declines from birth in consequence of the radical moisture's decline from birth clashes with the fact of increasing vigor in youth. Roughly, this rebuttal amounts to the same heard in *The History of Life and Death* but with different evidence of maturity (vigor, not size) directed against a different but apposite branch of the theory (heat, not moisture).

Of the radical moisture proper, the confutations in *De Viis Mortis* are more striking. Bacon offers two, each directed toward the primigenial aspect of radical moisture. The first appertains once again to growth in youth, but instead of invoking contradictory evidence, Bacon turns to the over-strenuous demands that the theory makes upon the imagination. He finds it "very difficult to believe" that the same puny amount of primigenial moisture "which can only spread out but not increase in quantity" can come to occupy "a body in as great a diversity of mass as may between a tiny child and an adult." That a tiny bit of radical moisture can suffuse an animal's entire body is hard to swallow.[9] Nonetheless, Bacon does not consider it the critical problem. In fact, he allows it as "not wholly incredible" on account of "the highly divisible nature of things" (OFB VI.270-3). The critical problem resides in the transference of the radical moisture from parent to offspring, the source of Bacon's second confutation.

The prevailing theory maintains that each animal receives from its parents the same amount of moisture that the parents each have. Remarkably, that amount does not diminish across "endless generations" although it is tiny and although it must spread "in the very smallest portions" throughout the body, last as long as the animal can reproduce, and yet always be large enough to produce whole other animals bearing the same amount of radical moisture as the parent initially had (OFB VI.272-3). Again, the old theory taxes the imagination, but this time to an extent at which Bacon thinks absolute repudiation is justified. The difference for him seems to be the "endless generations." As Bacon says, he is willing to concede the first postulate, that a small amount of moisture filling a child can fill

[9] For Arnald de Villanova's objection to this facet of radical moisture theory, see Chapter 1.

an adult, because nature exhibits profound divisibility. In the manuscript *Cogitationes de Natura Rerum*, written during the same decade, Bacon defends the doctrine of the atom on similar grounds. Although one cannot see atoms individually, he writes, one can imagine their presence because of the evident ability of larger objects to divide into invisible particles. He gives the example of a bit of saffron placed in a barrel of water or a bit of civet in a room; a little is enough turn the barrel-water yellow or to fill two or three rooms with its smell (SEH V.419-20). The phenomenon of divisibility makes possible the permeation of primigenial moisture through an animal body whether in infancy or adulthood. But what Bacon allows with caution to the individual animal he denies outright to the species, for the dispersal of a tiny amount of radical moisture through an entire species beggars the mind. Again, the amount would have to outlast endless generations. Nature's divisibility has a limit even for Bacon, or especially for Bacon. After all, a limit to divisibility was the point of his atomism, and belief in the very thing that makes primigenial moisture primigenial demands that one deny that limit.[10]

In *De Viis Mortis* Bacon also turns to the contrarian physiology of Bernadino Telesio in order to oppose the radical moisture theory. Although in *The History of Life and Death* he neglects discussion of Telesio, his appraisal of Telesio's ideas in *De Viis Mortis* lays the groundwork for his own analysis of natural dissolution, revealing a conception of the whole phenomenon of senescence that does not appear so straightforwardly in the later work. A review of his discussion of Telesio seems appropriate here, because it results in a conception of senescence in the round, a broad rather than detailed view.

[10] Because such arguments would help Bacon destabilize the theory of radical moisture even more than *The History of Life and Death* already does, we might wonder why he did not add them there. Of course, that question and the related question why he included the argument that he did instead of them, ultimately are insoluble. But here is one plausible answer. The one confutation that he did publish rests on the evidentiary contradiction of the one tenet that most directly opposes his own effort to study and enhance the means of repair. Perhaps Bacon did not wish to worry readers with a longer debate over a theory that he considered outworn. Possessing (so he believed) a new physiology better capable of realizing the practical aim of prolonging life, perhaps he desired to handle only the one article standing in the way of an investigation of bodily repair, and then get on to the task at hand.

In *De Viis Mortis*, Bacon sets Telesio's unusual physiology, found in his best-known work, allusively titled *De Rerum Natura juxta propria principia* (1586), over and against that of the dominant medical tradition. Generally, the Italian's natural philosophy earns Bacon's measured praise. In *De Augmentis*, he refers to Telesio as the "instaurer" of the pre-Socratic philosophy of Parmenides who fashioned out of ancient remains a new philosophy more vibrant and factual than that of the schools (SEH I.564, IV.359). But Telesio was, for Bacon, a perilous instaurer. His most famous disciple, Storio Donio, whom Bacon also cites, was a heretic who pushed Telesio's conception of human physiology into the realm of atheism that previously it had skirted. More directly, though, Bacon charges Telesio with distorting the nature of things. In particular, he charges Telesio with attributing far too many effects to his fundamental binary of hot and cold. Bacon writes that Telesio did not decipher adequately what makes hot things hot and cold things cold and therefore sometimes confused causes and effects (OFB VI.251-67). In spite of its virtues, then, Bacon finds that Telesian philosophy can mislead discovery.

That being said, he does not blanch to deploy Teleisan physiology. He employs it in order to upset classical physiology and extract from the dialectic between the two what he sees as a better conception of aging than either possessed. Graham Rees has rendered an insightful account of this dialectical exchange.[11] As Rees explains, what attracted Bacon to Telesio's physiology was its ability to account for the increase of heat and bodily powers between infancy and maturity. Unlike classical physiology, Telesio's physiology accommodates growth, especially the growth of heat. Telesio alleges that the temper of an animal's body alters after middle age from colder to hotter, not the reverse. The source of the heat is the liver. In infancy and childhood, the liver is "sweet of taste" and "purplish red" whereas in old age it is "thick, hard, salty, bitter, and black." Each kind of liver produces blood of similar type. From these facts, Telesio deduces that a young liver possesses "a thin and caressing heat" whereas an old liver possesses "an abundant and vehement heat." Because its

[11] OFB VI.lxv-lxix.

heat is weaker, the younger liver "makes the softer and thinner parts of its own matter and of the imported chyle into a fineness which it can draw out." As it grows older and hotter, however, the liver "makes the softer and thinner parts of its own matter and of its imported chyle into the utmost fineness." Over time, the liver destroys itself and thins the blood it produces. The thinner, hotter blood distributes the liver's heat to the rest of the body, "for the liver's heat is productive of itself. Fired by the longing and bestowed with the faculty of enlarging itself to the utmost by breaking out into the whole body, it continuously generates and enlarges itself, and pours into the mass beyond it."[12]

Bacon interprets Telesio to mean that the cause of death is to be sought "not in any kind of wasting away but in superfluity." As the blood manufactured in the liver turns "fiercer and sharper" [*acriorem*], it gradually fails to refresh the body (OFB VI.270-1). From Bacon's viewpoint, Telesio's account has the dual advantages of encompassing the phenomenon of youthful growth and of rooting decay in the means of repair. Nevertheless, Bacon does not halt here. Although Telesio is more right than wrong, he continues, Telesio is not wholly right. While "not untrue" that after birth heat increases with age, eventually it reaches a peak after which it declines: in Bacon's words, "in the course of time, it reaches a point where the very heat is reduced, and instead of growing clearly diminishes and gradually fails." Thus, like classical physiology, Telesio "mistakes…a segment of a circle for the whole thing," but, whereas classical physiology distorts the facts before maturity, Telesio distorts them beyond. Bacon avers that the obvious "sluggishness" of motion and faculties in the aged plus the "weakness of digestion, the phlegmatic illnesses, the enervation" and even the sense of touch, all confirm the decrement of heat in later years of life (OFB VI.272-3). Where precisely the apex of heat lies Bacon does not conjecture, but in the *Siva Silvarum* he claims that heat continues to increase into the vaguely dubbed "middle age" (SEH II.459). Between classical and Telesian

[12] Bernardinus Telesius, *De Rerum Natura juxta propria principia* (Naples, 1586), 247. The translation is mine.

physiologies, then, *De Viis Mortis* offers a compromise that Bacon believes corresponds to the facts: after birth, heat increases until sometime after maturity, when it decreases.[13]

This broad description of aging as first an increase of heat and then a decrease of heat indicates an important limitation to *The History of Life and Death,* especially its critique of radical moisture theory. The same broad description of aging appears nowhere in the later text.[14] The basic idea may underpin Bacon's inquiry; for instance, he still measures the activity of organs and faculties by their heat, which he says diminishes in old age (OFB XII.316-17). But the only general description of natural dissolution offered in *The History of Life and Death* is that natural dissolution is a kind of imperceptibly slow desiccation. While Bacon goes on to unpack the various steps and components of this drying process, his earlier depiction of age as increasing heat followed by decreasing heat may not square with the theory of senescence that he finally details. In *The History of Life and Death*, the question why the body's heat climbs in intensity until some point in middle age and then falls, rather than just falls continuously from birth, is never answered. The discrepancy highlights the boundaries that Bacon places upon the book. *The History of Life and Death* addresses only a portion of what one might expect from its title: the decline of vitality toward death but not its build-up after birth. Thus, it does not give a complete picture of what happens within an animal body through the entirety of the life cycle. Instead, it concentrates on only one side of the cycle, the downward side, presumably because of its practical aim of conquering senescence. Most significantly, it does not explain the physiological connections between the periods of growth and senescence. That lapse would seem to carry practical implications that, for whatever reason, Bacon overlooks. Would not discovering how a young body can repair itself so capaciously that it grows

[13] Although in *The History of Life and Death* Bacon still considers heat and cold to play major roles in senescence and, consequently, in the prolongation of life, he differs from Telesio in that he rarely if ever mentions the "sharper" [*acrior*] heat of the body entire. Instead, he quite often mentions the "sharper" [*acrior*] heat of spirits in particular. The heat of small, pneumatic bodies receives emphasis. That may have something to do with his investigations of matter during the previous decade. *De Viis Mortis* and other manuscripts of the period refine his ideas about just what "heat" and "cold" mean. His definition of heat in Book II of the *Novum Organum* is an attempt to give at least one of the words a practical meaning. In later pages of *De Viis Mortis*, he begins to decipher bodily heat as, in part, an effect of vital spirits, the control of which assists the prolongation of life.

[14] Rees ignores this difference between the two texts.

also disclose something useful for prolonging life? Bacon does not say. More clearly, the lapse impinges upon his confutation of the radical moisture theory, because the phenomenon of growth is the very thing over which Bacon expressly falls out with the older theory. If he were to investigate the processes underpinning growth more thoroughly, presumably he would have to develop his ideas about the body's heat and the patterns of its changes across the lifespan. Without the connection between growth and senescence elucidated, his own theory still may suffer from the same problem with which he faults the radical moisture theory. It may fail to give a plausible account of why in youth the body enlarges and the vigor of the faculties improves.

Section (c): Bacon's theory of senescence

In the Preface of *The History of Life and Death* Bacon concludes that the means of repair, not a defect in radical moisture, is at fault for natural dissolution. With that conclusion he shifts the perspective on natural dissolution from the broad to the close and alters the approach from the phenomenal to the technical. Antonio Perez-Ramos has argued that Bacon's natural philosophy supplants the classical conception of knowledge as what a user or spectator knows with a technical conception of knowledge as what a maker knows.[15] At this moment in the text, Bacon makes that very move. For him, natural dissolution of a living thing occurs not simply through the thing's living—the cause suggested by vital substance theories of senescence and even by the life-flame analogy that Bacon deploys—but through the structures and arrangements of parts.

As Bacon himself explains, the first thing that one should know about his theory of senescence is that senescence results from allometric repair. That is, repair happens at different rates for different kinds of parts. According to Bacon, the kinds are two, the moister and the drier. Of moister parts, he expressly identifies "spirit, blood, flesh, and fat." Of drier parts, he expressly identifies "tunicles, nerves, arteries, veins, bones, cartilages, most of the innards too, and nearly all

[15] Antonio Perez-Ramos, "Bacon's Forms and the Maker's Knowledge Tradition" in *The Cambridge Companion to Bacon*, ed. Markku Peltonen (Cambridge: Cambridge University Press, 1996), 110-113.

the organic structures" (OFB XII.146-7). The repair of the sets is allometric because the drier parts resist the repair of nutrition to a greater degree than do the moister. More precisely, "in our declining years" [*vergente aetate*] repair becomes especially uneven, or "*inaequalis admodum*," translated by Rees as "extremely patchy."

The challenge that Bacon takes up, however, is not so much why that decline happens at a certain period of life as how the slower repair of one group of parts affects the repair of the other group of parts. Bacon first approaches that question through a metaphor. He describes the body's decay as "the death of Mezentius," an allusion to Virgil's *Aeneid* VIII.478-88, which describe the punishment of the town Caere exacted by its conqueror Mezentius. Mezentius bound living men with dead corpses until the living men died from the pollution of the dead. Bacon explains, "*the living perish in the embrace of the dead*." In his metaphor, "the living" represents the moister parts and "the dead," the drier parts. But unlike the macabre metaphor, which suggests that drier parts only harm their living or moister partners, the drier parts in fact assist the moister, as the next two more prosaic sentences make clear. The harm inflicted upon the moister parts by the drier is indirect, the privation of an assistance formerly rendered:

> Now these very parts [the drier], when they ought to carry out the work of repairing those reparable parts, can no longer discharge their proper functions because their activity and powers have been impaired. The upshot of this is that not long after all parts begin to collapse, and those very parts which are intrinsically most reparable are nevertheless, once the organs of repair have given out, no longer likewise able suitably to repair themselves, but grow weaker, and at last themselves give out. (OFB XII.146-7)

Bacon maintains that the drier parts, such as blood vessels, internal organs, bone, and cartilage, perform offices that in some way redound to the repair of the moister. In ways roundabout or immediate, they convey nutriment, the material of repair, to the moister parts. Hence, natural dissolution originates in the means of repair. The organs of repair weaken first; their debility then enfeebles the repair of the moister, more reparable parts.

The origin and nexus of natural dissolution appears to be "*spiritus*." The next sentence reads, "Now the cause of this conclusion is this: that the spirit, like a gentle flame, forever predatory, with

the external air colluding with it—air which also sucks and dries blood out—, at last destroys the workshop of the body and its machinery and instruments, and renders them incapable of doing the job of repair" (OFB XII.146-7). This *spiritus* slowly impairs the vital functions of the body, including nutrition and repair. It does so in a manner that Bacon merely implies in the Preface—by desiccating the drier parts further. Spirits combined with the more perceptible air wreck the workshop of the body—an image suggesting both the connectedness of the parts and the mechanical quality of the process. A later section makes the feature of desiccation more explicit. Age as commonly denoted, Bacon explains, is "nothing in itself" but is "only a measure of time" (OFB XII.164-5). Age begins to make sense only when one understands it as a kind of desiccation. Like air and fire, senescence dries but does so more gradually than any other drying agent. Responsible for its supreme delicacy and power are the especially subtle spirits mixing with the air. Bacon sums up the desiccation of age: "The effect is caused by the innate spirit of bodies which soaks up bodily moisture and escapes with it, and by the ambient air which multiplies itself on the innate spirits and juices of the body and preys on them" (OFB XII.164-5). Once again, spirits and air collude, both contributing to the drying of bodily moistures and juices.

So far, Bacon's initial approach toward senescence resembles superficially that of the radical moisture theory and classical physiology. Although he does not lump the exact same parts into his category of less reparable parts, he does designate a category that resembles that of the so-called spermatic parts of classical physiology, also thought to have been more resistant to repair.[16] Moreover, he speaks of natural dissolution as a process of drying: the spirit joins with the surrounding air to disperse the moisture and juices of the body. Finally, the term "spirit" nominally recalls the principal factor in the drying of radical moisture, and is something akin to fire, as were medical spirits and native heat.

[16] For more on spermatic parts, see Chapter 1.

But Bacon's alterations run much deeper and are more numerous than a first view might grasp. A chief difference between Bacon's account of senescence and that of classical physiology is that the latter analyzes the process of senescence as something qualitatively unique to living things, whereas Bacon opens his investigation on two fronts, inanimate and animate. In his paradigm, "the lasting of bodies" occurs either "in simple identity" or "by repair, with the first belonging to inanimate bodies alone, and the second to vegetables and animals, where it is accomplished by alimentation" (OFB XII.150-1). The first part of Bacon's "twofold" inquiry examines the kind of endurance that animate things share in common with inanimate ones, and second, the kind of endurance that animate things reserve to themselves alone.[17] The first concerns consumption by spirits and the air, with the therapeutic aim of curbing that consumption as much as possible. Bacon avers that this consumption "has a great deal in common with what happens in inanimate bodies" because "what the innate spirit (present alike in all tangible bodies living and non-living), together with the ambient air, does to inanimate things, it also tries to do to animate ones" (OFB XII.148-9). Consumption and desiccation affect all things animate and inanimate.

The second part of his investigation concerns what divides organic from non-organic matter: the "whole process of aliment, which brings about renewal." This second part concerns the human body's inborn means to repair the damage done by consumption and thus carries the therapeutic aim of strengthening alimentation as much as possible. Although the innate spirit tries to do the same things to animate and inanimate bodies alike, the "superadded" vital spirit, or *Spiritus vitalis*, of animate bodies "partly tempers and blocks its operations, and partly intensifies and increases them to no end" (OFB XII.148-9). This superadded vital spirit is distinct from the innate spirit, which Bacon later names mortual spirit, or *Spiritus mortualis*. It tempers and blocks the consumptive actions of the mortual spirits through renewing what has been lost. At the same time, however, it intensifies the consumption of the body's moisture and juices: "For it is perfectly obvious that many inanimate

[17] Bacon does posit that inanimate things, in particular pneumatics such as spirits, air, and fire, also "repair" themselves. I discuss this qualifier in Chapter 7.

bodies can last for a very long time without repair; but animate ones without aliment and repair rapidly break down and die just like fire" (OFB XII.148-9).[18] It is evident that vital spirit consumes living bodies, because animals lose their bulk more rapidly when they are alive but unnourished than when they are dead.

These are, then, the two parts of Bacon's inquiry into the prolongation of life: the human body as "something inanimate and unnourished" and as "something animate and nourished" (OFB XII.148-9). They correspond to the two "true ways of natural death," the consumption enacted by the mortual spirits colluding with air and the gradual defection of the repair normally enacted, in part at least, by the vital spirit (OFB XII.148-9). They further correspond to the two kinds of duration, in simple identity and by repair. Whatever is unique to the natural dissolution of living things, it happens partly because of the properties of non-living matter constituting and surrounding living things. Momentarily, the part played by non-living matter looks as though it will occupy just half of Bacon's inquiry. As the inquiry progresses, though, it grows to occupy more than that—not in space necessarily but in its consequence for Bacon's theory of natural dissolution. Bacon rests natural dissolution upon it. Although repair by alimentation remains for him a grave concern too, without which living things cannot continue in life, repair cannot work properly unless the non-living matter that constitutes a living thing persists in its identity.

Consequently, one of the great riddles posed by *The History of Life and Death* is how desiccation, an inanimate process, engenders natural dissolution and leads to death, a phenomenon belonging only to animate things. In other words, how does the inanimate side of Bacon's inquiry—that concerning desiccation and consumption—connect back to the animate side and, more particularly, to the torment of Mezentius, from which the split in the inquiry originally erupts? By gathering relevant statements scattered through *The History of Life and Death* as well as through other texts, one can start to make some sense of Bacon's assertion that natural dissolution of the

[18] I handle Bacon's employment of the conventional flame-life analogy later.

human body ensues from the impairment of the activity and powers of parts responsible for repair. One can start to understand a little more clearly how, within his conception of natural dissolution, the inanimate process of consumption degrades the animate process of reparation. A better understanding of that action, in turn, has large consequences for understanding the remedies that Bacon endorses for prolonging life.

The place to start, it seems, is *spiritus*. In the Preface, Bacon speaks of spirit as one of the moister, more reparable parts of the human body, and shortly afterward, he says that spirit colluding with the air consumes human bodies. Once one comprehends Bacon's pneumatology, it should become clear that the spirit to which he refers in these different sentences is not the same. The spirit that is a reparable part of the human body is vital spirit; the spirit that escapes with the air, desiccating the body, is mortual spirit. To understand natural dissolution, therefore, we must understand Bacon's pneumatology, especially the differences between mortual and vital spirits.

Bacon seems to have begun developing his pneumatology as far back as 1609, with the gloss "Proserpina" contained in *De Sapeientia Veterum*. What that gloss says concerning the material composition of spirits and their interactions with tangible substances remains largely unchanged in the texts of the next decades. From then until the later emendations made to *De Viis Mortis*, Bacon identifies only one kind of spirit, which is responsible in some way for the composition and decomposition of compound bodies, a subject that fascinated him till the end of his life. Starting with later emendations made to *De Viis Mortis*, however, Bacon begins to differentiate two kinds of spirits, those found in all tangible things and those found only in animate ones.[19] The identification of a second kind seems to have arisen out his contemplations regarding life and human physiology.

Let us deal with the mortual or innate spirit first. In Latin, Bacon uses the adjectives *mortualis*, meaning "dead" or "non-living," and *innatus*, meaning "inborn" or "innate." Less often he uses instead the adjective "crude," or *crudus*. The substitution of terms can cause confusion, but,

[19] Rees situates the emergence of Bacon's theory of mortual spirits in the 1590s. For more on the development of Bacon's theory of vital spirits, see OFB VI.lvi.

really, what is more confusing is Bacon's tendency to drop the adjective altogether. In earlier works, as well as in many passages in later ones, mortual, innate, or crude spirit goes unqualified under the designation "spirit." In the therapeutic portions of *The History of Life and Death*, however, vital spirit does. Occasionally, what Bacon says about "spirit" may pertain to both kinds at once. In the following discussion, I have affixed the appropriate adjective where I think it belongs; however, a reader should keep in mind that in the books and manuscripts before roughly 1620, Bacon typically uses the word "*spiritus*" without a modifier and that, when he does so, he usually speaks of the kind of spirit that later he would come to differentiate as mortual. When I do not affix an adjective, I intend that what Bacon is saying may pertain to either or both kinds of spirit.

Mortual spirit is most distinctive because of its ubiquity upon or near the surface of the earth. In *The History of Life and Death*, Bacon asserts as a "most certain proposition" that "in every tangible thing there exists a spirit or pneumatic body hidden and enclosed in the tangible parts" (OFB XII 158-9). What goes unsaid here is the location of tangible bodies. The location of tangible bodies unfolds from an even more basic principle of cosmology explained most clearly in the manuscript *Thema Coeli*, composed around 1612.[20] That principle, implied in the quotation above, is that all matter is divided between fine or pneumatic bodies and gross or tangible bodies. The distinction between pneumatics and tangibles is fundamental, or "absolutely primordial" [*omnino primordialis*] (OFB VI.172-3). Pneumatics and tangibles each have their proper zones, aloft in the heavens for pneumatics and deep in the earth for tangibles. In their respective zones they do not mix with one another; however, in the area between those zones, that is, below the lowest parts of heaven and above the depths of the earth, they do. It is in this middle region, the region of the cosmos that we occupy, where a spirit or pneumatic body invests every tangible body. Upon or near the surface of the earth, no tangible body lacks a pneumatic body inside it although pneumatics may occur "virtually unmixed" with tangibles. As one ascends toward the heavens, pneumatics are more pure, thin, and

[20] For dating of this text, see OFB VI.xxii-xxiv.

fiery. In the upper reaches of the heavens, for instance, are the pneumatics sidereal fire and ether. Those are free pneumatics. According to the scheme found in *The History of Dense and Rare*, the spirit inside tangibles is the kind called "attached." "Attached pneumatic bodies," Bacon writes, "are those which are not found by themselves or free, but only inclosed in tangible bodies; and are the same as what are commonly called spirits." In other words, spirits do not occur outside gross bodies, only inside them. On earth, the rest of pneumatics are free although not necessarily pure. Like attached spirit, most pneumatics on earth are not pure but "imperfect." Imperfect pneumatics include various fumes, exhalations, and vapors. On earth, the only pure pneumatics are air and flame (SEH II.254, V.349).

Attached pneumatics are either mortual or vital spirit. About mortual spirits, there are three very general points worth noting. One, Bacon appears to take their existence largely for granted. He presents no clear evidence of their existence although he professes at times that the power of spirits is manifest and undeniable.[21] Two, mortual spirits appear on earth, where they do not properly belong, because the heat of celestial bodies, especially the sun, has a perturbing effect upon the gross bodies that do properly belong on earth. Bacon never stipulates whence mortual spirits emerge, but as early as the "Proserpina" gloss he attests that celestial bodies are a factor in their production or liberation (SEH VI.681, 760). Celestial heat awakens spirit in the midst of gross bodies as though spirit is a thinner outgrowth of tangibles. Nevertheless, Bacon appears not to conceive of the two kinds of bodies as ontologically continuous. Mortual spirit may be unlocked from gross bodies rather than created from them. In a passage in *Thema Coeli* denying the continuity of soft and fluid bodies, he writes, "it is the way of nature to proceed a certain distance by gradations, and then suddenly by jumps; and to alternate this process; otherwise there could be no structural fabric, if all changes proceeded by gradations" (SEH V.549). The division between pneumatic and tangible is part of the fabric designed by nature. Even though spirit arises from gross bodies, the two are mysteriously

[21] See especially NO II.48; also see OFB XII.158-9.

discontinuous things.[22] Three, and most important, mortual spirit is real body, as is vital spirit. Although intangible and invisible, all spirit whether mortual or vital takes up space. It has extension. Furthermore, it is not some mysterious force or power in the universe as celestial *pneuma* was thought to be. Bacon insists on both points in *The History of Life and Death*: "Now this spirit of which I speak is neither some virtue or energy nor an entelechy or silly trifle; it is plainly a body thin, and invisible, yet something real with place, and extension" (OFB XII.346-9). This proviso deflects connotations that his word choice would have carried for a seventeenth-century audience. No doubt, Bacon's language—"*spiritus*," "pneumatic"—would have conjured up the *pneuma* of ancient physics and natural magic along with its associate, the World Soul, an idea that Bacon blankly discredits. Traditionally, *pneuma* was the "vital" force in all matter, responsible for maintaining the coherence of forms and for ensuring that matter becomes what it is supposed to become. Though often conceived as a real body too, it was additionally an energy or, even more appropriately, an entelechy. Bacon sets his spirits in contrast to *pneuma*. Spirits are merely rarefied bodies tucked away invisibly into other objects easier to perceive. Despite their ubiquity and their contributions to the coherence and dissolution of compound bodies, mortual spirits still do not contain a special teleogical blueprint for the arrangement and growth of all things.

Like some other pneumatics, the attached pneumatic, spirit, is weightless and invisible. But more strangely, both kinds of spirit yoke together the heterogeneous natures of air and flame. According to the scheme of the universe outlined in *Thema Coeli*, both pneumatic and gross bodies divide under two larger genera, bodies "which abhor and ones which conceive flame" (OFB VI.172-3). These genera, or "two great families of things," occupy "by far the greatest part of the universe" (OFB VI.172-3). They correspond to the two pure pneumatics on earth, air and flame. Although both air and flame are pneumatic, Bacon insists that they are heterogeneous and that flame is not, as conventionally supposed, air on fire. Through all zones of the cosmos the opposed genera of flame-

[22] A later portion of this chapter covers this point in more detail.

resistant or "crude" bodies and inflammable bodies subsist. In the upper heavens are ether and stars. At the surface of the earth are water and oil. Well below the surface of the earth and constituting gross bodies are mercury and sulphur (OFB VI.172-3). The last division, of course, reflects the binary of metals promulgated by the pre-Paracelsian alchemists.

Attached pneumatics, or spirits, fall into both categories: "They partake both of an oily and a watery substance, and are nourished by the same; which on being converted into pneumatical substance, constitute a body composed as it were of air and flame, and combining the mysterious properties of both" (SEH II.254, V.350). Spirit upholds the dichotomy at two levels, in its substance and in its nutriment. Spirit consists of something air-like and something flame-like, but it takes as its nutriment watery and oily substances. In *The History of Life and Death*, Bacon reiterates a conventional rule of nutrition that for something to be nourished by what it absorbs, what it absorbs cannot be the same as itself but must be homogeneous yet inferior. Accordingly, spirit enlarges itself upon gross bodies homogeneous with its own constitution: watery substances, which being resistant to inflammation correspond to air, and oily substances, which being inflammable correspond to flame. Bacon avows, nonetheless, that spirit is not the simple combination of flame and air but is rather a nature akin to each. In the passage above, spirit is composed "as it were" of air and flame. It is airy and flamy but not air and flame together. Bacon underscores especially that spirit is not air. In *The History of Life and Death*, immediately after denying that spirit is force or entelechy, he also tries to deflect another assumption to which the name and description of spirit might lead his reader: "Nor again is this spirit air (any more than grape juice is water) but a thin body related to air but very different from it" (OFB XII.348-9). According to *The History of Dense and Rare*, spirit is not breath either but "approach[es] very nearly to breath; such as rise[s] from wine or salt" (SEH II.254, V.350). And again it is not the same as the exhalations that arise from oily substances or the fumes that arise from solid ones.

Compared with other such pneumatics, mortual spirit has less density than fumes, exhalations, and breaths but more than air and flame (SEH II.255, V.350). In fact, about the only

sensible evidence to which Bacon points for the presence of mortual spirits indicates its presence only if one conjoins preconceived knowledge of the densities and behaviors of other pneumatics. More clearly than anywhere else, Bacon perceives the action of spirit in the decomposition of things. For instance, when vegetables and animal corpses rot, they release smells; from those smells Bacon deduces the work of spirit. First, the smells are not visible as are some thicker exhalations. Next, the smells pour forth very slowly and over a long time, unlike even "invisible fumes and vapors," which pass and vanish "in a body"—that is, quickly and almost all at once. Bacon then reasons that smells must be the work of a body invisible yet even rarer than the breath of wine. Such a body is spirit. Therefore smells are the work of spirit (SEH II.256, V.351).

To confess, Bacon includes the preceding passage in *The History of Dense and Rare* to demonstrate not the presence and work of spirit but something else. His enthymeme hides the chain of logic listed above. What Bacon seeks to show is that mortual spirit is denser and cruder than air. That is another important point about the composition of mortual spirit. Because it conveys smells, the smells also indicate that the spirit attached to all tangible objects retains something of the grosser bodies upon which it nourishes itself. Thus, Bacon concludes, it is denser than air. Moreover, it is cruder than air. The word "crude" [*crudus*], which Bacon often affixes to "spirit," signifies for him something other than just dense. More precisely, crude means showing a resistance to inflammation. Bacon judges that spirit share "an affinity with a gross nature, which is not easily thrown off" (SEH II.256, V.351). Being crude, the spirit attached to all tangible objects would seem to retain more of the watery substances upon which it feeds than of oily, for oil is inflammable, water flame-resistant.

In his natural histories, Bacon divides attached pneumatic bodies into two "natures," those crude or mortual spirits dwelling in all tangible things and "living" [*vitalis*] spirits, which dwell only in things "such as are animated, whether of the vegetable or sensitive world" (SEH II.254-5, V.350). Living spirit differs from mortual spirit in two regards, composition and continuity. When combined, however, those two differences in structure trundle out numerous differences in function. For now, I

shall review just the structural differences and reserve the differences in function for discussion of Bacon's unique analysis of consumption and desiccation.

Both mortual and vital spirits are real things extended in space yet weightless and invisible. Both, moreover, comprise flamy and airy natures. Their compositions differ, however, in the proportion of the flamy and the airy. Whereas the mortual spirits are "nearly consubstantial to air," the vital spirits possess "some inflammation" (OFB XII.352-3). They "come closer to the substance of flame" than do the mortual. Vital spirits are still principally air-like, however, as Bacon insists: his statement that they come closer to the substance of flame means that "they do so more than the non-living ones, and not that they are more flamy than airy" (OFB XII.354-5).[23] Likewise, although the vital spirits have more of the flamy nature than do the mortual spirits, the latter still participate in flame. In *The History of Dense and Rare*, because vital spirit has more of the nature of flame (the pneumatic with least density), it is also rarer than the crude, mortual spirit. Indeed, it is rarer even than air, which is a degree rarer than mortual spirit, yet it is still not as rare as flame. Because Bacon distinguishes mortual spirit from vital spirit by its crudeness too, he implies that vital spirit is better purified of the gross bodies upon which it feeds than mortual spirit is. Presumably, vital spirit converts the watery and oily substances more efficiently. Presumably again, by converting oily substance more efficiently, it acquires its more flamy nature. However more flamy it is, though, vital spirit still produces a heat that is virtually imperceptible. In *The History of Life and Death*, Bacon says that the inflammation of vital spirit is "by many degrees gentler than the softest flame from spirit of wine or anything else" (OFB XII.352-3).

[23] In *The History of Life and Death*, Bacon claims that vital spirit represents "a mysterious union of the airy and the flamy nature," whereas in *The History of Dense and Rare*, he makes the same point about both attached pneumatics. In *The History of Life and Death*, he comes closer to stating that mortual spirits have no inflammation or are not flamy at all, but given how often that book professes the susceptibility of mortual spirits to heat, he seems not to have meant quite that. Incidentally, Graham Rees misinterprets Bacon's opinion about the difference in composition between mortual and vital spirits. According to Rees, "in inanimate spirit the airy component predominates whereas in the vital spirits the flamy has the upper hand" (OFB XII.xlviii). This statement recapitulates the point he makes in OFB VI.lv and in "Bacon's Speculative Philosophy" in *The Cambridge Companion to Bacon* (Cambridge: Cambridge University Press), 138.

The second difference between mortual and vital spirits relates to continuity. Mortual spirits, sprinkled through any other tangible thing, "are not in the least self-continuous, but are as it were cut off and surrounded by the grosser body which intercepts them rather as air is intermixed in snow and froth." Although Bacon maintains that within plants and animals the vital spirit "rules and has consent with" the mortual spirits [*eos regat, & quendam habeat cum illis Consensum*], he also posits that, unlike those, it is "integral and self-consistent" [*Integralis, & per se Constans*]. The vital spirit is not cut off but maintains its continuity through "certain channels which it pervades, without being completely intercepted" (OFB XII.350-1). The arrangement of the channels through which vital spirits pass varies between the different forms of living things. In plants, vital spirit "is just branched and runs through little thread-like tubes." Yet animals have also "a cell so that [vital spirit] is not just self-continuous but is also gathered together in some hollow space, and relative to the body, in an appreciable quantity." From this cell in animals, which Bacon thinks resides "mainly in the cerebral ventricles," all the smaller channels branch. Thus plants differ from inanimate objects in that they contain vital spirits, which inanimate objects have not at all, and animals differ from plants in that their vital spirits are branching and collected, whereas those of plants are merely branching. The class of animals differs within itself, too. In lower-order animals such as snakes, eels, flies, and even birds, the cell collecting vital spirits is narrower. Hence, Bacon infers, their parts when disjoined, or (in the case of birds) their bodies when decapitated, continue to move. "But nobler animals have larger cells, men most of all" (OFB XII.352-3).

As the previous paragraph suggests, Bacon depicts both mortual and vital spirits as occupying the bodies of plants and animals, including human beings. The principal point of distinction between the two kinds of attached spirits—and the one that Bacon consistently mentions first—is the places where they are found. Although vital spirits inhabit only animate things, mortual spirits inhabit not just inanimate ones, as their name might suggest, but animate ones, too. Plants and animals house mortual spirits cut-off and interspersed within various parts, not just vital spirits neatly continuous in channels. In *The History of Life and Death*, Bacon delineates the parts of the human body in which

mortual spirits occur. Mortual spirits pervade "flesh, bones, membranes, organs, and every single part" whether those parts are attached and living or separated and dead, or whether the person whom they occupy is living or a corpse (OFB XII.350-1).

The fact that human bodies contain mortual spirits makes it possible, Bacon thinks, to treat of the natural dissolution of human bodies as a process shared with non-living things. Like non-living things, human bodies undergo consumption. Canon 2 of *The History of Life and Death* reads: "In every tangible substance there exists a spirit hidden and invested in the grosser body; and from this consumption and dissolution originate" (OFB XII.346-7). Consumption and dissolution occur because all bodies in the middle region of the cosmos comprise grosser parts and spirits. In that sense they are mixed. Because of their mixture, they tend to break down. In his explanation of Canon 2, Bacon sketches the process of consumption:

> Now the grosser parts of a thing (since they are torpid, and not very lively) would endure for long periods, were it not that the spirit stirred up, undermined, and destroyed them; and moreover preyed on the moisture of the body and whatever else it could digest into new spirit; after which the pre-existing and new-made spirit gradually escape together. (OFB XII.348-9)

The "thing" in the phrase "the grosser parts of a thing" is literally any "thing" [*Rei*] living or non-living. The grosser parts contained within things are of a "torpid" nature [*Naturae Pigrae*] and "not very lively" or not very mobile [*nec admodum Mobilis*] and, as such, would last much longer than they do if the spirits also contained in things did not incite them out of their torpidity while feeding on moisture and stealing away with it. Gross or tangible body, by itself, is almost eternal; in fact, in *The Description of the Intellectual Globe* Bacon speculates that deep in the earth where gross bodies may reside with little to no spirit mixed among them they could last as long as the heavenly bodies, commonly thought to be eternal (SEH III.750, V.526).[24] Being dense and torpid, a tangible body by itself can last if not for eternity then for a very long time, but Bacon guesses that pneumatics can too, so long as they occupy their most amenable domain, the uppermost part of heaven. Corruption

[24] Because Bacon uses the comparison to undermine the notion of the eternality of anything in the cosmos, one should put the emphasis on "almost."

happens at a vastly accelerated speed in the domain that we inhabit because only here do spirit and tangible things thoroughly mix.

In this middle region, corruption occurs through the process of consumption. Consumption is the process whereby "what is lost in one body takes up residence in another" (OFB XII.346-7). The receiver is "some other body nearby," commonly the air, spirit, or some other pneumatic that because of its fineness of structure is mobile and invasive (OFB XII.346-7). In inanimate things the spirit involved in consumption is strictly the mortual variety; however, in animate things it can be either that or the vital. The vital spirit can convert moistures or juices of the body into more vital spirit, but the kind of spirit that consumes the human body by colluding with the air is the mortual. We know this from the more detailed picture of consumption that Bacon draws.

Although, strictly speaking, consumption is the transference of part one material body into another material body, Bacon also refers to consumption as a process affecting the human body, a composite whole, in which case it contributes to desiccation. Desiccation happens through a sequence of three stages. The first two of these, attenuation and escape of spirit, belong to consumption, as substances of the human body are converted into spirit and afterwards absorbed by the surrounding air. Although mortual spirit is capable of both actions, vital spirit is capable of only the first.

The first action of consumption-desiccation is attenuation. In Bacon's theory of matter, rare bodies (pneumatics) are more aggressive, whereas dense bodies (tangibles) are more torpid (NO II.48). Attenuation happens as the rare, mobile spirit encroaches upon the grosser substances and attempts to assimilate them. Such spirit may be either mortual or vital, for Bacon affirms that either kind of spirit desires to multiply itself. While kept within tangible bodies, each struggles "to make something like itself, and prey on the volatile material in the grosser parts" (OFB XII.354-7). When spirit preys on such substances it converts them into new spirits, or as Bacon likes to say, "multiplies itself upon them." Assimilation or multiplication is the one aggressive desire shared by both spirits. The substances upon which spirit preys, however, must be watery or oily, for spirit can generate new

spirit "only on things which are a degree closer to the spirit, like moist bodies" (OFB XII.356-7). Both mortual and vital spirits, then, would seem capable of stirring up, undermining, and destroying parts of the human body as they convert them into themselves.

The second action of consumption-desiccation, the escape of the spirit, belongs to mortual spirits alone. Unlike vital spirit, which has only one aggressive desire, mortual spirit has two. Not only does it wish to multiply itself upon certain grosser substances, it also longs to escape them altogether and mingle with its "connaturals," especially the air. Mortual spirit finds nearby not just stray particles of air but indeed "the very globe of its connaturals," to which it moves even more eagerly. Furthermore, the air itself has a desire to combine with mortual spirits, making their escape a "twofold action arising in part from the spirit's appetite, and partly from the air's" (OFB XII.354-7). The air preys upon moist parts as the spirit does, but it also preys upon the spirit itself. Another reason to suppose that mortual spirit and not vital spirit fulfills the second action of consumption, besides the reason that only mortual spirit has the desire to escape, is that the air multiplies itself upon the departing spirit. In Bacon's view, rarer bodies can feed upon denser, but not the other way around. Because air is rarer than mortual spirit but denser than vital, the spirit upon which air multiplies itself must be the former and not the latter.

As long as the human body is surrounded by air, the vital spirit experiences neither push nor pull to escape. Vital spirit lacks the desire to escape because, while near the surface of the earth, "it has no connaturals nearby" (OFB XII.354-5). Without connaturals nearby, no desire to join with something else can conquer its desire for self-continuity or its aversion to heterogenous substances outside. Rather, vital spirit exhibits a great fear of escaping the plant or animal enclosing it. Thus vital spirit does not venture outside although it may venture to the limits of a body in order to obtain something attractive to it. It has only one desire, to assimilate or multiply itself. While in its channels, it multiplies itself upon the moistures and juices of the body, in particular arterial blood. The word "juice" [*succus*], which Bacon prefers to *humor* and *humidum*, includes the nutritive liquids

applied to various parts by the blood and the blood itself.[25] It is upon the blood that the vital spirit properly feeds, as Bacon declares at the end of *The History of Life and Death*: "In fact, the [vital] spirit is repaired by the fresh and bright blood of the narrow arteries which work their way into the brain" (OFB XII.376-7).

A key to natural dissolution, consumption is nevertheless a somewhat slippery term in Bacon's lexicon. In *The History of Life and Death*, most frequently it designates the combination of the actions attenuation and escape. Thus most frequently it refers to the work only of mortual spirits, for only those strive to escape the tangible substances enclosing them. But Bacon ascribes to vital spirits the power of consumption as well; most clearly, when he delineates the first operation for preventing consumption. As mentioned, the superadded vital spirit consumes a living body more quickly than the mortual spirit colluding with the air do by themselves. By "consumption," then, Bacon may mean two different things at different times: the absorption of a grosser part by spirit or that absorption plus the escape of spirit.

It is the latter, the kind of consumption exacted by the mortual spirits in combination with the air, that triggers senescence. Without repair by nourishment, the consumption exacted by vital spirit swiftly brings about death; however, the mortual spirits persist in desiccating the body in spite of repair, eventually drying out bodily parts faster than they can be restored. This drying is natural dissolution, which is amplified once it attacks the organs and parts involved in repair, including the vital spirit. Natural dissolution thus begins with an inanimate event, the multiplication of mortual spirit.

The multiplication of mortual spirit poses a danger, in Bacon's view, largely because it increases the potential for the escape of spirit and moisture together. As mortual spirits accumulate, especially if they accumulate unevenly across a body, they become more predatory and more desirous of flight (OFB XII.358-61). In the "Major Observations" appended to the inquiry into Durable

[25] The word *succus* is another word commonly used by Fernel.

Nature, Bacon clarifies the contribution of spirit's escape to natural dissolution. Because the spirit found in all tangible bodies "is the source of all dissolution and consumption," the "antidote" to dissolution and consumption, Bacon proposes, is "to detain the spirit" (OFB XII.158-9). Bodies can detain mortual spirits and thereby prevent dissolution and consumption in two ways, "either by close confinement as if in prison, or by a kind of voluntary detention" (OFB XII.158-9). That is, either unwillingly or willingly. The difference between the two ways of detaining spirit is a tenet of Bacon's pneumatology that dates back to his gloss "Proserpina, or the Spirit," published in *De Sapientia Veterum* (1609). Bacon interprets the myth of Proserpina, who was ravished by Hades and taken to his domain beneath the earth, as a story veiling Nature; in particular, "the source of that rich and fruitful supply of active power subsisting in the under world, from which all the growths of our upper world spring, and into which they again return and are resolved" (SEH VI.681, 759). Proserpina signifies "ethereal spirit" imprisoned "by violence" in the lower globe where her summer processes and winter recesses dictate the patterns in the lives of plants (SEH VI.681-2, 759-60). While explicating the myth, Bacon declares that two ways exist by which to restrain spirit "in solid and earthy matter." One is by "simple imprisonment and violence," the other is "spontaneous and free." Harder and more durable substances such as "metals and minerals" prevent spirit's escape in the first way, "chiefly perhaps by the solidity of the mass." In other words, the very tightness or density of structure of hard solids forces spirit to remain within.

Plants and animals, though, restrain mortual spirits largely in the second way, which according to the "Prosperina" gloss amounts to "administering some suitable aliment." Mortual spirit stays spontaneously and freely within a "porous body" of a plant or animal "from which it could easily escape" because there it finds a suitable aliment. "When the imprisoned spirit begins to feed and nourish itself," Bacon continues, "it is no longer in a hurry to escape, but becomes settled as in its own land"—as he construes Proserpina's pomegranate to signify (SEH VI.682, 760). It would seem thereby that the aliment provided by animals and plants is their moistures, oils, and juices, upon which the spirit multiplies itself. The solid parts of metals and minerals offer it no such nourishment.

In 1623, in *The History of Life and Death*, Bacon adds to both modes of detention details not included in the "Proserpina" gloss. As for unwilling detention, he adds the reasons why mortual spirits relinquish their desire to escape from dense tangibles. Elaborating Rule 15, "Spirit in a body of solid structure is kept in, albeit reluctantly," Bacon notes, "All things dread solution of their continuity, but this varies according to their density or tenuity; for the more tenuous bodies are, the smaller and tighter are the passages into which they will allow themselves to be driven." All things desire to retain the continuity of that form or shape they assume when not under unusual pressures, yet, as Bacon proceeds to observe, air can squeeze into spaces where water cannot and spirit and flame into spaces where air cannot. Thinner, more rarefied bodies exhibit a weaker desire to preserve continuity. But, he adds, even thin spirit has a limit to the compression it will tolerate, as demonstrated by its acquiescence to less porous structures imprisoning it such as "a hard body, or indeed a greasy or tenacious one (which is not easy to part)." In either of those, spirit "does not labor so much with the desire to get out that it [suffers itself to be discontinued and] forced into pores and passages which are too narrow." The desire for self-continuity outweighs the desire for escape. The spirit yields the fight as "its desire to get out slackens," which is why, Bacon supposes, the spirits of metals and stones "take ages" to escape unless heated by additional fire or unless the grosser parts are broken down by "corrosive waters," and why too spirit lingers so long "in tenacious bodies like gums" unless the grosser parts are thinned by heat (OFB XII.362-3).

From Rule 15, it follows that spirits seek escape up to the point that their effort impends destruction to their own continuity. Even in plants and animals, spirits can be forced to remain inside, not just persuaded to by suitable aliment. In fact, Bacon applies Rule 15 not just to metals and minerals but also to human bodies. In human bodies are certain parts harder, more tenacious, and more solid than others. Those parts may check the escape of mortual spirit less by providing it aliment and more by shutting off its passage. Indeed, Bacon asserts that "the juices of a hard body" and "a firm skin" assist in promoting longevity "because they place the spirit in close confinement and stop it getting out" (OFB XII.362-3).

The desire for continuity might also help explain why vital spirits are more content with their situation inside animals and plants than are mortual spirits. Vital spirits, unlike mortual spirits, which are scattered through all parts of the body in ratios determined seemingly by the crossed desires to preserve continuity and to escape, keep to channels. The channels in which vital spirits travel help them preserve their continuity. Their desire for continuity overcomes their revulsion to the grosser parts encasing them.

As for the willing kind of detention, Bacon adds that it comes to pass on "two conditions," or more literally, by a double cause [*duplici ratione*]: "if the spirit itself is not too mobile or sharp, and if, moreover, it is not encouraged to leave by the air outside." His exposition of the Proserpina myth does not mention two conditions or a double cause, just one condition and one cause. The provision of suitable aliment redounds only to the blunting and restraint of the spirit's sharpness and motion, but not to its safe removal from the air. The mortual spirit must be kept both to a certain quality of motion or excitement and to a certain position, which is away from the call and grasp of the air. Such conditions assuage the mortual spirit. Indeed, Bacon uses the verb "*invitatur*" to designate how the so-called voluntary confinement works. Calmed and blocked from air, it is invited to stay.

From his theories concerning mortual spirits and tangible bodies Bacon deduces two kinds of tangible substances "that last," or are durable [*Durabilia*], a deduction which, given observations made later in the book, he seems to think experience confirms. The tangibles that endure are either hard or oily. A hard substance detains spirit by the first means, by imprisonment; it "holds the spirit down" [*Durus constringit Spiritum*]. An oily substance detains the spirit by the second means, voluntarily; it provides the two conditions. An oily substance "partly calms the spirit, and partly works in such a way that it is encouraged less by the air," because, as Bacon concludes, "air and water are consubstantial, as oil and flame are" (OFB XII.158-9). According to Canon 16, mortual spirit resides in oily or fatty things willingly because: the latter do not stress its continuity very much; they resist quick digestion; and they have little in common with the air (OFB XII.362-3).

Consumption and corruption occur much more quickly in tangible bodies that are watery, much more slowly in ones that are hard or oily. The bodies of plants and animals, of course, are not completely watery, hard, or oily, but consist of parts exhibiting variable degrees of each. Thus their different parts may be consumed at different rates. Moreover, many of their parts are hard yet not as rigid as minerals or soft yet not as liquid as water. Such composition makes plants and animals highly susceptible to desiccation, a process connected to consumption and afflicting inanimate and animate bodies alike.

Bacon devotes the second inquiry of *The History of Life and Death* to "Desiccation, the Prevention of Desiccation, and the Softening of Things Desiccated." The study of desiccation in "natures durable" is quite important to the prolongation of human life because of what it reveals about human bodies enduring through time. Properly speaking, "age" [*Aetas*], Bacon says, is not defined by the changes in vital signs often associated with human senescence—decrease of sensory powers, loss of mobility, poorer digestion, or weaker appetite, the kinds of things that other writers of his time typically subsumed into the cynosure of old age, the general reduction of the "strength" of bodily functions. Tied back to the other components of the radical moisture theory, the reduction of functional strength is explained by a near-tautology, the loss of native heat, which is the body's functional strength. Although Bacon recognizes the same changes that everyone else did, more than most he distinguishes the consequences of old age from its cause. The cause of senescence adheres to inanimate as well as to animate things. Of the signs often associated with human senescence, wrinkles indicate better the origins of aging. Old age is a drying:

> Now age is nothing in itself (it is after all only a measure of time) but the effect is caused by the innate spirit of bodies which soaks up bodily moisture and escapes with it, and by the ambient air which multiplies itself on the innate spirits and juices of the body and preys on them. (OFB XII.164-5)

The "innate spirit," which is the same as the mortual spirit, induces the drying effect commonly called age. Compared with other drying agents such as fire and air, age dries thoroughly "but very slowly,

as happens in all bodies dried out by lapse of time (provided they are not cut off by putrefaction first)" (OFB XII.164-5).

In Bacon's view, most men have not noted little about desiccation, let alone age. They have behaved, rather, "like owls," which "see keenly in the darkness of their own notions, but blindly in the daylight of experience." Juxtaposing verbs of speech and perception, Bacon writes that such men "speak of the elementary quality of dryness, of desiccants, of the natural periods of bodies by which they are corrupted and consumed; but in the meantime of the beginnings, intermediate, and final phases of desiccation and consumption they observe nothing that matters" (OFB XII.172-3). In other words, desiccation is a latent process, requiring for its discovery closer observation and sounder reasoning than textbooks provide.

Properly understood, desiccation builds upon the process of consumption. It begins with a third stage, contraction. After attenuation by and escape of mortual spirit there follows "the contraction of the grosser parts as soon as the spirit has gone out." This third action represents "desiccation and hardening" proper because, Bacon adds, the first two actions "only consume." Once again, because contraction depends upon the escape of spirit into the air, the spirit he means here is mortual, not vital (OFB XII.172-3). Desiccation occurs when the grosser parts left behind when mortual spirit escapes into air draw together.

Bacon elaborates each stage of the consumption-desiccation process. During the first step, attenuation, spirit (mortual or vital) thins "whatever it finds in the surrounding body that it can digest, work up, and convert into itself." Such substances it "alters, tames, and multiplies itself on," generating new spirit. Bacon submits as evidence of this first step in consumption "that bodies dried thoroughly lose weight, become hollow, porous, and resonant inside." By "bodies," of course, he does not mean plant, animal, or human bodies necessarily but "every tangible body" although, in the case of vital spirit, the containing body would have to take one of those more complex forms. He reasons that, because spirits when enclosed in larger bodies actually make those bodies lighter, not heavier (an axiom he takes as "perfectly certain"), the resulting loss of weight in bodies thoroughly

dried must be from the conversion into spirit of "moisture and juice of the body," which do have weight (OFB XII.172-5).

For the escape of spirit, Bacon notes direct, sensible evidence, too: "visible vapors and delectable smells." Or at least, such evidence exists when the escape happens "all at once." In the case of age, where it happens "gradually," it also happens "imperceptibly." Nonetheless, Bacon affirms, the escape through age "is still the same thing" as the sudden escape perceived through vapors and smells (OFB XII.174-5).

The third and final action, the contraction of the parts left behind, which is desiccation proper, Bacon admits to be "a little more obscure but just as certain." Here Bacon makes frequent references to inanimate and dead objects in order to elucidate his point. Among them, he notices three phenomena which occur upon the departure of spirit. One is that grosser bodies "become manifestly shrunken and fill less space," such as nuts that no longer fill their shells, wooden planks that no longer fill the spaces assigned them, and bowls that crack. In those examples, contraction in one place leaves gaps somewhere else. The second phenomenon is the formation of wrinkles, which emerge when "what gets contracted at the edges gets raised up in the middle," as in "paper, old vellum, and in animal skin, and in the rind of softer cheese." The third is the "crumpling" [*Complicationes*] produced in objects such as vellum, paper, and leaves when they experience rapid drying by fire, which in addition to wrinkles causes things to be "tangled up, turn in, and as it were, roll up on themselves." Bacon opposes rapid drying by fire to the slow drying of age, which tends to produce only wrinkles (OFB XII.174-5).

As the comparisons above illustrate, the human body is just one tangible object undergoing desiccation. Desiccation affects all tangibles on the surface of the earth. The natural dissolution of the human body proceeds in large measure from something that every non-living thing also exhibits. Hence, Bacon feels justified performing analysis of desiccation through objects as far removed from human bodies as wooden planks and cheese rinds. His comparison runs the risk of making his study

sound trifling, but, as he so often protests, natural science must investigate the low along with the high; in fact, the understanding of the low can improve the understanding of the high.

Perhaps because of the remedial aim of *The History of Life and Death*, its second inquiry (on desiccation of natures durable) concentrates on inanimate objects with some solidity to them, for their structures more closely resemble the structures of human bodies. He largely ignores liquid or highly volatile substances that upon desiccation evaporate, leaving living little or no tangible substances behind. What interests Bacon about desiccation is what actually defines it for him, the behavior of the grosser parts after they are abandoned by mortual spirit.

Desiccation, however, is only one of four processes performed by mortual or innate spirit as it tries to escape tangible substances. Attempting to break free of its grosser captors, mortual spirit also can induce liquefaction, putrefaction, or vivification.

After Canon, 3 titled "Spirit given out desiccates; spirit held in and labouring within either liquefies, putrefies, or vivifies," Bacon unpacks each of these four processes. Desiccation, or "arefaction," is

> not properly speaking a work of the spirit but of the grosser parts once the spirit has been given off; for then the parts contract in on themselves, partly to avoid a vacuum and partly by the coming together of homogeneous substances, as is evident in all things which dry out with age, and in drier bodies desiccated by fire, like bricks, coals, and loaves.

Unlike desiccation, liquefaction is

> the work of the spirits alone, and it happens only when stimulated by heat, for then the spirits, expanding but not yet going out, insinuate and spread themselves among the grosser parts, and make them soft and molten, as in metals and wax. For metals and other tough bodies are good at constraining the spirit by stopping it getting out when it is stimulated.

Putrefaction, on the other hand, is

> the combined work of the spirits and grosser parts. For when the spirit (which contained and curbed parts of the thing) has in part escaped and in part grown weak, all things are dissolved, and are reduced to their heterogeneous parts or (if you like) their elements; for whatever spirit that existed in the body gathers itself together (whence the putrefied bodies begin to smell nasty), and the oily parts come together (whence putrefied bodies have a degree of smoothness and greasiness); the watery

> parts also come together, as do the dregs (whence comes the confusion of putrefied bodies).

Lastly, vivification also is

> the combined work of the spirit and grosser parts, but in a quite different way. For the spirit is completely kept in, and swells up and moves about locally, while the grosser parts are not dissolved but follow the motion of the spirit, and that drives them as if by a breeze, and forces them into various shapes, and that cause this generation and organization. Thus vivification always happens in matter tenacious and sticky, and at the same time pliant and soft, so that there is at once a keeping back of the spirit, and a gentle yielding of the parts according as the spirit fashions them. And this we see in the matter of all things, vegetable as well as animal, be they generated from putrefaction or from seed; for in all these things we most plainly see matter which is hard to break through but easy to yield. (OFB XII.350-2)

The four processes of spirit—desiccation, liquefaction, putrefaction, and vivification—lie on a dynamic continuum. Basic to each process is the spirit's struggle to attenuate the grosser parts and escape them. Which process occurs depends upon the strength of the spirit and the pliability of the grosser parts. Heat and cold affect both sides of the struggle. To see how Bacon thinks they each affect the spirits and the grosser parts we must consider his accounts of heat and cold given in other texts, but here is a brief synopsis. Moderate heat can make spirits robust. More intense heat can make them sharp. Either way, heat makes them more mobile and aggressive. It also dilates and thins spirits and can have a similar effect on the grosser parts. But heat does not always lead to the rarefaction of the grosser parts, just sometimes. Conversely, cold always condenses both spirits and grosser parts. By condensing the spirits, cold also slows and subdues them.

Let us look at each of the four processes individually, starting with the one most clearly relevant to senescence, desiccation. Desiccation differs from the other three processes because in desiccation the mortual spirit escapes the tangible body altogether whereas in the other three processes it remains either wholly or partly inside. Heat promotes consumption and desiccation in two ways. It expands and invigorates the mortual spirit, and it thins the grosser parts, thus opening more pathways for spirit's escape. Neither heat nor spirit, however, necessarily causes desiccation. Instead, cold does. "Of all things," Bacon writes in his inquiry of desiccation, "cold has the greatest capacity to dry things, for desiccation takes place with contraction, which is the particular work of

cold" (OFB XII.164-5). As Bacon observes in *The History of Dense and Rare*, contraction, or condensation, is the proper and invariable effect of cold. Heat, on the other hand, may either contract or dilate tangible objects, depending on what happens to the enclosed spirit, which it always expands (SEH II.303, V.398-9). In the case of consumption and desiccation, the expanded spirit escapes, allowing the grosser parts to draw together, either because their homogeneity attracts them or because their common aversion to vacuum forces them together. Hence, although desiccation is a process of the spirit, it is more directly an effect of the grosser parts, because it denotes the contraction occurring after the escape of spirit.

In liquefaction, unlike in desiccation, the mortual spirit remains totally within the surrounding body. Furthermore, as Bacon notes in *The History of Dense and Rare*, liquefaction begins with the expansion of that spirit whereas all other kinds of dissolution begin with the expansion of the grosser parts, which enlarges the space needed for the spirit to move about. Thus, Bacon considers liquefaction the proper work of the mortual spirit alone (SEH II.303, V.399). Heat contributes to liquefaction by directly exciting and expanding it. The mortual spirit remains inside the tangible body, nonetheless, where, as in consumption and desiccation, it attenuates the grosser parts, but without escaping their confines. Therefore, when liquefying, heat can be seen to dilate and soften tangible objects, just as when desiccating it can be seen to condense and harden them. The difference is that "the emission of the spirit contracts and indurates the body" while "the detention of the spirit intenerates and melts it" (SEH II.303, V.398).

Putrefaction, another kind of dissolution, bears close resemblance to desiccation for a couple of reasons. One, it results when the mortual spirit partially, but not fully, escapes a body. In liquefaction and vivification, by contrast, the spirit remains within a body. In addition, both desiccation and putrefaction involve homogeneous substances, a point that will become more significant in a moment.

In *Sylva Sylvarum*, Bacon explains that in putrefying bodies the innate spirit nearly succeeds in escaping but gets caught at the edges, where it weakens (SEH II.451). Losing heat and tenuity, it

allows homogeneous substances to pull closer together and heterogeneous substances to drift apart. Bacon considers putrefaction a combined work of the spirit and grosser parts, presumably because the spirit has enough power to manage a near-escape and to prevent the kind of contraction that marks desiccation but not enough to prevent the re-arrangement induced by the actions of the grosser parts themselves.

As another combined work, vivification resembles putrefaction, except that the spirit is less propulsive or the grosser parts less resistant, or both. To a point, it also resembles liquefaction, for here too the spirit remains wholly within the surrounding body. Vivification differs from liquefaction because of the consistency of the grosser parts in which the spirit finds itself. To enable vivification, the grosser parts must be "tenacious and sticky" as well as "pliant and soft." In such a medium, the spirit can move about "locally," yet the grosser parts "are not dissolved," as they are in liquefaction. Instead, they "follow the motion of the spirit," which then can generate and organize living things. One might expect Bacon to insert something here about whether and how the mortual spirit can transform into vital spirit, but he does not. Even in *Sylva Sylvarum,* where he discusses palingenesis in some detail, he leaves the subject of the origins of vital spirit shrouded in mystery. As I explain in the final chapter of Part One, that is a striking gap left in Bacon's theory of life.

It would seem that living things function best while the spirit remains within the process of vivification, for the other three processes represent types of dissolution. Thus, things are in a state best adapted to life when their gross parts and spirits maintain just the right degrees of density and rarity and just the right degrees of heat. Among the different structures and organs of various plants and animals, those right degrees might vary; however, Bacon upholds broad rules. As we just saw, the grosser parts must keep a density at once tenacious yet pliant. Not surprisingly, Bacon suggests that the right degree is a thick kind of oil, one of the two kinds of most durable substances. The other kind, hard substances such as metals and minerals, resist the spirit too effectively and do not yield (OFB XII.286-7). The spirits also must be able to expand and move locally but not stretch so thin that they pierce and undermine the gross parts. On the other hand, they must not be compressed as

much as the spirits of metals and minerals. In *The History of Dense and Rare*, Bacon asserts that the two most potent agents of condensation and rarefaction are cold and heat (SEH II.303, V.399). By and large, changes in temperature affect the functions of living things by altering the density of the grosser parts and the spirits. Too high a heat can rarefy the gross parts too much, as too much cold can condense them too much. Similarly, a heat that is too strong dilates spirits until they sharpen. It is better for the spirit's heat to be robust rather than sharp; a more robust heat arises when the spirit is also somewhat congealed (OFB XII.356-9). As spirit should not be overly compacted, however, so also it must not be overly chilled.

Within a living creature, when the heat and cold or density and rarity of a part change enough, that part declines from its best state. From a state appropriate for vivification, it enters states of dissolution, primarily either desiccation or putrescence. Of the two, desiccation is the more important for senescence and the prolongation of life. Nonetheless, Bacon posits that an understanding of putrescence is important to learning about health generally, because putrescence induces illness. Among other things, when putrescence occurs within organs, it hampers their functions. For Bacon, putrescence and desiccation are akin because in each the near or full exit of the mortual spirit has parallel consequences for the grosser parts.

In the *Novum Organum*, putrescence and desiccation are key examples of something that he calls the Motion of Lesser Congregation. The Motion of Lesser Congregation is the eighth of nineteen motions of real bodies expounded in Aphorism 48 of Book Two. All such motions represent actions innate to bodies where "bodies" denotes sometimes the smallest particles of matter and sometimes larger and more perceptible composites. The motions fall into two broad categories, those of conservation and those of propagation. The seventh and preceding motion that Bacon explicates, the Motion of Greater Congregation, is the tendency demonstrated by all bodies to be "carried towards masses of a like nature to themselves: heavy things to the globe of the earth, light things to the surrounding heaven." The Motion of Lesser Congregation, on the other hand, is that "whereby homogeneous parts in any body separate themselves form the heterogeneous, and congregate

together." In other words, whereas the Motion of Greater Congregation happens between bodies, the Motion of Lesser Congregation happens within a body. Still, that assessment is not quite right either, for in the latter case the homogeneous and heterogeneous substances are themselves bodies within a larger containing body. Both motions represent attractions. The Motion of Lesser Congregation, however, refers to the attraction between like bodies contained within a larger composite. The attraction undermines that composition as the various parts re-arrange themselves according to their more basic sympathies. As Bacon puts it, "substances unite that are bound together entirely by a real similarity, and flow as it were into one." When dominant, therefore, the Motion of Lesser Congregation brings about the dissolution of a composite body. Bacon avers that the motion is found "in all compound bodies" [*omnibus corporibus compositis*]; the only reason we do not see it operating in every compound is that it is "bound and reined in by other appetites and compulsions of bodies, which disturb that coming together."

Although I cannot find an explicit statement of this, I believe that when Bacon speaks of homogeneous and heterogeneous substances he alludes once again to those two great families, the inflammable and the flame-resistant. If so, homogeneous substances are those that fall into the same family, and heterogeneous substances are those that fall into opposite families. Consequently, all homogeneous, inflammable substances would have something in common with flame and oil whereas all homogeneous, flame-resistant substances would have something in common with air and water.

We can see evidence of Bacon's thoughts along these lines when he discusses salt. In *Thema Coeli*, he characterizes salt as hybrid tangible, analogous in the pneumatic column with spirit, which is a hybrid of flame and air. Salt consists of both inflammable and flame-resistant substances (OFB VI.172-3). In the *Novum Organum*, however, Bacon reveals that salt coheres by virtue of the "fierce" spirit within it. Salt serves as Bacon's chief example of "the restraint of a dominating body," in this case spirit, which can overcome the Motion of Lesser Congregation (NO II.48).

The mortual spirit is one of three things noted by Bacon that can prevent the Motion of Lesser Congregation and thereby keep heterogeneous bodies together in spite of their more powerful

attraction to homogeneous bodies nearby (the Motion of Lesser Congregation) and in spite of their repulsion to those heterogeneous ones (the Motion of Want). The other two preventatives are the torpor of certain gross bodies themselves and external motion, such as the shaking that mixes stratified liquids. The mortual spirit, according to Bacon, behaves in other composite things in a manner similar to that which it shows in salt, but perhaps not always with equal potency. Earlier it was said that in Bacon's view all tangible objects at the surface of the earth are mixed, in the sense that they comprise both gross parts and spirits. But often they are mixed in another sense too, for the grosser parts themselves may be compounded of homogeneous and heterogeneous substances. Being both flamy and airy, mortual spirit belongs to both families and neither. It is at once homogeneous and heterogeneous with every kind of gross body. For that reason, as well as for its extreme tenuity, Bacon considers spirit to play a crucial role in the coherence of composites. In addition to salt, he offers the examples of blood and urine. Blood and urine each is a mixture, consisting of different sets of homogeneous substances that nevertheless remain separated "because of the restraint placed on them" by the spirit. Bacon theorizes that "as long as those bodies are filled with the active spirit…the homogeneous parts do not come together." While vigorous and replete, the mortual spirit, "like a lord of the whole, regulates and holds in check their several parts, of whatever kind they are." (NO II.48).

Mortual spirit enables Bacon to explain how heterogeneous parts can cohere in composite bodies. Likewise, it enables him to explain how those composites can dissolve back into their sets of homogeneous components. Bacon continues to elaborate the example of blood and urine, observing that once the spirit "has evaporated, or been choked by cold, the parts, freed from the restraint, then come together in accordance with their natural desire." Whether removed by heat or quelled by cold, a diminished spirit allows for the homogeneous parts to collect again. They collect, Bacon insists, "through friendship" [*per amicitiam*], which distinguishes the Motion of Lesser Congregation, and not just through enmity to the heterogeneous parts or from an aversion to vacuum (NO II.48).

Putrefaction and desiccation occur through the resolution of gross composites into their homogenous parts. Although in the *Novum Organum* Bacon notes that putrefaction results when the

cessation of an external force such as shaking allows homogeneous parts to unite, in *The History of Life and Death* and *Silva Silvarum* he limns putrefaction without mention of an external force. It can be brought about by the enervation of spirit alone. When spirit lacks the power sufficient to drive it all the way through the boundary of the tangible object enclosing it, the homogeneous parts are able to draw closer together but not perfectly unite, whence, Bacon supposes, arise the stenches and greasiness of putrefying things. More germane to senescence, desiccation proceeds from the assembly of homogeneous parts after the mortual spirit escapes totally. When expounding the Motion of Lesser Congregation, Bacon attaches "hardening and drying" as another example. He opines that desiccation arises primarily from "this motion of friendship and union." "For," he explains, "after the spirit, or moisture turned into spirit, has escaped from any more porous body, such as wood, bone, and parchment, the denser parts contract and unite with increased effort" (NO II.48).

In his illustration of hardening and drying, Bacon's use of the materials wood and parchment recalls his inquiry of desiccation in *The History of Life and Death*. More interestingly, his use of bone recalls the passage from the Preface of that work wherein he elucidates the torment of Mezentius (the more reparable parts of a living creature dying in the embrace of the less reparable). Bones are among the less reparable parts: *Membranae, & Tunicae omnes, Nervi, Arteriae, Venae, Ossa, Cartilagines, etiam Viscera pleraque, denique Organica fere omnia*. In each passage, Bacon employs similar language. In the *Novum Organum*, bone is an example of "more porous bodies" [*corpore porosiore*]; in the Preface to *The History of Life and Death*, the less reparable parts, including bone, are "the drier and more porous parts" [*quae sicciores, aut porosiores sunt partes*]. Looking at the case of bone and the way Bacon depicts the dissolution by drying, we can start to see how he envisages the self-destructive process by which senescence wrecks the workshop of the body. Bone dries over time as more and more of its mortual spirit, and of the moisture converted to spirit, is lost through consumption to the air. With the regulating and checking power of the spirit diminished or absent, the homogeneous parts within bone re-align and close up more tightly, drying the gross structure of bone.

Of course, the example of bone does not help explain very well the link between the hardness of the less reparable parts on the one hand and the degeneration of the more reparable parts on the other. Even in medical and hygienic texts of the sixteenth and seventeenth centuries, bone is thought to be largely for support and protection of other parts, not for alimentation.[26]

Still, we need not limit our analysis to bone. Some of the other less reparable parts named by Bacon have a clearer connection to the restorative process of a whole human body. Of special importance are the veins, the arteries, the viscera, and (almost all of) the organs. Such parts dry in the way bone dries, by consumption followed by the contraction of their homogeneous parts. We might wonder how consumption could affect them since desiccation requires the action of the air and many of those parts lie buried beneath the flesh and well removed from the outside air. But like many other early-modern medical writers, Bacon avers that the air can penetrate deep within the relatively porous bodies of plants and animals—and not just by way of the lungs. Even by transpiration of the skin, it can reach the less reparable parts.[27] As those parts dry, they gradually lose their strength. In particular, they gradually lose their ability to assimilate nutrients necessary for their own functioning. In Operation VIII of *The History of Life and Death* ("On the Last Act of Assimilation"), Bacon explains that all bodies have some desire to assimilate things but that the intensity of the desire increases in proportion to rarity: "Thin and pneumatic bodies, like flame, spirit, and air, do that [assimilate] lavishly and eagerly; on the other hand, ones whose mass is gross and tangible do so extremely weakly, because their desire to assimilate is curbed by the stronger desire for rest and immobility" (OFB XII.314-7). While drying, bodies condense and harden. Once hardened, the already drier viscera, organs, and blood vessels have more trouble assimilating the nutrients needed to

[26] Nonetheless, bone was thought to be a living part, capable of repair. According to, e.g., Avicenna and Jean Fernel, bone marrow is blood undergoing the slow process of conversion to the substance of bone. See Avicenna, *The Canon of Medicine*, trans. O. Cameron Gruner (London: Luzac and Co., 1930; reprint, Chicago: Kazi Publications, 1999), 55-56, and Jean Fernel, *Physiologia*, trans. John Forrester (Philadelphia: American Philosophical Society, 2003), 188-191.

[27] As evidence, Bacon's second operation to prolong life consists of excluding the air, in part by coverings and anointments. Like the innate spirit, the air is able to prey directly upon the juices of the body. See OFB XII.272-3.

repair themselves. It is difficult for them to soften again or, what amounts to the same thing, to rejuvenate. Without extraordinary measures in diet and bathing, they cannot regain the right degree of pliancy that each needs to absorb nutrients and to fulfill other functions of life.[28] Desiccation thus poses a severe problem for the elderly, as Bacon points out: "The harder a consistent body is, the greater is the heat needed to stimulate assimilation; and this is bad news for old men, for the parts are less yielding, and the heat feebler" (OFB XII.316-7).

Through the preceding analysis we can see how Bacon's physiology accounts for the hardening of the less reparable parts by desiccation, a process also affecting inanimate things. We also can see how desiccation wrecks the ability of those parts to assimilate. Yet, strangely, we still have yet to connect the inanimate side of Bacon's inquiry to the animate. The reason is that Bacon maintains that, like desiccation, assimilation belongs to all bodies, animate or inanimate. The condensation and hardening of the less reparable parts degrades their power to assimilate in a way similar to what it would do to objects not contained within an animate subject; it enlarges their torpor. Their torpor increases as the mortual spirit departs and the grosser parts constrict. But even the most gross, dense, and torpid of tangible objects, Bacon claims in the *Novum Organum*, still possesses a desire to assimilate. For example, clay exhibits "accretion" when set adjacent to stone (NO II.48). That desire shrinks, however, as things condense and their growing torpor restrains it. Thus, less reparable parts such as bone, blood vessels, and most organs lose their power of assimilation by the ubiquitous process of desiccation. Presumably, even the more reparable parts—spirit, blood, flesh, fat—lose something of that power, too, but could recover much more of it if the drying of the less reparable parts did not interfere with them.

To understand better the animate side of Bacon's inquiry, we have to figure out more precisely how the drying of the less reparable parts interferes with the actions of the more reparable. It is through the communication of the different parts that any plant or animal, including a human

[28] Bacon's prescriptions for baths and anointments are discussed in the next chapter.

being, shows itself to be an animate thing, an organic whole.[29] On this side of the inquiry, the animate, Bacon's ideas more consistently hew to those of early-modern medicine, for his conception of vital spirit, which is a key to the functioning of an animate creature, relies heavily on Galenic theories of native heat and medical spirits.

Living things, according to Bacon, assimilate more effectively than do non-living ones because of vital spirit. Although the parts of the human body might gradually lose their power to assimilate in a way somewhat similar to inanimate objects, the escape of mortual spirits contained in them does not account fully for their loss of power, because the mortual spirits alone do not enable them to assimilate. In Operation VIII, Bacon adds that

> The desire to assimilate, which is, as I have said, curbed, and made ineffective in a corporeal mass, is somewhat freed, stimulated, and eventually actuated by heat or spirit near by—which is the only reason why inanimate bodies do not assimilate whereas animate ones do. (OFB XII.316-7)

The sentence is admittedly confusing, coming immediately after the paragraph in which Bacon asserts that "all bodies" possess "some desire" [*Desiderio nonnullo*] to assimilate things that rest in contact with them. Now he claims that only animate bodies assimilate. What he appears to be getting at is that although all tangible things have a native drive for assimilation, only in animate ones does that drive predominate over the others that would restrain it. The most notable restraint is the torpor of density. Significantly, Bacon limits his speech here to what goes on "in a corporeal mass" [*in Mole corporea*]. Pneumatics, being highly refined, do assimilate; mortual spirit, for instance, digests moisture into more spirit, and the air then digests the mortual spirit into more air. Corporeal masses tend not to assimilate; that appetite is effectively shut down or strongly reduced by their density. In animate things, however, corporeal masses can assimilate because of the "heat or spirit near by."

This passage represents one of many in *The History of Life and Death* wherein Bacon muddies his ideas by leaving the spirit he intends ambiguous. Nevertheless, sometimes one can deduce which one he is speaking about from what he says elsewhere about the different kinds of

[29] I discuss this point further in the last chapter of Part Two.

spirit. Fortunately, this is one of those cases. Bacon refers to the spirit as that which resides "near by" [*in Proximo*], not as that which resides within. Mortuals spirits reside within inanimate things, or within corporeal masses. Vital spirits remain outside corporeal masses, instead keeping to channels and enjoying their own continuity. According to Bacon, vital spirit draws near to but does not enter the tangible stuff that traps mortual spirit yet, being more fiery than mortual spirit, supplies to that stuff a more robust but still delicate heat that frees, stimulates, and actuates its latent desire to assimilate other gross material.

Above, Bacon was quoted as saying that old men suffer difficulties assimilating because when old "the parts are less yielding, and the heat feebler." Desiccation causes the parts to become more tenacious and less yielding [*obstinatiores*], but the heat grows feebler [*imbecillior*] for another reason. Namely, the desiccated viscera, organs, and vessels fail to nourish the vital spirits as richly as they once did, and thus the heat emanating from the vital spirits declines. Basically, Bacon depicts senescence as a negative feedback loop. As they dry, the less reparable parts can no longer nourish the vital spirit adequately and therefore abate it; losing strength, the vital spirit, in turn, further reduces the ability of the less reparable parts to assimilate nutrients and thereby repair themselves; and the further reduction of their power compounds their impairment of the vital spirit, which diminishes the vital spirit's benefit returning to them. The process continues until death results.

To understand the process better, we must look more closely at what Bacon says about vital spirits and their operations within the human body. For Bacon, "vital spirit" does not denote quite the same thing that it does for classical medicine. In classical medicine, it is one of three medical spirits, the one responsible for instigating sense, locomotion, and the works of the heart, vessels, and lungs. In Bacon's physiology, "vital spirit" comprehends all three medical spirits. It takes on the duties of the conventional vital spirit as well as those of the vegetable and animal spirits. Unlike the medical spirits, it also has just one seat, in the cerebrum. It also undergoes a slightly different process of generation. Tellingly, Bacon never deploys the proverbial definition of the bodily spirits. He does

not define vital spirit as a refined emanation of the purest blood. Rather than emanate from the blood, vital spirit feeds upon the blood coursing through the arteries that enter the brain.

That being said, Bacon's concept of vital spirit corresponds with the traditional concept at a number of levels. It consists of something fiery and of something airy. And, as the medical spirits were often depicted as participating in *pneuma* in some mysterious way, Bacon's vital spirit has a mysterious and somewhat muddled relationship to mortual spirit. Most important, however, is the functions it executes within the human body. Like many of his predecessors and contemporaries, Bacon allies native heat with the body's spirits and posits that the work of the organs and other parts is accomplished through the combination of the structures of those parts and the spirits residing within them. As we saw, Bacon distinguishes vital from mortual spirit by the former's more fiery composition and its continuity within channels bored through the bodies of animals and plants. Being even more refined than mortual spirit, vital spirit exhibits three important properties. Because of its airy nature, it is prone to "easy and delicate receptions." Because of its flamy nature it proves capable of "noble and powerful motions" and other actions. Finally, because of its combination of two natures, it resists quick destruction, being neither "as evanescent as flame, nor yet as permanent as air" (OFB XII.376-7).

The vital spirit's special balance of airy and fiery substances catalyzes sensation and movement but also digestion and, to some degree, even thought. According to Bacon, the "natural actions" of the body properly spring from the structures of the organs, but only after the vital spirit first "whets and stimulates" them. Vital spirit is effectually a kind of heat, and when applied to the body's organs, it rouses desires, such as assimilation, typically restrained in grosser matter. "The vigour and presence of the vital spirit, as well as its heat," Bacon writes, propel the following functions: "attraction, retention, digestion, assimilation, separation, excretion, perspiration, and indeed the very sense itself" (OFB XII.353). He also assigns to vital spirits the duty of regulating the passions. In classical medicine, all these functions were associated with the vegetable and vital spirits and, correspondingly, with the two lower parts of the soul. For Bacon, vital spirit bears upon lower

orders of thinking, too, such as imagination. Like Ficino, he even supposes that it enables natural divination and fascination, the transmission of imaginations between persons (SEH I.607-609, IV.398-401).[30]

When examining the mortual spirit, we saw that Bacon takes its presence largely for granted. He does the same with the vital spirit. He assumes that what orchestrates the functions mentioned above must be some kind of spirit. As evidence of its debt to classical physiology, *The History of Life and Death* barely explains how vital spirits accomplish the life-sustaining activities that they perform. Of course, a big part of the reason for the lapse is the purpose of the text; *The History of Life and Death* seeks the practical knowledge to prolong life, which may not require knowledge of all the different faculties of the sensible soul. But Bacon's silence also indicates an estimation that current pneumatology is at least a serviceable starting-point in the area of vital faculties. His other texts, too, evince much less serious consideration of how precisely those faculties work. In *The History of Life and Death*, even when addressing the mechanics of reparation, he often defers to the less-than-demonstrable theories of received medicine to explain them.[31]

One place where he does not rehearse reigning medical theory is his analysis of vital spirit's third property, its endurance. Bacon's thinking here begins conventionally enough. Canon 32 reads, "Flame is an evanescent substance; air is permanent; the living spirit is a principle poised between those two" (OFB XII.376-7). Although Bacon affirms that the canon requires "deeper investigation and longer explanation" than presently possible, he explains that, just as the living spirit feeds on both water and oil, which do not join except when mixed, the air and flame yielded from them fashion a third thing that reduces the two extremities to a mean. As a consequence of the living spirit's dual nature, its duration is also a "compound thing" [*Res composita*], neither as "evanescent" [*Momentanea*] as flame nor as "permanent" [*fixa*] as air. But Bacon adds that its duration differs

[30] Bacon discusses natural divination and fascination in *Sylva Sylvarum* as well. For the influence of spirits, see especially SEH II.652-660.

[31] See, e.g., OFB XII.292-3, 300-1; and SEH I.609-10, IV.401-2.

more from that of transient flame than from air. Flame can be extinguished "by accident, i.e. by contraries and by destructive ambient bodies." Vital spirit, however, does not suffer from contraries and consumption "to the same extent" [*partier*]. Vital spirit can better resist both because while on the surface of the earth the bodies surrounding it have less kinship with it than, say, air does with mortual spirit. It dwells among "a lot of friendly and deferential" bodies, unlike flame, which survives as long as it remains inside another flame but ordinarily dies quickly because of its situation among unfriendly ones (OFB XII.336-7).

Bacon's analysis becomes more unusual, though still not wholly original, when he begins to differentiate the vital spirit from the soul. On the one hand, he objects to those who argue that because the vital spirit is a kind of flame it has no more permanence than does ordinary flame and therefore, like flame, must be "perpetually generated and extinguished" (OFB XII.336-7). The argument to which he objects was that made by classical medicine: spirits emanate from the blood and pass through the body and into the air. On the other hand, he also objects to those who would render to the spirit of the human body the permanence of the soul—one of several "heathenish and heretical fabrications" arising from the confusion of the so-called natural spirit with the soul. Such, he says, is the belief of theosophers who posit metempsychosis. According to Bacon, then, the spirit in plants and animals can endure longer than what most physicians think but not as long as theosophers think. The more unusual and possibly dangerous tenet emerging is that the vital spirit has some permanence to it, like soul.

Although Bacon does not repeat the exact same mistake as the theosophers whom he censures, his stance on the relationship between vital spirit and soul draws him closer to their side. As D.P. Walker observed several decades ago, Bacon explicitly follows the lead of Telesio and Donio when he replaces the Scholastic vegetable and animal souls with his peculiar concept of vital spirit. Donio, who was condemned and imprisoned by the Church of Rome, assigned to corporeal spirits

many of the functions traditionally assigned to the incorporeal soul.[32] In Book IV of *De Augmentis*, Bacon judges knowledge of both the nature and the faculties of the soul as deficient. Scholastic definitions of the soul as "ultimate act" or "form of the body" he ridicules as "toys of logic," because, he asserts, the sensible soul shared with brutes "must clearly be regarded as a corporeal substance."[33] His brief analysis of the sensible soul echoes his statements from *The History of Life and Death*. This corporeal substance is

> attenuated and made invisible by heat; a breath (I say) compounded of the natures of flame and air, having the softness of air to receive impressions, and the vigour of fire to propagate its action; nourished partly by oily and partly by watery substances; clothed with the body, and in perfect animals residing chiefly in the head, running along the nerves, and refreshed by the spiritous blood of the arteries. (SEH I.606, IV.398)

In brutes, this corporeal or sensible soul is "the principal soul" which takes the body as its instrument, whereas in human beings it is "itself only the instrument of the rational soul." Bacon avows that as such the sensible soul "may be more fitly termed not soul, but spirit" (SEH I.607, IV.398). Knowledge of the soul will not improve until investigators begin to study it as a real substance. Consequently, he complains that the faculties commonly allotted to the sensible soul or spirit have "not as yet been diligently inquired or handled," because no one has investigated how "the compressions, dilations, and agitations of the spirit (which is doubtless the source of motion) can sway, excite, or impel the corporeal or gross mass of the parts" (SEH I.609-10, IV.401). The main obstacle blocking that approach has always been the conception of the soul "as a function [rather] than as a substance" (SEH I.609-10, IV.401).

Bacon depicts the vital spirit as substitute for the soul if by "soul" one refers to the two lower forms, the vegetable and the animal. For Bacon still distinguishes a rational soul that is "incorporeal and divine" (OFB XII.376-7). He claims that as the body is the instrument of the spirit, so is the

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[32] D.P. Walker, "Francis Bacon and *Spiritus*" in *Science, Medicine, and Society in the Renaissance*, ed. Allen G. Debus (New York: Science History Publications, 1972), 124-5.

[33] Incidentally, these conventional definitions are reiterated by Melanchthon.

spirit "the instrument of the rational soul" (OFB XII.376-7). The rational soul, furthermore, does not exist by traduction and does not suffer either repair or death (OFB XII.332-3).

Invested with many soul-like qualities, the vital spirit persists in the same state so long as it is properly nurtured. Bacon's analysis of the vital spirit's endurance puts emphasis on something that differentiates his conception from the spirits of traditional medicine. Whereas traditional physiology posited that medical spirits were transient emanations constantly manufactured by and then leaked from the human body, Bacon maintains that the vital spirit sticks to its channels, is not easily consumed, and refuses transpiration into the surrounding air. It does not come and go. Nonetheless, his ideas about how the vital spirit is sustained harkens back to precedent theories, even reverting to the commonplace life-flame metaphor.

In the inquiry titled "Death's Anterooms" [*Atriola Mortis*], Bacon declares the vital spirit requires three things in order to subsist: "suitable motion" [*Motu commodo*], "moderate coolness" [*Refrigerio temperato*], and "appropriate aliment" [*Alimento idoneo*] (OFB XII.328-9). These are the three "lacks" [*Indigentiae*] that ultimately cause death, the "things that befall the moribund during the critical instants just before and just after death" (OFB XII.328-9). As Graham Rees suggests in his notes to this inquiry, Bacon's list replicates the traditional requirements of the native heat designated by natural philosophers and medical writers as early as Aristotle.[34] Bacon discriminates simple flame from vital spirit over one of the necessary conditions, cooling. Like Aristotle and most medical writers after him, Bacon supposes that respiration serves to cool animal bodies.[35] Somewhat more idiosyncratically, though, he accents the difference between flame and the living spirit of animals: "But flame seems to need only two of these, namely motion and aliment; for flame is a simple substance, spirit a composite one, such that if it gets a little nearer to the flamy nature it destroys itself" (OFB XII.328-9). To preserve itself, vital spirit cannot overheat and become too much like

[34] See OFB XII.452-3.

[35] Of course, in traditional medicine, respiration also brought nutrients to the spirits.

flame, but must be cooled. Cooling safeguards the airy part of its nature. Simple flame, however, needs only room to move and fuel, not cooling.

Early moderns, it is often remarked, accredited analogy as an instrument of knowledge much more than we who live in a post-Enlightenment age. A principal means they employed to conceive of the interior phenomena of the human body was to compare the way the same materials that make up the body behave in the outside world. For instance, one can learn something about the medical spirits by observing the winds, or something about the humors by observing the actions of waters. The commonplace analogy between the heat of life and flame demonstrates that habit of thinking. Despite his vituperations against radical moisture theory, Bacon exhibits the tendency when he sets about analyzing the sustenance of the vital spirit. It is especially palpable in his exposition of the vital spirit's first and third preconditions. Like flame, vital spirit goes out when its movement is too tightly constricted. Some of the things inducing the vital spirit's clotting and immobility are the inundation of blood or phlegm in the ventricles of the brain; a violent "contusion" to the head; opium and narcotics; a "toxic vapor" with such precise antipathy that the vital spirit recoils from it; the abundance of vapors caused by "extreme drunkenness or overeating"; and contracting passions such as "extreme grief and fear" (OFB XII.328-331). Like flame, the vital spirit also dies when its fuel, or aliment, is denied or vitiated. To preserve its motion, the vital spirit needs free room within the brain and nerves, just as, to renew itself, it needs aliment every day (OFB XII.336-7).

The vital spirit behaves less like flame, Bacon reasons, not only for its desire for coolness but also for its death by dilation. In contrast to flame, it dies when its movement is too great, not just too narrow. An analogy to the larger world, however, still operates here. Bacon seems to deduce this more peculiar quality from what he observes about the interactions of flame and air. In a covered lamp, the dilated air "cramps the flame, diminishes it, and puts it out" (OFB 328-9). Thus the vital spirit is akin not so much to a flame bare and free as to a candle flame within a glass. In the human body, dilations of vital spirit wrought by expansive passions such as "great and sudden joys" can

destroy it, as can "great evacuations" such as a dropsy, whereby all fluids and pneumatics in the body spread so as to avert a vacuum (OFB XII.330-1).

The need for cooling is manifest, Bacon thinks, in deaths by suffocation. He infers the cooling effect of respiration from premises that look simple now: suffocation must induce overheating; otherwise, people would not die from the hot air of coals and baths (OFB XII.330-1). The human body requires an intake of breath about every twenty seconds to forestall overheating (OFB XII.330-1). Although divergent from flame in its need for cooling, vital spirit behaves like flame nonetheless when a fever produced from putrefied humors overwhelms and extinguishes it, as a larger flame swallows a lesser (OFB XII.332-3). One of the most important means of cooling according to Bacon, sleep, has one effect on the vital spirits and another on the rest of the human body. Whereas the motion of waking life "attenuates and rarefies the [vital] spirit, and sharpens and intensifies its heat," sleep "calms and subdues its motion and bustling." Deprived of sleep, vital spirits overheat and die. In sleep, the vital spirits coalesce too—not surprising, given Bacon's assertions that cold condenses. Sleep is "nothing other than the living spirit's withdrawal into itself" (OFB XII.334-5). Sleep, however, encourages the activities of the mortual spirits and of the parts and "all motion to the circumference of the body," by which is meant the passage of nutriment from the viscera to the extremities (OFB XII.332-3). Why it acts differently on mortual spirits is unclear. But once again Bacon reasons by analogy: sleep assists the "gentle motion" of digestion, by removing other agitations that tend to upset it, just as milk separates into cream and whey only when still (OFB XII.316-7).

The third lack, of aliment, most directly concerns senescence. Bacon's discussion of this want opens with a confusing paragraph, parts of which I already have quoted, wherein he elaborates the facile belief that alimentary repair "seems" [*videtur*] to pertain more to the parts of the body than to the vital spirit. The belief emerges from the confusion of the medical spirits with the rational soul. Bacon postulates, conjecturally, that "one may readily believe" [*Facile enim quis credat*] that "the living spirit persists in its essential integrity and not successively or by renovation" because of a

supposed resemblance between it and the immortal soul (OFB XII.332-3). However, he himself insists that the vital spirit, distinct from the rational soul, undergoes repair and renovation although he too disavows that it undergoes successions of generation and extinction.[36] As mentioned before, Bacon contradicts the prevailing pneumatology when he stresses that the vital spirit suffers repair instead of being continually exchanged with the pneumatic bodies of the outer world. According to Bacon, the vital spirit feeds upon arterial blood entering the ventricles of the brain rather than emanates from the blood as a kind of ultra-thin vapor that cycles back into the surrounding air. In other words, the vital spirit, not just the bodily parts, needs repair. Like the framing body itself, the vital spirit deteriorates if not adequately fed. Without nourishment, it experiences a senescence of its own. Over time it becomes more thin and rare, which makes its heat sharper [*acrior*]. At the right degree of thickness and congealment, the vital spirit produces a heat that is robust but not sharp. A robust heat promotes the bodily functions stimulated by the vital spirit. A sharp heat impedes them and can even damage parts of the body through excessive consumption.

Bacon infers vital spirit's need of aliment, as well its contribution to consumption, from the disparate rates of "wasting" [*Absumptionem*] seen in the human body when dead and when living. Echoing a sentence in the Preface, he observes that a corpse endures "for some time without obvious wasting" but that, if not nourished, a human being cannot live much beyond three days (OFB XII.334-5). "This indicates," he continues, "that wasting is the work of the living spirit which either repairs itself, or puts the parts in a position where they must repair themselves, or both." Clear to Bacon from this evidence is that the human body experiences more rapid consumption while alive than it does while dead. Also clear to him is that the vital spirit must have something to do with the increased rate. Less clear to him is what the vital spirit does to lead to the increased rate. Does the

[36] Graham Rees misinterprets this paragraph in his notes, construing a contradiction between what Bacon says here and a later comment that vital spirit does not exist in identity but by repair. By mistake, Rees interprets this whole paragraph as Bacon's own opinion. The first and last sentences, however, are not. When Bacon writes that "one may readily believe" that vital spirit persists in identity, he puts the verb [*credat*] in the subjunctive. One may believe it, but it is not necessarily true. See OFB XII.453.

increased rate follow from the consumption performed by the vital spirit in order to repair itself directly? Or does it follow from a consumption performed by the parts, which must repair themselves more amply because of the addition of vital spirit consuming them? Or does it follow from both? Bacon does not answer those questions decisively. The problem of what ultimately causes living things to waste faster interests him less here than does the necessity of the vital spirit to repair itself, something he affirms more strongly. According to Bacon, the vital spirit consumes arterial blood even if that action by itself cannot account for the quickness with which living things die when not nourished. To justify his point, he reasons by analogy with the human body as a whole. One might suppose that by consuming arterial blood the vital spirits would grow to an ungainly size and number if they themselves are not consumed, or do not perish and regenerate successively. But Bacon argues that, just as the human body absorbs far more nutriment than is added to its mass, and does so without becoming overburdened, "in the same way, although the vital spirit gets repaired, its amount does not suffer undue increase" (OFB XII.334-5).

Likely, Bacon was puzzled by the ultimate source of a living thing's more rapid deterioration because of a conflict between two theoretical principles. First, that in consumption material from one body transfers to another. Second, that, however much it consumes, the vital spirit does not increase appreciably in amount. Where does the material consumed by the vital spirit go if not into that spirit? And how can something so refined that does not appreciably increase in amount consume so much of living things as to make them waste away noticeably faster? If the spirit does not cause that effect directly, perhaps it does so indirectly, through the body's parts. Or perhaps it does so in both ways.

Using the analogy between the vital spirit and the human body that contains it, Bacon occludes the obvious dissimilarity evoked by the problem just encountered. The human body can soak up sizeable nutriment twice daily without commensurate enlargement because it loses the excess mass through waste and through consumption by the air. Bacon is no different from contemporaries and predecessors when he depicts the body as an open system, exchanging materials with its environment. The vital spirit, however, is mostly closed. It is not consumed by the air but is

relatively permanent. Therefore, its more or less constant amount cannot be explained by an emission of what it has consumed back into the outside environment. Nevertheless, Bacon asserts that the vital spirit does need repair, which presupposes that it wastes away somehow, as already indicated by his claim that without good nourishment it thins and sharpens. How wasting can happen without consumption by another entity such as the air is mystifying within the parameters of Bacon's matter theory. It would seem impossible, unless Bacon tacitly supposes something that he never states, namely, that the spirits (mortual and vital, but especially vital) convert matter into heat, or, as we might say, convert mass into energy. Of course, Bacon was deeply intrigued by the phenomenon of heat, as evident in Book Two of the *Novum Organum*, and his analysis there is astute. But he never states that heat is a peculiar work of spirits, much less equates heat with spirit.[37] Still, in living things vital spirit is especially flamy, a governor of the body's heat and thereby of the body's operations. From classical to early modern natural philosophy, heat was seen as the motivator of the actions of animals and plants. Bacon realized that activity saps more nutriment than does quiescence. In the passage expounding the vital spirit's need of aliment, he writes that "just as sleep to some degree stands in for aliment, so by contrast exercise demands more of it" (OFB XII.334-5). In the vital spirit Bacon locates the ultimate need of aliment. For him, it is not simply that a person needs more food when he runs than when he sits still but that the vital spirit needs more food when he runs than when he sits still. Undoubtedly, Bacon thinks the increased need has something to do with the heat produced by the vital spirit, for exercise heats vital spirit whereas supply of the right nutriment cools it down.

To repair itself, the spirit needs nutriment, but, beyond that, it needs appropriate nutriment. The right nutriment is of a grade already close to the vital spirit, that is, "of a kind so prepared and furnished that the spirit can work on it" (OFB XII.334-5). Bacon uses a familiar analogy to explain: "For a candlewick cannot keep a flame going in the absence of wax, and men cannot live on salad

[37] Bacon's "first vintage" of heat defines it as "an expansive motion, checked, and exerting itself through the smaller parts of bodies" (NO II.20).

alone" (OFB XII.334-5). Actually, Bacon deploys two analogies or two pieces of evidence here, one from the outside world and one from the whole human body. By the first comparison, Bacon argues that, like a candle feeding on wax, vital spirit needs nourishment proximate in kind, which presumably means something oily. With the second, he assumes that, for his own sustenance, man needs to eat something besides plants; he also needs to eat flesh, because flesh is closer to his own composition than plants are.

Bacon's observation of the disparate rates of wasting between living and dead bodies relies upon two different senses of "*consumptio*" or "*adsumptio*." In the case of non-living things, wasting refers to the piecemeal loss of substance. It complements their persistence in identity. In the case of living things, wasting can refer to that but also to the gradual loss of organization. The latter complements their persistence through repair. When Bacon says that, while unnourished, living things waste away noticeably faster than non-living things—in about three days—he means that in about three days they die. They go from being living things to being non-living things. For a few days, the material of their bodies decreases faster than that of non-living bodies, but ultimately their dissolution is the dissolution of a living thing as a living thing. Living things possess a wholeness that non-living things lack. From the time of Aristotle's *Physics*, natural philosophers often employed a metaphor to depict the wholeness of living things in contrast to the wholeness of non-living ones, which was also a means of depicting Aristotelean and Scholastic "form." Non-living things are whole the way a pile of grain is a whole, which is not truly a whole at all but a mere accumulation of parts, whereas living things are whole the way a word is whole, a complex of letters and syllables that in their union make something new. When Bacon speaks about the rapid wasting of living things that want aliment, he means that their living wholeness is wasted until with death the combined meaning is lost. Non-living things, by contrast, waste away purely by consumption, the bit-by-bit removal of grains from the pile.

Nevertheless, Bacon associates both kinds of wasting or dissolution with living things, the impetus for the double-sided investigation in *The History of Life and Death*. The loss of grains from

the pile eventually causes the wholeness of living things to unravel. At the end of his descant upon vital spirit's need for aliment, he finally reveals what the repair of the spirit has to do with senescence:

> And this is what causes the atrophy of old age: that although flesh and blood are not absent, the spirit has been made so scarce and sparse, and both the juices and blood so worn out and intractable, that they cannot do the job of alimentation. (OFB XII.334-5)

Here Bacon connects both ends of the circuit, joining the two sides of natural dissolution, animate and inanimate. Responsible for delivering aliment are the flesh and the blood, among the more reparable parts enumerated in the Preface. As Bacon explains in earlier portions of the text, flesh—here almost elided with "juices" [*succus*], the thick, oily liquids suffusing flesh and many other parts as well—supplies much of the nutriment to the various parts. Blood supplies it to the flesh, to other parts, and to the vital spirits. As one grows old, the amounts of flesh and blood do not decrease. Instead, the flesh and blood themselves become "worn out" [*effoeti*] and "intractable" [*obstinati*]. The latter is the same word that Bacon uses in the passage about how in old age the heat becomes feebler and the parts "less yielding" [*obstinatiores*]. The flesh and blood are too weakened by the hardness of age to administer the gross materials needed for repair, and the vital spirit is too "scarce and sparse," or, better yet, too scant and rare [*paucus & rarus*], to stimulate that repair sufficiently. The vital spirit, however, has been reduced and thinned because of the poor quality of the blood supplying it. In other words, its aliment has become too distant in kind from its own substance. The lack of aliment for the vital spirit gradually wrecks the process of alimentation for the rest of the body, because now the individual parts no longer enjoy a vital spirit that is large enough and that emits a heat robust enough to incite the faculty of repair within them.

In living things such as humans, vital spirit links the animate and inanimate sides of natural dissolution. While the thinness and sharpness of the vital spirit degrades the process of repair by aliment, the vital spirit is made thin and sharp by the inanimate process of consumption and desiccation. The vital spirit is not consumed and desiccated directly. Rather, the organs concocting

the blood are. Yet the blood feeds the vital spirit. Dried by the inanimate process of consumption, the organs involved in repair enervate the vital spirit. Thus, ultimately, the vital spirit suffers from the inanimate process of consumption. For instance, Bacon warns that patients take precautions to ensure that the stomach does not become too hot. According to Bacon and previous medical tradition, concoction begins with the stomach, which Bacon dubs the *Paterfamilias* of the organs. The stomach loses strength if it becomes too hot. Weakened, it cannot refine food into the chyle that eventually produces blood (OFB XII.294-5).

The real problem, however, may lie in the liver. According to traditional medicine, the liver was the site of the blood's production. Bacon follows the tradition, averring that the most important hygienic treatments for the liver are the same as those for the blood. But the liver, he writes, can suffer from three kinds of more peculiar impairment, "parching" [*Torefactione*], "drying out" [*Desiccatione*], and "obstruction" [*Obstructione*]. The last occurs in dropsies [*Aquositates*], and Bacon considers it an intermittent disease. The first two, however, parching and desiccation, he says, are caused by creeping old age [*At reliqua duo etiam Senectus obrepens inducit*] (OFB XII.298-9). Previously, we saw the tribute Bacon pays to Telesio for his challenge to the conventional models of senescence. Unlike most Galenists, Telesio posited that after the prime of life the liver overheats and dries out. Here, Bacon seems to adapt Telesio's notion of the liver's overheating and desiccation, though not his corollary that the whole aged body grows hotter in correspondence. Instead, Bacon suggests that the desiccation of the liver brought about through heating and consumption spoils the production of blood, which gradually reduces the strength of the vital spirits, making their heat, and consequently the body's heat, finer and less robust.

Section (d): Conclusion

Now that we have discerned more clearly what two tracks of natural dissolution are, we can understand better why Bacon's theory of senescence is not a vital substance theory. According to vital substance theories such as the radical moisture theory of Bacon's time, senescence proceeds as

the amount of a substance necessary to vitality decreases. The decrease occurs necessarily from the activities of life, which consume the substance directly. First, the decrease induces a gradual decline in functioning. Finally, it causes death.

According to Bacon's theory, senescence proceeds as consumption and desiccation by mortual spirits and the air depletes various bodily parts of moisture. The same process occurs in non-living matter as well, and the moisture is vital or radical only in the sense that it keeps those parts conductive of the heat that stimulates their appetites and motions. It is not primigenial, specific to itself, or incapable of repair. Depending on original hardness, some parts dry out more rapidly than others, but consumption and desiccation affect all parts, not just a single substance. Furthermore, the mutuality of the parts involved in the long, manifold process of metabolism enables the decline of functioning and natural death. When dried, the organs responsible for digestion fail to concoct nutriment effectively, as the gross matter within them becomes more resistant. In particular, a dried liver produces inferior blood that cannot suitably nurture the vital spirits. Becoming smaller and thinner and less productive of heat because of malnourishment, the vital spirits then fail to stimulate adequately all other sites of repair in the body. The result is a vicious cycle of desiccation and faulty repair: the more severe the desiccation, the weaker the repair; the weaker the repair, the more severe the desiccation.

Overall, Bacon depicts senescence as a more intricate, mechanical, and complex process than did his predecessors. When he censures the radical moisture theory in the Preface of *The History of Life and Death*, he asserts that living things are potentially everlasting if the means of repair do not break down. His depiction of senescence shifts the source of natural dissolution away from a certain substance to the means of repair, the structures that enable the concoction, transference, and absorption of aliment. This aliment, furthermore, is not an innate substance but regularly metabolized out of food. When the structures that digest it dry and harden in the same manner as other inanimate things on the surface of the earth dry and harden, they disable repair.

Nonetheless, one might suspect that Bacon promulgates a vital substance theory because his vital spirit is essential to life and over time deteriorates. Such an argument would maintain that his vital spirit usurps the places of native heat and pneuma whereas his juices replace radical moisture.[38] As Graham Rees has observed, Bacon was not immune to the orthodoxy preceding him; without a crystal ball into the future, he could not hope to fly the very far from the norms of the received physiology. Nevertheless, his concept of vital spirit is not quite the same thing as the inherited concept of vital substance because of one change he insistently makes to the medical spirits. Over time vital spirit does not diminish in amount. Instead, later in life its powers weaken. And, again, its powers weaken, not as a result of the loss of some other substance peculiar to living things, but because of a mechanical process that affects both living and non-living matter. Moreover, although the "juices" that Bacon mentions fall on a scale between adventitious and more "radical" varieties, they do not possess the qualities of a substantial form and clearly are not primigenial. The kind of juice that feeds the vital spirit, arterial blood, certainly is adventitious, not innate.

Admittedly, Bacon encourages the vital-substance interpretation when he deploys the hackneyed flame-life metaphor in relation to vital spirit. But as I would argue, when Bacon employs the flame-life metaphor, it carries a somewhat different tenor. For instance, in the case of his pronouncement that, when unfed, living things "die out just like a fire," he interposes the simile to describe the relatively quick death occurring from the loss of nourishment to the body—from starvation simply—rather than long-term, gradual decay. In the section titled "The Anterooms of Death," where the simile recurs, he employs it in a similar fashion: it enables him to discern how the flame of life, vital spirit, is at last choked out, inducing all manners of death, including natural dissolution. For Bacon, the flame-life analogy possesses the greatest explanatory power when applied to the moments before death, whereas for someone like Avicenna or his many heirs it explains senescence, too. The difference holds because, for Bacon, the metaphor can limn the animate side of

[38] Gerald Gruman verges on this argument when he accuses Bacon of dressing the old theory in new garb. See Gruman, 142.

natural dissolution but not the inanimate. It therefore does not capture the whole of natural decay. Although both mortual and vital spirits contribute to consumption, and thereby also to the defection of repair, the oppression of vital spirits bears the most immediate responsibility for death, any death, including that from natural dissolution. For Bacon, vital spirit is vital in this critical sense: without it or without its proper functioning, life as generally understood either does not emerge or disappears. But Bacon compares the mortual spirits in all tangible things to fire, too. The mortual spirit consumes "like a gentle flame." We might say, then, that Bacon depicts natural dissolution metaphorically yet literally as the effect of two different fires burning in the bodies of living things. What most intrigues him about the traditional metaphor of life as a lamp is the very thing which the metaphor tends to obscure and upon which his second "flame," mortual spirit, impinges; namely, the supply of more oil into the lamp.

As traditionally used, the lamp metaphor breaks down because the simple mechanics of a lamp cannot account for the necessary extinction of flame, i.e. death, much less for the stepwise loss of vigor seen in human bodies. Why can someone not just add more oil to the lamp? And if oil can be re-supplied, would not the flame always burn at the same intensity and last forever? In order to save the comparison between lamp and body, adjustments have to be made to the analogy, but the adjustments do not make much sense on the lamp side. For some reason, the new oil added to the lamp does not kindle very well, so, as it is added, it dilutes the highly flammable, original oil, eventually causing the flame to gutter and die.

Although *The History of Life and Death* certainly demonstrates that, like other early moderns, Bacon uses analogies to anticipate what he could not readily observe, in this case it is the flaw in the analogy, the difference between the two components, rather than their similarity, that provokes him. He concentrates on the slippage. In the case of a lamp, defective apposition does not make much sense. Why does the original oil serve but not the later? In the bodies of living things defective apposition makes more sense, but unfortunately, as he argues, other evidence thwarts belief in the idea of radical moisture. To the detriment of medicine, the assumption of defective apposition has

steered attention away from the question why the means of repair actually do break down. To understand why life fades and expires, Bacon suggests, one must approach it as something other than a lamp. As much as it is like, or just is, a fire consuming that which it is nourished by, it differs from fire too, because fire, even the fire of a lamp, does not feed itself. Only partially akin to a flame or a lamp, life is a phenomenon involving organized bodies that not only consume but also supply. In Bacon's theory, vital spirits substantiates life's flame, rousing the human body's nutritive and animal functions, but the desiccating action of mortual spirits explains why the food repeatedly added to the body eventually fails to supply the fuel that the vital spirits require. Such is a more accurate and clear picture of natural dissolution, according to Bacon. This picture is also more useful, for, as he argues, only by understanding what causes natural dissolution can one forestall or reverse it.

CHAPTER 5

BACON'S TECHNIQUES FOR PROLONGING LIFE

Section (a): Introduction

According to Bacon's theory of senescence, the natural dissolution of the living human body is largely like the natural dissolution of other objects upon the earth. It decays just as a dead human body, vellum, dried leaves, or metal decays, from its consumption by the outer air. The difference is that, when the human body is living, it can repair itself against erosion. Its repair is enabled by its material composition and its vital spirits, both of which, however, carry defects with their benefits. The body's moistures and juices make the absorption of nutrients possible while at the same time they jeopardize the body's integrity by their volatility. Harder substances resist consumption but more quickly turn obstinate to nutrition. Vital spirits conduct the kind of subtle heat needed to catalyze nutrition while at the same time their added heat increases the rate of consumption. In sum, life is perpetually threatened by that which sustains it. The human body corrodes as the subtle, inanimate process of consumption slowly overcomes the subtle, animate process of repair.

With Bacon's theory of senescence elaborated in the last section, we should look to see what that theory entails for the practical aim of prolonging life. Articles 12, 13, and 14 of *The History of Life and Death*, which include Bacon's remedies against natural dissolution, occupy more than a third of the total text. As I said in the previous chapter, the welter of operations included in these articles remove *The History of Life and Death* from the ideal of natural histories envisioned for the great instauration of sciences. Although Bacon's new instrument of learning calls for operations that confirm or refute speculative axioms, the operations presented in *The History of Life and Death* are not of the same kind. They are not so much experimental as therapeutic. Instead of confirming or refuting the theories of matter and human physiology upon which they rest, they can confirm or refute

only their own effectiveness as remedies against the process of senescence. The remedies lie too great a distance from the theories for the cause of their success or failure toward life extension to be transparent. Other theories could explain the same results. For instance, Bacon touts the life-sustaining effect of niter. Nitrous vapors, he believes, can prevent consumption by condensing the vital spirits with cold. Paracelsians, however, also touted the healthy effects of niter. Thomas Chaloner published an entire book about niter in 1584, full of receipts for its composition and use.[1] According to Joseph Du Chesne (Quercetanus), the life-giving property of niter or salt-peter derives from its embodiment of all three of the *tria principia*.[2] If by using courses of nitrous vapor people began to live longer, one could not say for sure which if either of the theories, Baconian or Paracelsian, the success of the treatment confirms. At best, experiments in Bacon's prescriptions could confirm or refute his position that they promote longer life, but not why.[3]

This means that Bacon's innovation in the field of medicine is limited. It is limited to his subjection of senescence to practical inquiry and his call upon natural philosophers to investigate senescence through trial. His new theory of senescence serves future inquiry best by undermining authoritative accounts of aging. *The History of Life and Death* does not chart the course by which future experimenters can divulge the inner workings of senescence. It does not even indicate the next step for the investigation to take. In fact, it contains fewer directions for new experiments than either *The History of the Winds* or *The History of Dense and Rare*.

Bacon acknowledges the shortcomings of his own work. He warns readers that his remedies remain untested and that their success or failure will have to be determined by others. Nevertheless,

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[1] Thomas Chaloner, *A shorte discourse of the most rare and excellent vertue of nitre* (London: Gerald Dewes, 1584).

[2] Quoted in Allen Debus, "The Paracelsian Aerial Niter" *Isis* 55 (1964): 53-4.

[3] Determining a consistent "Paracelsian" theory adds another problem. For Paraclesus niter is a kind of salt, *sal niter*. Thus, medicines made from it would seem to work by their inner essence of salt, preserving the flesh from putrefaction, as he says in *The Archidoxies of Magic* (*Hermetic and Alchemical Writings of Paracelsus*, vol. 2, ed. A.E. Waite (Chicago: de Laurence, Scott, and Co., 1910)): 73. Du Chesne's theory is rather unusual, as Debus notes. Chaloner offers a number of reasons why niter when properly prepared promotes health, but largely he attributes to it virtues opposite to those that Bacon notes, virtues of "piercing," "heating," "enlarging," "dispersing," etc. (2r-3v).

at the same time, he insists that his remedies "are only derived with (as I judge) very good reason, from my principles and presuppositions (some of which I have inserted and others kept back), and are cut and dug from the very rock and veins of nature herself" (OFB XII.240-1). In other words, they are based on his somewhat unusual theories of matter and human physiology. In the foregoing sections, I have tried to articulate those theories, some of which Bacon provides in *The History of Life and Death* and some of which he reserves for other texts. In the current section, I hope to demonstrate Bacon's point that his remedies are grounded in his theory of senescence, which in turn depends upon his theory of matter. Although his remedies cannot do much to confirm his theories, the latter are needed to understand why Bacon advocates some of the peculiar remedies that he does.

Section (b): Health versus longevity

When Bacon organizes the goods of the human body in Book Four, Chapter Two of *De Augmentis*, he lists four: health, beauty, strength, and pleasure. To these disparate goods he assigns disparate arts or knowledges ("*scientiae"*): medical, cosmetic, athletic, and voluptuary (SEH II.586. IV.379). Bacon's designation of separate *scientiae* for the goods of the body flies in the face of Galen's own advice on the same subject in *To Thrasyboulos*. In that tract, written to a young man inquiring whether athletic training falls under the art of health or is its own art, Galen argues through several different avenues that the art directed toward the good of the human body is single. That art, whatever one wishes to call it, and the physician Galen considers "medicine" not a bad choice, is single, because all arts are defined by the goods to which they tend and all the various arts pertaining to the goods of the human body coalesce to one good, health, from which the other goods we sometimes recognize, such as beauty and strength, derive. Health produces beauty and strength, and therefore the cosmetic and athletic arts, which some people erroneously make separate arts, really fit under the same heading, the art of health (63-6).

Bacon's account of the goods of the body and the arts related to them agrees with that rendered by Galen in *To Tharsybolous* on one important ground: as mentioned in Chapter 1, it

distinguishes the branches of knowledge by their goals. It dissents from Galen's account, however, on two other equally significant grounds: it does not group all the goods of the body under the overarching good of health or, consequently, the related sciences under the overarching science of medicine, and it adds the good of pleasure and a corresponding voluptuary science.[4] That Bacon considers pleasure a distinct good of the body and one deserving its own branch of knowledge is an interesting fact in itself, and, according to him, pleasures have something to do with the prolongation of life, as we shall see. However, for the moment, it is Bacon's division of separation of health that is most germane.

To anyone who approaches Bacon's text with Galen's analysis in mind—as, no doubt, many of his first readers approached it—it implies that Galen's opinion that health leads to beauty and strength is wrong. Although Bacon agrees with Galen that all arts, including the arts of the body, are differentiated by the goods toward which they are directed, he does not agree that the goods of the human body have a unitary cause. Galen argues that the unity of the sciences of the human body arises from the unity of the natural conditions of the body itself such that, if one can induce health, one can induce the other goods of beauty and strength. Bacon casts the matter differently. The goods of the human body are multiple, not single, so that the accomplishment of one does not entail the accomplishment of the rest. There is no single good, e.g. health, with a constitution that can exactly determine the constitutions of the others. Thus the branch of knowledge dealing with the goods of the human body receives a name no more precise or familiar than "the division of the doctrine of humanity concerning the human body."

As Bacon reminds readers at the start of Book IV, "all divisions of knowledges [should be] accepted and used rather for lines to mark or distinguish, than sections to divide and separate them" (SEH II.580, IV.373). The rather abstract denomination conjures a relationship between the sciences dealing with the human body and hence reflects their inclusion under one science, yet it still allows

[4] Although Giglioni also uses Galen's in *To Tharsyboulos* enlighten Bacon's account, he takes Bacon largely to agree with Galen. He seems not to recognize the important difference over the predominance of health.

for discrimination between them. The sciences of the body merge and divide because the various phenomena that they observe merge and divide. Because all the arts related to the human body ultimately share the same object, close study of the human body may improve any or all of them; however, differences will remain. Medicine traffics in health; cosmetic science, in the "modesty of manners"; athletic science, in "agility and endurance"; and voluptuary science, in pleasures arising from the five senses. These sciences do not overlap at all points. For instance, Bacon offers as an example of a subject of the athletic science the ability to hold the breath for a long duration. The cause of this ability may reveal something touching upon health; however, health requires more than the strength of the lungs. Likewise, although medicine intersects the study of pleasures, Bacon also mentions parts of the voluptuary art that pertain to things outside the scope of medicine, such as the visual arts, music, and the mathematics that underpin pleasant sights and sounds.

Emblematic of Bacon's philosophy, the classification of sciences is a matter of comparison and contrast, conjunction and separation. As one descends into the branch of bodily goods consisting of health and medicine, the distinctions get tangled. Medicine is the branch dealing with the good of health and includes three offices: the preservation of health, the cure of disease, and the prolongation of life. The confusion comes with the last of these. As one of the medical sciences, the prolongation of life is directed toward the good of health, yet health is also a false lure for anyone seeking longevity. In a series of admonitions contained in *De Augmentis* and *The History of Life and Death* Bacon warns readers about to encounter his nostrums not assume that the same things that promote health also promote longevity (SEH II.599, IV.391; OFB XII.242-3). In *De Augmentis*, his fourth *admonitio* reads as follows:

> Men should rightly observe and distinguish between those things which conduce to a healthy life, and those which conduce to a long life. For there are some things which tend to exhilarate the spirits, strengthen the bodily functions, and keep off diseases, which yet shorten the sum of life, and without sickness hasten on the decay of old age. There are others also which are of service to prolong life and retard decay, which yet cannot be used without danger to health, so that they who use them for the prolongation of life should at the same time provide against such inconveniences as may arise from their use. (SEH II.599, IV.391)

The point that remedies for longevity often conflict with the aim of health is very important to Bacon. Although his series of admonitions differ slightly between *De Augmentis* and *The History of Life and Death*, this particular warning appears in both. Moreover, of all the admonitions, it is the one to which Bacon returns most often—by far. At least seven different passages within *The History of Life and Death* speak explicitly about a difference between health and longevity, often asserting that a given remedy against old age is ineffective or detrimental to the defense of health, or vice-versa.[5]

As the passage above demonstrates, the office of prolonging life aims at health, but somehow, at the same time, it differs from the offices of preserving and restoring health, for longevity does not emerge strictly from health, just as a short life does not emerge strictly from disease. As components in an inductive process, Bacon's remedies for longevity may serve to confirm or refute not so much speculations about hidden forces underlying senescence as the distinction between health and longevity. Longevity arises from more than the avoidance and recovery from disease; it also involves the retardation and reversal of natural dissolution, or the perpetuation of youth. Before one can discern the hidden operations of natural dissolution, one must know that such a thing as natural dissolution exists. Bacon's remedies are grounded in his theory of senescence because, if nothing else, they arise from his insistence that youth differs from health as natural dissolution differs from disease. In other words, they tie back to his attempts to isolate senescence as an object of study.

In Bacon's practical method of discovery, if one cannot control senescence, one does not really know what it is. It might not even exist, in the sense that it might not be a phenomenon separable from the rest of those affecting the human body. Above all, it must be something apart from ordinary disease. Otherwise, the only treatment against it is the preservation and restoration of the body from disease, the functions of the other two offices of medicine. For the same reason, endurance against natural dissolution must be something other than the maintenance of the body

[5] OFB XII.232-3, 248-9, 278-9, 294-5, 300-1, 310-11, and 374-5.

against disease. If those two things are otherwise, the prolongation of life amounts to the avoidance of and recovery from diseases that foreshorten life—the standard meaning of "the prolongation of life" that Bacon overtly repudiates. It is in part to distinguish health from youth and disease from natural decay that Bacon insists strongly upon his warning that remedies for health not be mistaken for remedies for longevity.

Bacon must make those distinctions clear, and knows that he must. Unlike many recent biogerolontologists, who have difficulty isolating senescence from the disabilities and diseases often associated with long life, he offers a precise and thorough definition of the process of senescence. With certainty, Bacon insists that senescence is a phenomenon in its own right. Whatever else it may involve, it consists of the consumption and desiccation of the substance of the human body, processes common to all substances upon the earth. As we shall see in the next subsection, Bacon's prescriptions attempt to redress consumption and desiccation by manipulating the animate and inanimate components of the human body.

But how, for Bacon, does the bodily condition unmarred by natural decay differ from health? This is a hard question to answer confidently. For one, Bacon never develops a clear definition of either health or disease. We have more solid footing in the realm of endurance and natural dissolution. This is not to say that Bacon never discusses matters of health. He does. Book IV, Chapter Two of *De Augmentis* includes a paragraph on the first office of medicine, the preservation of health, and duplicates many pages about the second office, the cure of disease, found in the original *Advancement of Learning*. There is also the essay "On the Regiment of Health," first published in 1597. But in neither of these texts does Bacon say what exactly he means by health and disease. Secondly, as with natural dissolution, Bacon proposes that, whatever they may be, health and disease require the crucible of the new induction before they can be understood fully. Hence, as with natural

dissolution, any definition for health and disease now is preliminary. It is an anticipation, merely a working definition to guide discovery.[6]

Making those preliminary definitions even less secure, Bacon considers health and disease to consist of latent processes, as natural dissolution does. Latent processes are operations of particulate forces of matter hidden from sensory experience. "Of the Regiment of Health" emphasizes the latent processes of the body. It doubts the ability of subjective affect, or the feeling, that one is hale and hardy to indicate sound health and the absence of disease. Its first paragraph reads,

> There is a wisdom in this beyond the rules of physic: a man's own observation, what he finds good of, and what he finds hurt of, is the best physic to preserve health. But it is a safer conclusion to say, *This agreeth not well with me, therefore I will not continue it;* than this, *I find no offence of this, therefore I may use it.* For strength of nature in youth passeth over many excesses, which are owing a man till his age. Discern of the coming on of years, and think not to do the same things still; for age will not be defied (57).[7]

Here, Bacon affirms that foods and medicines induce subtle changes over time that come due (read, arise to the level of sensation) only when one is old. The passage admits that in the deepest recesses of the human body age and disease influence one another. The deprivations of old age make manifest diseases, the germs of which have remained hidden for years, but the subtle changes wrought by the economy of the body over those years also may contribute something to the deprivations of old age, such as the loss of moistures and the subsequent weakness of functions. Bacon recognizes that health

[6] Like "subtlety" and "compendious," the word "anticipation" is an important one in Bacon's lexicon but shifts values with context. Despite his vituperations in the *Novum Organum*, Bacon touts the efficacy of anticipations elsewhere. The difference may be one of degree. The kinds of anticipations condemned in the *Novum Organum* are marked by "supposition and opinion," things that "immediately touch the understanding and fill the imagination" (NO I.28-9). Such anticipations are "rash and premature" (NO I.26). More mature anticipations meet with Bacon's approval. But what differentiates the two points to a central problem of philosophy. The problem is presented by Plato's dialogue *Meno*. In a relevant section in *The Advancement* and *De Augmentis*, Bacon quotes the character Meno: "Whosoever seeketh, knoweth that which he seeketh for in a general notion: else how shall he know it when he hath found it." The section deals with rhetorical topics of invention (II.xiii.8). At the moment Bacon is contending that one course whereby to procure "ready use of knowledge" is Suggestion. Suggestion uses "certain marks, or places, which may excite our mind to return and produce such knowledge as it hath formerly collected, to the end we may make use thereof." It helps us not only to fashion arguments against others and within ourselves but also "to direct our inquiry." "For," Bacon reasons, "a faculty of wise interrogating is half a knowledge." The maneuvers of an inquiry gradually refine the "general notion" with which it starts. But a sound general notion with which to start is important. A larger "anticipation," as Bacon calls it, makes for a "more direct and compendious" search. I suspect that, for Bacon, a larger anticipation exhibits a more productive orientation toward contradicting and confirming instances.

[7] For the text of Bacon's *Essays* I have used *A Harmony of the Essays…of Francis Bacon*, ed. Edward Arber (London, 1871).

and youth, disease and natural dissolution, interrelate. Their fusions, however, make extricating their differences more difficult.

Although the attempt to discern Bacon's conception of health and disease may be difficult, his neglect of explicit definitions provides a starting-point. It is telling. The fact that Bacon does not bother to give a definition of health indicates that in "Of Regiment of Health" and *De Augmentis*, as well as in *The History of Life and Death*, he believes himself to be venturing into a common territory where the suppositions of his readers adequately serve. Because in the previous section we traced Bacon's theory of natural decay, it may be best to try to understand what Bacon means by the counterpart of natural dissolution, disease. In all three works, he speaks of illness and disease in the familiar sense, as the intermittent and short-lived or sometimes recurrent and chronic irregularities that distinguish some parts of the bodily experience from others. Furthermore, his etiology draws upon the humoral theory of the dominant medical tradition. In *De Augmentis*, he identifies as one deficiency in medicine the "accurate observation…of all kinds of humors" (SEH II.593, IV.385). He remains somewhat skeptical of the details of humoral theory as they have been handed down, for he advises that medicine not rely "too much on the common divisions" of humors (SEH II.593, IV.386). He also reproves physicians for "quarrel[ing] many times with humors" when in fact defects in organs are to blame (SEH II.593, IV.385). Nevertheless, he adheres to humoral theory broadly for its postulation of humoral imbalance as a source of at least some kinds of illness. As stated in the *Sylva Sylvarum*, the putrefaction of humors induces most types of agues (SEH II.451-2).[8]

Not surprisingly, Bacon suggests that disease is the disequilibrium of the body's constituents which results in deficient functioning and an affective state of discomfort.
Conversely, health is equilibrium, the condition of the body without disease. In *De Augmentis* IV.2, Bacon avers, "This variable and subtle composition and structure of man's body has made it as a

[8] Two more disagreements with traditional medicine are notable. First, Bacon accuses physicians of praising the mean too much (SEH IV.384). Second, like many English physicians of the time, Bacon also subscribes to certain chemical remedies, which possibly indicates a degree of credence for Paracelsian etiology.

musical instrument of much exquisite workmanship, which is easily put out of tune." Of course, the metaphor of health as the harmony and disease as the disharmony of the constituents of the human body was conventional. At the time, Bacon could have read any number of definitions of health that included it. By and large, medical texts re-hashed the same basic theses penned by Galen. More negatively, health was the absence of illness. More positively, it was the sound functioning made possible by the balance of constituent parts. Most often, it was all those. Bacon seems to adopt the view of all three, absence of illness, sound functioning, and harmony. We have seen the example of balance or harmony. The fourth admonition of *De Augmentis* adds more, warning, "There are some things which tend to exhilarate the spirits, strengthen the bodily functions, and keep off diseases, which yet shorten the sum of life, and without sickness hasten on the decay of old age." The sentence implies that one duty of the preservation of health is to "keep off diseases." Additionally, however, it implies that other duties toward health include exhilarating the spirits and strengthening the bodily functions. These last indicate that health consists of the most robust and uncompromised activity of the body's members, including the vital sprits, which when vigorous broadcast feelings of vivacity (OFB XII.268-9).

As a working definitions or anticipations of health and disease Bacon appears to use rather familiar terms and ideas. What is strange is the effect that the subordination of the prolongation of life under medicine has on the meanings of health and disease. Reminiscent of debates recorded in Chapter 1, Bacon treats natural dissolution ambiguously, as disease and not as disease. Certainly, Bacon recognizes that, like disease, natural dissolution is a bodily change that demands redress. Furthermore, as a branch of medicine, the prolongation of life ultimately serves the good of health. If the privation or antithesis of health constitutes disease, as it did for many early modern writers and as logic seems to demand, implicitly Bacon categorizes natural dissolution as a kind of disease. On the other hand, Bacon explicitly demarcates natural dissolution as something other than disease. Disease is what the first two branches of medicine prevent and cure, respectively. It is not what the office of prolonging life battles against. In *The History of Life and Death*, "the disintegration and atrophy of

old age" results in a death so far different from that by "suffocation, putrefaction, and the various diseases" that Bacon even relegates other deaths to a separate inquiry (OFB XII.144-5).[9]

Implicitly, disease has general and specific meanings for Bacon, as health does. In its more general sense, health is the object of all branches of medicine. In its more specific sense, health is the object of only the first two and the wedge between those and the prolongation of life. To comprehend the significance of Bacon's taxonomy, it may help to recall how Galen handle the question whether old age represents an illness. Whether or not Galen and his early-modern heirs conceived of senescence as a disease often depended upon whether they took a diachronic or synchronic perspective. Over the course of life age was thought of as the gradual and predictable decline of bodily faculties and hence something like a disease, a falling away from the peak of development usually identified with either youth or maturity. Thus, Galen and many of his early modern disciples consign the treatment of elderly patients to convalescence (*analeptike*). At any one moment during the lifespan, however, age could be used as a baseline against which less predictable changes in the body's condition were measured, in which case it served as a relative and evolving standard of health. In *De Sanitate Tuenda*, one of the most influential works for Renaissance gerontology, Galen expresses the latter opinion with great surety, and many physicians and philosophers after him followed suit. Consequently, the word "health" usually captured a chronologically narrow span of the body's condition, adjusting for the predictable changes of age. One of Galen's own definitions of health—"unimpaired capacity of function"—presumes that function can still be weakened by age, for, properly speaking, impairment comprises only the so-called unnatural variety that emerges against the backdrop of supposedly natural decline.[10]

When writing about the prolongation of life, by contrast, Bacon views health and age from a more diachronic perspective. He interprets health to include the best functioning of which a body is

[9] The difference between death by "defect of nature" and death by violence provokes a similar separation (OFB XII.328-9).

[10] See *De Sanitate Tuenda*, 15.

capable during a lifetime—not just present irregularities inducing discomfort—and conversely interprets old age as a disease. Thus the office of the prolongation of life is directed toward that facet of health, sound functioning, which so many other physicians and hygienists of his day recognized only within the horizon of a particular life stage. Bacon expands the horizon beyond the single stage and, by carving out a new office for the prolongation of life, desires to keep a body's highest potential within sight. The prolongation of life seeks more than the preservation and restoration of health when 'health" is taken in the usual sense of absence from perceptible dis-ease; it seeks the preservation and restoration of health when "health" is taken in the sense of the best functioning attainable across the lifespan, or the body's maximum vigor, its youth. For Bacon, the prolongation of life carries the meaning it had for other prolongevists of his era—alchemists, natural magicians, and Paracelsus—because it depends on an expanded notion of health that is diachronic and objective.[11]

In its more general sense (the sense that incorporates all three branches of medicine), health includes sound functioning of the body but in a way that is not always subjectively felt or sensed. However, when narrowed so as to off-set the prolongation of life, health acquires a subjective criterion by which one typically recognizes it. We can see this difference, again, in the fourth admonition of *De Augmentis* although many of Bacon's remedies confirm it as well. In the smaller and more commonplace sense, health accompanies exhilaration of spirits, a traceable increase in bodily functions, and the absence of intermittent diseases that make their presence known by altering the normal state in which we feel our bodies to be, a state of equilibrium marked by, at the very least,

[11] Still, Bacon makes allowances for the more moderate sense of prolonging life. In *De Augmentis*, Bacon does not claim that the commonplace idea that life is prolonged by the interception of disease is wholly wrong, only that it is not precise enough. He writes that "there is no doubt" of the idea's validity, then goes on to explain that life can be prolonged in other ways. Bacon allows that health and perdurance overlap and, likewise, that disease and senescence overlap. As can be seen in some examples from "Of Regiment of Health," at times he hews to the commonplace meaning. Simple hygienic practices can promote longevity: if, for instance, one keeps a cheerful disposition when eating, sleeping, or exercising—controlling four of the hygienic non-naturals—one will attain to "long-lasting." Furthermore, one of his most unusual medical "precepts" applies equally to "health and lasting": people should "vary and interchange contraries, but with an inclination to the more benign extreme." Lastly, the demise of bodily strength in age can exacerbate feelings of illness if one does not take into consideration the "the coming on of years" when one subscribes to a program of physic in youth. But unlike other medical writers, Bacon also demands that medicine discover where health and longevity diverge and—what is more germane for a pragmatic science—where senescence and disease diverge. Those discoveries are necessary to produce true definitions of the respective phenomena.

a lack of awareness of the state itself. In the specific, commonplace sense, health comes with a placid feeling of wellness; sometimes, more positively, with a feeling of liveliness.[12] In the more general and more unusual sense, health stretches out to a longer view, from which the body's attenuation of spirits and functioning creep along so gradually that one does not notice the change until it reaches such an accumulation that its effects come to light. This is the point that the first paragraph of "Of Regiment of Health" drives home. The effects of aging are always present, just not always able to be felt or observed. One must deduce their presence from the analogy with other living bodies that eventually have shown signs of senescence and, from that analogy, anticipate their eventual manifestation in this case as well. This is an objective judgment rather than a subjective sensation. Consequently, while combating natural dissolution, the office of prolongation of life cannot assume that feelings of high spirits and good health, or even feelings of "no offense," indicate the right kind of inner workings that will sustain a general condition of well-being for a long time. Occasionally, it even must induce ill feelings and acute diseases in order to adjust the body into a disposition better suited for longevity. Exactly why, according to Bacon, that is the case and how one goes about making those adjustments are two questions that the next subsection addresses.

The mode of "Of Regiment of Health" and the taxonomy of medicine in *De Augmentis* signal that, generally, Bacon was re-thinking the traditional notion of health. In *De Sanitate Tuenda* Galen proposes the more negative definition of health (absence of disease) as a way of circumventing a dialectical quandary that the more positive definition (good functioning) invites; namely, that if health is good functioning simply, one might reason, as Galen says people sometimes do, that life is nothing else but perpetual illness and health is a figment of the imagination. Understanding health as good functioning, such persons could argue, first, that each of us can always point to someone else whose body functions better than our own and, next, that even if we recognize in ourselves the perfect or

[12] The twentieth-century philosopher Hans-Georg Gadamer uses the word "equilibrium" to define the goal of the medical art in "Apologia for the Art of Healing," an essay that is especially provocative when juxtaposed with Bacon's comments on medicine in *De Augmentis* and "Of Regiment of Health." See Gadamer, *The Enigma of Health*, trans. Jason Gaiger and Nicholas Walker (Stanford: Stanford University Press, 1996): 31-44.

near-perfect specimens of good functioning, old age continually and stealthily debilitates us, eventually ruining that best state in which we find ourselves. According to Galen, disease is the criterion of distinction by which health makes sense as a category; without it, the skepticism that he attacks collapses bodily experience into a unitary imperfection mocked by an impossible ideal.[13]

Like Galen, Bacon often employs a common-sense and traditional distinction between health and disease. However, in "Of Regiment of Health," the emphasis on latent process suggests that life is a perpetual illness although objectively, not subjectively, known as such. A taxonomy of medicine that includes the office of the prolongation of life conveys a similar suggestion. The definition of health must be stretched to cover the stability of functioning through life. For much of life, however, that functioning suffers decline. Bacon seems not to have gone to that opposite extreme ridiculed by Galen, from which vantage point health loses all meaning and disappears into smoke, for he retains the division of health and disease. But he does come close to sublimating the division.

In sum, Bacon distinguishes between intermittent disease and the "disease" of age in part because of their impressions or symptoms. Disease as commonly understood makes itself known to sense. Natural dissolution does not. Or, at least, the first makes itself known much sooner than does the second. Additionally, though, Bacon distinguishes disease and natural dissolution on the basis of how each goes about reducing health and its relative difficulty of cure. For him, as for many of his contemporaries and predecessors, disease is accidental or unnecessary in the sense that not everyone need be affected by the same diseases in the same way at the same time. Furthermore, intermittent disease, once it has emerged, often can be dispelled again. By contrast, age works much more regular changes on the body, and its medical treatment is "a work of labor and difficulty, and consisting of a great number of remedies, and those aptly connected with one another." Its treatment requires drastic and unforeseen measures of human art and industry (SEH II.599, IV.391). The regularity and necessity with which the disease of age attacks the health of the body when nature is allowed to run a

[13] These points are discussed in Chapter 1.

free course indicates that it develops by a different process than intermittent diseases do. Both processes occur largely below observation, and their discovery will be the continued work of medicine and natural philosophy: "medicine not founded on natural philosophy is a weak thing" (SEH II.590, IV.383). Nonetheless, the differences in the symptoms, durations, and tractability of each are enough to draw from Bacon the supposition that natural dissolution works in a way that is, at some level, different from that of intermittent disease. Consequently, he reasons, senescence requires prescriptions and ministrations that are also, at some level, different.

Section (c): Bacon's three precepts for the prolongation of life

As a way of organizing and selecting Bacon's prescriptions for longevity, I have chosen to follow the signposts that are the three Praecepta appearing in *De Augmentis*, IV.ii. These precepts, which do not occur in *The History of Life and Death*, follow and epitomize the Indicia, or Directions, which correspond to the ten Operationes found in *The History of Life and Death*, the specific measures by which to accomplish the three medical Intentiones related to enlarging the lifespan. The three precepts condense the ten directions or operations but also exhibit what he thought was most important about them. They will be my focus; however, because they are circumscribed by the overarching intentions, and because, in turn, those three intentions are circumscribed by preceding Monita, or warnings, I shall follow briefly the course of Bacon's text till I come to the operations and precepts. The order is, again, Montia, Intentiones, Indicia/Operationes, Praecepta. I shall discuss the first two briefly.

The Monita, or warnings, number four in *De Augmentis* but five in *The History of Life and Death*. With redundancies eliminated, Bacon offers a total of seven warnings in both texts. It is worth reviewing them briefly because they circumscribe his whole project of life extension. In general, they are meant either to deter wrong courses of treatment or to moderate the use of Bacon's

own treatments.[14] One of the warnings against mistaken tacks of treatment is that already quoted above concerning the unrecognized distinction between remedies for health and remedies for longevity. I will have more to say about it a little later. Another is that medical writers before Bacon have discovered nothing great and little that is sound with regard to longevity, except for a few comments by Aristotle. Largely because of the want of useful discoveries, the whole idea of prolonging life is thought to be vain and superstitious. Next, Bacon warns against the intentions of most physicians, who orient their regimens and medicines by the standard doctrines of native heat and radical moisture. That warning ties to another, one of the most interesting and elaborate, which accuses previous proponents of longevity of oversimplifying the means of success. Not only do attempts to nurture the native heat and radical moisture miss the mark, quick cures such as potable gold, quintessences of animals, magical ointments, planetary seals, and essences of minerals are trifling superstitions. "Know for certain," Bacon pledges, "that a work of this kind must of necessity be hard labor, and embrace many remedies appropriately related to each other. For no one can be so stupid as to believe that what has never been achieved can be accomplished except by means never yet tried" (OFB XII.240-1).

Of the cautions concerning Bacon's own praxis, we already have heard one, the caveat that his remedies remain untested. Against that fear, Bacon reassures his readers that his remedies nonetheless derive from "principles and presuppositions…cut and dug from the very rock and veins of nature itself" and are at least harmless if not helpful (OFB XII.240-1). In addition, Bacon advises his readers that the best choice and order of his remedies depends upon the patient. He foregoes such precise instructions, however: "For exactly to prescribe the things best adapted to different bodily conditions, to different modes of life and different ages, as well as which ones should be taken after which others, and how their whole practice should be arranged and regulated, would take too long to

[14] The text of *De Augmentis* comprises only those warnings against wrong courses of treatment. All the warnings related to Bacon's own prescriptions are contained in *The History of Life and Death*. In neither text, however, does Bacon classify and divide the warnings the way I have.

accomplish, and not worth making public" (OFB XII.242-3). But the very first warning that Bacon delivers in *The History of Life and Death* may be the most important given its position, and it too regulates Bacon's own remedies. Simply stated, it reads, "The duties of life are more important than life pure and simple." Bacon advises readers not to undertake any practice that might add years to life but only such as can accommodate personal, civic, and religious responsibilities: "Therefore if there is something that more precisely suits my intentions but yet in any way at all gets in the way of those duties and obligations, I cast it aside." The problem is that several of the ensuing operations mention practices that violate the duties of life. Those practices include "life in caves," "constant baths prepared in liquors," continuous insulation of the body, painting the body, and the severe diet and regimen like Cornaro's that "aims only at lengthening life and disregards all else" (OFB XII.240-1). As Bacon cautions, readers are not to take his so-called "light mention" of such practices as recommendations for their use. "I do not at all insist upon them," he asserts (OFB XII.240-1). Presumably, they appear only for the sake of elucidation of principles. For use, remedies must fit within a larger moral and religious frame. Concerns for the duties of life place a curb upon the extremes one may go to in order to live longer.

My focus, however, is not so much on the warnings that limit and circumscribe the techniques for prolonging life that Bacon endorses as the connection between those techniques and his theory of senescence. I have chosen to orient my discussion by the three precepts that occur in *De Augmentis*, because they distill Bacon's most important instructions for prolonging life from the preceding Indicia. From the exclusive procedure of the Monita, the sphere of Bacon's inquiry successively tightens, from the Intentiones to the Indicia, or Operationes. In *De Augmentis*, it afterwards widens again, slightly, to the Praecepta, which are three more general lessons about the means of prolonging life that, as Bacon says, can be "deduced" from the preceding Operationes, or Indicia. The three precepts that he extracts are the "principal" ones [*praecipua*] (SEH II.601, IV.393). As such, they epitomize the most important practical knowledge concerning senescence, according to Bacon. Not surprisingly, all three precepts reinforce the distinction between health and

longevity. While explaining each, Bacon alludes to operations meant to target natural dissolution as opposed to disease and to improve longevity as opposed to health. Thus the precepts evince Bacon's commitment, manifest in the speculative side of his science by his tripartite division of medicine, to keep senescence isolated.

To understand Bacon's three Praecepta, we first must see how they fit within his larger praxis. Now that we have some idea how natural dissolution works, we can see what is so unusual about Bacon's three so-called "intentions." The word "intention" under which Bacon groups his remedies in both *The History of Life and Death* and *De Augmentis* is a medical term. It indicates the result sought from a certain medical procedure. By Bacon's time, that usage already had a long history. Really, both the word *intentio* and the word *operatio* were medical terms. For instance, Arnald of Villanova (1235-1311) wrote a tract titled *De Intentione Medicorum* in which he declares that all *operationes* of medicine must "intend" either the preservation or restoration of health.[15] According to Graham Rees, *intentio* derives from the phrase *intentio curationis* and denotes "the aim or purpose of a curative procedure and hence a plan of treatment."[16]

Though formally similar, Bacon's intentions expressly contradict those of most physicians. In *De Augmentis*, he writes that "the very intentions of physicians in this matter [of prolonging life] are worth nothing" [*ipsas intentiones quae huc spectant medicorum res nihili esse*] (SEH II.599, IV.391). As he goes on to explain, physicians teach that "death consists in the destitution of warmth and moisture." Therefore, they recognize only two practical intentions of prolonging life, both mistaken: that "the natural warmth should be comforted, and the radical moisture cherished" (SEH II.599, IV.391). In direct challenge to those, Bacon proposes three intentions that reflect his own analysis of natural dissolution: (1) the prevention of consumption, (2) the improvement of alimentation, and (3) the restoration of youth.

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[15] Arnald de Villanova, *Opera medica omnia*, vol. 5, ed. Michael McVaugh (Granada: Seminarium Historiae Medicae Granatensis, 2001).

[16] See OFB XII.liv.

Of these, the first intention relates to the inanimate part of investigation of senescence; the second and third, to the animate part. With regard to the human body, the prevention of consumption refers to keeping each member in that state between moistness and dryness and between hardness and softness that resists the transference of matter into air or spirit yet best suits the structure and function of the part. Both the perfection of alimentation and the renewal of youth relate to what distinguishes animate from inanimate things, the process of digestion. The perfection of alimentation assists the natural course of digestion whereas the renewal of youth circumvents it. As Bacon cryptically adds in *De Augmentis*, the renewal of youth is a "mechanical" intention. (SEH II.600, IV.392). Over time, many mechanical things exhibit the putrefaction known as rust (SEH II.451). Similarly, organic matter exhibits desiccation. By dubbing the intention of renewal of youth mechanical, Bacon may mean that by this intention one removes desiccation from the human body the way one may remove rust from metal machinery.[17]

Each of the three intentions comprises several operations, which are more precise means of achieving the intention.[18] Each operation differs by the object that it attempts to influence. There are ten operations in all, four attached to the first intention, four to the second, and two to the third. The prevention of consumption influences spirits, air, blood, and juices. The improvement of alimentation influences the major organs, the outward parts, food, and the last act of assimilation. The restoration of youth, which Bacon soon refines to the renewal of parts, influences all solid parts and the juices of the body. The table below groups the operations according the intentions that they fulfill.

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[17] More precisely, Bacon says that things endure either in identity or by repair and that flame and mechanical things endure by repair. The three modes of endurance here contrast with the two modes of endurance mentioned in *The History of Life and Death*. They indicate, Bacon argues, that the human body is to be preserved "as bodies inanimate, and again as flame, and lastly to a certain degree as things mechanical are preserved" (SEH II.600, IV.392). These he makes synonymous to the three Intentions, the preservation from consumption, the perfection of alimentation, and the renewal of youth. Here and in other texts Bacon hangs upon the intention of renewal of youth the qualifier "to some degree." He does not qualify the other two intentions the same way. Possibly, he considers the third the greatest limiter to human longevity as its success depends upon the contravention of a natural process.

[18] Again, with the word *operatio*, Bacon employs traditional medical terminology. As noted, Arnald of Villanova paired the words *intentio* and *operatio* in his own writings. More than likely Bacon knew some of Arnald's tracts. *De Inentione Medicorum* deals with the question whether medicine is speculative or operative knowledge and argues that it is both. Reifying Galen, Arnald writes, "*intentio medicorum sola operatio est*" (102).

Bacon's Three Intentions and Ten Operations

Intention 1: The prohibition of consumption
- Operation 1: On spirits (vital), to keep them young and re-strengthen them
- Operation 2: On air, to exclude it
- Operation 3: On blood and the heat that produces it
- Operation 4: On the juices of the body

Intention 2: The perfection of repair
- Operation 5: On the viscera, to force out aliment
- Operation 6: On the external parts, to attract aliment
- Operation 7: On the aliment itself and its insinuation
- Operation 8: On the last act of assimilation

Intention 3: The renovation of the old
- Operation 9: On the softening of parts that have dried
- Operation 10: On the elimination of old juice and replacement with new

We need to explore each of these intentions a little more.

The Prevention of Consumption. The first operation to prevent consumption is to maintain or restore the youth of the vital spirits. The "youth" of vital spirits is their optimal density and heat. By rejuvenating vital spirits, one makes them less greedy. One can maintain or restore their youth by repelling, "cooling," "calming," or "sedating" them. The second operation is to exclude the air. This is accomplished by inhabiting places with less pernicious air or by covering and anointing the body. As the third operation, one protects the blood from over-great consumption of the spirits by cooling it, largely by means of purgatives and specially prepared baths. Fourthly, one works to make the juices of the body somewhat hard yet also moist and roscid, something accomplished three ways: by ingesting firm aliment, by chilling and condensing the skin and flesh, and by performing appropriate modes of exercise.

The Perfection of Alimentation. The fifth operation total targets the digestive organs in order to prompt them to expel aliment efficiently. It calls for eating smartly and taking supportive medicines all through life, different foods and different medicines for each of the four principal viscera involved in concoction (stomach, liver, heart, and brain). The sixth is to attract aliment to the outward parts as effectively as possible. It requires the excitation of the outward parts by the motion

of the body, through either massage or exercise. The seventh works on the aliment itself, ensuring that it "insinuate" itself properly into the external parts. A varied diet, good seasoning, and the right preparations of meat, bread, and drink assist toward this end. The eighth pertains to the final act of assimilation of aliment into the part it nourishes. Its one axiom is to still all local motions that could disturb assimilation.

Renewal of the Body. Here, one may apply two different operations. The ninth total is to intenerate all the dried parts at once from the outside. This softening contrasts with the operations for improving repair, for it proceeds immediately and externally instead of circuitously and internally. The principal procedure is emollient baths. Because emollient baths affect all parts at the same time, they make for rather imprecise therapy. Although Bacon mentions unique means for softening each part individually, he chooses to pass over those instructions out of concern for length. The tenth operation is what Bacon calls "renovation by turns," the flushing out of old juice followed by the introduction of new. This is accomplished by purges repeated so often that they become familiar.

In general, Bacon's operations strive for the exacting but always intricate manipulations of cold against heat and density against rarity both within individual parts of body and within the body as a whole. By offering entrée into the particular operations without a full and tedious rehearsal, Bacon's three Praecepta refine this general picture. The precepts are, in Bacon's own words: first, "the prolongation of life is to be expected rather from periodical diets, than from any familiar regimen of living, or even from the excellence of particular recipes"; second, "the prolongation of life is to be expected rather from the working on the spirits and from the softening of the parts, than from the modes of alimentation"; and third, "the softening of the parts from without should be affected by things of kindred substance, things that impress, and things that close up."

Precept One. The first precept states that "the prolongation of life is to be expected rather from periodical diets, than from any familiar regimen of living, or even from the excellence of particular recipes." Although seeming to pertain to alimentation, it impinges on all three intentions, including the preservation from consumption and the renewal of youth. Canon 30 of *The History of*

Life and Death recognizes two kinds of diets generally, *Diaeta Familiaris* (the familiar diet) and *Diaeta Statae* (diets fixed for certain periods). The familiar diet is that which we use every day; the fixed-period diet is that which we take up temporarily but, as Bacon insists, with some regularity. In the terms of classical medicine the familiar diet corresponds to an instrument of either prophylactic or preservative medicine, the kind of thing one does to maintain health or prevent disease. The fixed-period diet, on the other hand, corresponds to an instrument of therapeutics, the kind of thing one applies in order to overcome disease and restore health. But that is classical medicine. With the differentiation between health and longevity comes a parallel change in practice: the body must be treated as sick even when it appears to be healthy. We must treat the body as sick, Bacon argues, because natural dissolution is always working to undermine it. To fight senescence, but not to foster health, the fixed-period diet exerts the greater benefit: "For things which have virtue enough to turn nature back are mostly stronger and cause more peremptory alterations than those which can safely be taken into normal use" (OFB XII.374-5). By "turning nature back," Bacon denotes not only the restoration of the parts (the third intention) but also rejuvenation of the spirits (the first intention). *The History of Life and Death* includes three fixed-period diets, he says: the opiate diet, which in accordance with the first operation tempers the spirits; the emollient or softening diet, which in accordance with the ninth operation softens the outward parts externally, thus assisting digestion; and the emaciating or renovating diet, which in accordance with the tenth operation purges old juices and, through the regular modes of alimentation, replaces them with new.

As we can infer here, the first precept points forward to the next two. To understand it fully, we require their elucidation; however, without that, we still can see how more precisely Bacon challenges the traditional fusion of health and longevity. As stated in *De Augmentis*, fixed-period diets are so strong that they cannot be mixed with other medicines or food and therefore must be taken "in series, and regularly, and at set times recurring at certain intervals" (SEH II.601, IV.393). Their intensity necessitates their intervals of disuse. Conversely, Bacon warns against the over-great dependence on moderation in familiar diets. Drawing upon his collection of human examples of

longevity, Bacon determines that longevity seems to go with those who occupy the extremes of dieting, ascetics and gluttons. Ascetics who follow the "Pythagorean or monastic diet" or the "more evenly precise" diet of Luigi Cornaro are long-lived. But so are certain persons among "those who live freely and in the normal way" [*qui libere, & communi more vivunt*], that is, "the gluttons, feasters, and lovers of a good spread" (OFB XII.228-9). Although Bacon declares that the "moderate diet" [*Media Diaeta*] taken by temperate men deserves praise and does in fact assist health, he blames it for doing "virtually nothing for longevity." Thus, he is taking exception to the one of the most familiar practices of Galenic physicians and hygienists. The kind of moderate diet that they have championed fails to accomplish much for longevity, he reasons, because the virtue of the mean is not quite as simple as they have supposed. His reasoning why the medial diet is so inadequate warrants full quotation:

> For the more rigorous diet generates spirits scanty and sluggish, whence it consumes less; but the ampler diet furnishes abundant nourishment, whence it supplies more repair; the moderate diet does neither. For where the extremes are harmful, the middle way is best; but where the extremes are good for you, the middle way is practically useless. For strict diets need vigilance, lest the scanty spirits be oppressed by too much sleep; slight exercise lest they be unloosed; and sexual abstinence lest they be exhausted. But a more generous diet needs the opposite: plenty of sleep, lots of exercise, and sex at the right time. (OFB XII.228-31)

Here, Bacon challenges the Aristotelian and Scholastic arguments for the mean by pointing out that in some cases the extremes are not bad, as the Aristotelian paradigm would dictate, but good. In cases where the extremes are good, the mean is practically fruitless. One such case is diet and regimen. Bacon defends the proposition by recourse to his theories of spirits and human physiology. The restriction of food weakens the vital spirits, reducing consumption, whereas a gluttonous diet strengthens repair. Proof is in the kind of vigilance necessary in each case to maintain health: the first kind of diet requires measures to prevent the dissipation of weakened vital spirits, whereas the second requires measures that curb their heat. The middle diet has neither the advantage of weaker vital spirits nor the advantage of improved repair.

As this passage indicates, the right course of treatment, according to Bacon, amounts to sorting the complications between consumption and repair. But what does one do, eat like a monk or eat like gourmand? Bacon next turns to the Roman physician Celsus to introduce his own prescription for everyday dieting. As Joshua Scodel has commented, however, Bacon misquotes Celsus with the result that he makes Celsus say the very opposite of what Celsus's words mean.[19] According to Bacon's construction of Celsus, one should vary and alternate one's diet "but with a leaning towards the generous." In other words, one should acclimate to both sleep and wakefulness but more often to sleep, to both famine and feast but more often to feast, to both contentions and remissions of mind but more often to remissions (OFB XII.230-1).

Significantly, each of these examples is one of the six traditional non-naturals. Bacon contradicts most traditional hygienists, however, in two regards. First, he asserts that what best encourages youth in each case is not quite the middle but a position to one side of the middle, and, secondly, he asserts that best condition in each case comes with polar alternations, not a constancy in the state best suited to one's disposition. His advice that one oscillate between extremes reinforces the sense that in the terms of Galenic medicine Bacon approaches senescence as an ever-present disease. In Galenic medicine, oscillation to an opposite extreme in one of the six non-naturals is typically a therapeutic or curative prescription, a measure to restore health. According to Bacon, though, one should adjust to "variety" [*Varietatem*]. One should acclimate oneself to either extreme at different times but, as he happily concludes, spending more time in the more pleasant alternative.

For promoting youth, then, Bacon endorses a regimen that resembles a punctuated equilibrium in which a variety of multiple goods replaces the steadiness of one. *Varietas* makes several appearances in *The History of Life and Death*. Among Bacon's prescriptions, it often contrasts startlingly with Galenic protocols. Frequent changes in menu actually assist longevity not

[19] Joshua Scodel, *Excess and the Mean in Early Modern English Literature* (Princeton: Princeton University Press, 2002): 55-6. Scodel argues for a correlation between Bacon's shifting of the mean of health and his shifting of the mean of ethics, politics, and knowledge. Bacon also cites Celsus's adage in "Of Regiment of Health." For Celsus's Latin, see OFB XII.439-40.

only because they stimulate the appetite and thereby quicken repair but also because a variety of aliment gains "better and swifter access to the veins and juices than does a simple and homogeneous one" (OFB XII.310-11). Variety of airs advances longevity, as evident from the long lives of travelers, to whom the change of air becomes a familiar experience (OFB XII.280-1). In fact, variety should characterize all our behaviors, the pursuits and studies we take up, our foods and drinks, the passions we indulge, our evacuations and perspirations. In such matters Bacon counsels that we "neither follow routine until it palls nor take up novelty before we feel a strong and vigorous desire to do so" (OFB XII.268-9).

Ultimately, the benefit of variety traces back to the vital spirits. Bacons reasons that one should exercise sound judgment in letting go the old and taking up the new because the vital spirits "delight in both routine and novelty." The right balance between routine and novelty sustains the vital spirits in their best state of vigor (OFB XII.268-9). The idea justifies a point about regimen that Bacon often raises, that longevity-fostering variety is regular and familiar, not haphazard and brief. Routine changes facilitate both delights of the vital spirit. Hence, the diets that do so much to reverse the course of nature must be spaced into fixed periods, or regular intervals, even though their power necessitates that those intervals not be too short. As a way of compensating for the length of the intervals, Bacon even prescribes nine comparable regimens that can be used every day. For instance, the effects of niter approximate those of opium, but without nearly as much violence or danger. Such regimens are safer for frequent application; however, they still differ from the diets of food and drink to which one's body is most accustomed. Thus they allow for a high degree of routine mixed with novelty, promoting longevity well beyond what such alimentary diets can do (OFB XII.374-5).

In general, Bacon's *diaeta statae* imperil health for the sake of longevity and, because of their peril, must be discontinued at intervals. These periodic diets tend to work by reducing the paradoxically ill effects of good health. The heat that stimulates vital impulses, especially repair, can easily lead to consumption and desiccation. Thus, states of high health, great vitality, and profound emotions spell disaster, for their cumulative effects reduce the length of life. On the other side,

powerful periodic diets that promote longevity induce temporary illnesses and may even kill, if overdone. Opiates, for instance, which congeal and rejuvenate vital spirits by putting them to flight, have not only the obvious narcotic effect but, when applied superficially, can mortify a part of the body to the verge of gangrene (OFB XII.246-7). For the sake of longevity, the almost debilitating side-effects of the periodic diets that Bacon recommends are worth the dis-ease inflicted by their use, so long as one exercise prudence when using them.

Precept Two. Bacon's next two precepts add to the first, also guiding readers back to the operations that pertain to the periodic diets. The second precept reads, "Prolongation of life is to be expected rather from the working on the spirits and from the softening of the parts, than from the modes of alimentation" (SEH II.601, IV.393). Ordinary diets work through the pathways of natural digestion, furnishing aliment to the spirits and parts at length. The three fixed-period diets minister to the spirits and parts more directly. They are not diets of food, really, but regimens of medicines, vapors, baths, ointments, purgatives—things either not assimilated through the natural courses of digestion or assimilated from the outside. Generally, as Bacon goes on to explain, the second intention of prolonging life, the encouragement of alimentation, is "tedious and circuitous." However, "the ways by working on the spirits and on the parts are much shorter, and sooner attain the desired end" (SEH II.601, IV.393). In other words, the first and third intentions work more efficiently than the second, overall. In this quotation, "spirits" denotes the vital spirits, as becomes clear when Bacon elaborates the first operation in *The History of Life and Death*.[20] Two things affect the vital spirits most directly: vapors and passions. Things that affect the parts most directly include baths, unguents, and plasters.

[20] In this section particularly but also in the book as a whole, Bacon often uses the unmodified *spiritus*, which suggests that what he says pertains to both kinds of spirits. The ambiguity makes deciphering the book's pneumatology notoriously difficult. But if one keeps in mind certain principles about each (vital spirits: that they keep to channels, that they do not desire to escape the body, and that they mediate sensory impressions, motions, and affects; mortual spirits: that they occur in all tangible substances and that they escape the body via attraction to air), one can make better sense of his comments. In this section, that vital spirits are intended becomes clear from the many references to feelings and the senses.

In *The History of Life and Death*, Bacon devotes more pages to the first operation, "on the spirits to keep them young and help them recover their strength," than to any other, almost tripling the number of pages that he devotes to the next longest. He offers two reasons for the added emphasis. One, the more important, is his conviction that the "renewal [of the vital spirits] is the easiest and most direct route to the prolongation of life" (OFB XII.272-3; cf. 364-5). Although, as we have seen, Bacon scorns the elixirs and nostrums purported to lengthen life all at once, he maintains that in the midst of the human body's many complications certain "more compendious" ways exist by which to battle senescence. He favors both the operations on the vital spirits and the operations on the parts because they are "more compendious" than those on alimentation, the slowest means by which to prolong life. The other reason is that physicians and other writers have tended to ignore operations on the spirits (OFB XII.270-3). Of course, writers such as Ficino and Paracelsus did register the importance of "spirits" to health and longevity, as Bacon surely knew. Instead, he implies that such writers did not deal with spirits astutely enough. As seems likely, Bacon means that, because most other writers tended to ignore the properties of matter, they failed to understand just how the spirits of the body work and how exactly they both shorten and lengthen life.

Of the two more compendious ways to prolong life, Bacon considers the quicker to be the operations on the spirits. "The spirits are the craftsmen and workers who do everything that happens in the body," Bacon attests, an axiom "affirmed by general consent and countless instances" (OFB XII.244-5). Because of the spirits' mastery over the functions of the body, it follows that "if a man could arrange to put into an old body spirits of the kind characteristic of a young one, it is likely that this mighty wheel might put the other, lesser wheels into reverse, and turn back the course of nature." I noted before that in *De Augmentis* Bacon compares the renewal of youth to mechanical operations, and here, although this first operation falls under the first intention and not the third, Bacon deploys a mechanical metaphor to depict renewal. The vital spirit is the main wheel in a machine consisting of many other wheels. If one can alter the first wheel and make it turn backwards, all the other wheels

should turn backwards, too. In that way, renewed spirit can renew the parts. Or, at least, such a result is "likely" [*consentaneum est*].

Bacon continues by explaining how a renewed vital spirit can affect the rest of the body. Renewing the vital spirits equates to putting them in such a condition that "they do not drink and soak up the juices of the body but only sip them" (OFB XII.244-5). Vital spirits that sip the juices of the body have, as explained in my previous chapter, a robust heat rather than a sharper [*acrior*] heat. Like flames, vital spirits with sharper heat desiccate bodies, but those with strong, robust heat soften and melt them. Thus, Bacon concludes, vital spirits "should be invested and armed with such a heat that they are drawn rather to undermining and wrecking hard and unyielding bodies than to taking and carrying off fine and elaborated ones." A robust heat accomplishes the former; a sharper heat, the latter. The right kind of heat—robust—keeps bodies "fresh and firm" (OFB XII.246-7). Especially, it keeps the harder parts amenable to alimentation and keeps the flesh and juices oily. By recrudescing the vital spirits, then, one can accomplish something in the way of reversing senescence of the whole body, the third intention. The rejuvenation of vital spirits softens the rest of the body and slows the consumption of the juices and other moistures needed to keep bodily parts at a consistency that enables assimilation and other vital functions. It is key to overcoming the torture of Mezentius.

Heat, though, is not vital spirit's only quality that enables greater longevity. Because the heat of the vital spirits also relates to their density, number, and motion, the right degrees of those qualities matter, too. Bacon summarizes the first operation: "The spirits should be so worked on and modified that they become dense, not rare, in their substance; persistent, not biting, in their heat; their bulk should suffice for the functions of life, and not excessive, or swollen in their abundance; and steady, not twitchy or uneven in their motion" (OFB XII.246-7). Bacon divides the rest of the first operation according to the four qualities of substance, heat, abundance, and motion. In spite of what the division may suggest, however, these qualities are deeply implicated. In *The History of Life and*

Death, Bacon maintains that denser spirits generate a heat less sharp and more robust. In the *Novum Organum*, he defines heat in terms of motion. Affecting one quality, one may affect the others, too.

Two things that renew the spirits most effectively, according to Bacon, are vapors and passions. The first, vapors, work by condensing the vital spirits, and the second, passions, by curbing their motions. Like many early moderns, Bacon recognizes the effect of vapors on the vital spirits from the alterations wrought on the mind by dreams, passions, and smells (OFB XII.246-7). In his analysis, the passions themselves are kinds of vapors. His delineation between vapors and passions seems to mark the difference between vapors extrinsic to the body and vapors intrinsic to the body. Bacon contends that the most compendious way by which to renew the vital spirits, and hence the most compendious way to prolong life, is through extrinsic vapors, or vapors proper, rather than through the intrinsic vapors of passions. Certain extrinsic vapors achieve greater levels of potency than even passions do.

Of vapors that condense spirits, the two that most interest Bacon are opium and niter. Opium condenses the vital spirits by putting them to flight, whereas niter condenses them by its cold.[21] Of all substances, Bacon asserts, opium is "by far" the most effective at condensing spirits through their flight. Second are subordinate opiates derived from it and "soporifics in general" (OFB XII.246-7).[22] Opium and its ilk "get a good effect from a bad cause," congealing the vital spirits and rendering them less mobile. They work by "antipathy," however, and their antipathy results in a subjective state strikingly like a disease; hence, the bad cause. Typically, the flight of vital spirits is a bad thing, a cause of narcosis, literally a death-like condition of the body marked by low-level functioning. In fact, the opiate diet, a most efficient longevity therapy, succeeds by thwarting health and functioning

[21] Bacon acknowledges two other means of condensing the vital spirits but shows much less interest in them. One is to soothe, the other to sedate, the vital spirits. His explanation of each is scanty and reiterative. The first explanation leads readers back to remarks on opium and niter; the second points ahead to remarks about the spirit's motions. See OFB XII.258-9.

[22] Bacon lists as "simple opiates" opium, the poppy plant and seed, henbane, mandragora, hemlock, tobacco, and nightshade. He lists as "composite opiates" theriac, mithridate, triferae, laudanum, paracelsi, diacodium, diascordium, phionium, and pills of hound's-tongue. See OFB XII.250-1.

so much as to tempt death. In Bacon's model, simple opiates effectively resemble poisons, which can kill vital spirits by a compression wrought from antipathy (OFB XII.328-331). Like many poisons, opiates are "deadly" if in too large a dose (OFB XII.248-9). Applied externally, they "mortify" parts and instigate gangrene (OFB XII.246-7). The congealment of the vital spirits, however, is a gainful effect. Although the suddenness and force of the concentration brought about by antipathy and flight poses dangers, in the end opiates restore life to the body by temporarily mimicking death. Hence, Bacon recommends an opiate diet but once a year, with several provisos attached (OFB XII.250-1). Only weaker, medicinal substitutes of opiates, such as saffron and amber, are safe for everyday use (OFB XII.252-3).

Niter also condenses the vital spirits, just "without any harmful effect or hostile quality," for cold is "nature's own work" (OFB XII.252-3). Niter does not work by way of antipathy, and whereas opiates produce cold through condensation, niter produces condensation through cold. However, Bacon does not hold niter as paramount as a spirit-cooler in the way that he holds opium paramount as a spirit-router. It does better than cooling by aliment, which again he considers weak and circuitous. But in power it falls short of air itself. Smokeless, clean, pure air found away from the rays of the sun condenses the vital spirits better than any other coolant, even niter. Such is the kind of air found "on dry mountain ridges or on shady flatlands exposed to the wind." But here Bacon seems to yield something of the ambition for longer life to the obligations of the best life: he passes over air, because it is "mostly out of our control" (OFB XII.252-5). One should not move to an isolated hilltop just to live longer.

Next to air, niter has the most potent effect because of its cold yet spirituous nature. Most cold things, Bacon notices, house only a few weak spirits, whereas hot ones retain an abundance of strong spirits. Niter is paradoxical, even "unique": of vegetable things, it is the only one cold yet highly spirituous (OFB XII.254-5). It readily emits vapors without being heated, and the vapors chill, condensing the vital spirits "naturally" and blunting their heat. Because natural, cold exceeds opiates

in its power to prolong life. The naturalness of cold-condensers such as niter enables them to be used much more frequently. Their frequency in turn enhances their effectiveness.

Unlike opiates and niter, which modify the vital spirits by condensing them, the passions modify the vital spirits by altering their motions.[23] Motion attenuates and enflames the vital spirits, according to Bacon. Thus, too much motion abbreviates life, for thinner vital spirits with sharper heat do not soften but dry the juices, flesh, and parts.

The "affects," as the term Bacon typically prefers to passions, are one of three restraints to the motion of vital spirits that he mentions. And, like affects, the other two are also traditional non-naturals—sleep and exercise. Not unusually for his time, Bacon declares that sleep restrains the motions of vital spirits and thus promotes longevity because during moderate, placid sleep, the vital spirits consume less. Also not unusually, he recommends the moderation of exercise. Whereas strenuous exercises such as running, ball games, fencing, jumping, and wrestling force the vital spirits into narrow straits, making them sharper and more predatory afterwards, gentler exercises such as dancing, archery, horse-riding, and bowls provoke a motion strong but beneficial (OFB XII.264-5). With exercise, traditional rules of health and Bacon's rules for longevity shade together, but with sleep, Bacon seems to locate the benefit for longevity in immoderation. He cites the example of Epimenides, who survived for many years without food by means of constant sleep, and for the later years of life Bacon advises an almost "endless repose." Sleep quells much of the extra consumption exhibited by living bodies because of the vital spirits that they contain. The vital spirits focus the difference between longevity and health, as Bacon says more explicitly later. He approves sleep after supper so long as excessive vapors rising from digestion do not accompany it. But such sleep, he adds, benefits only the vital spirits; it harms everything else concerning health (OFB XII.262-3).

[23] Bacon treats the modifications of the vital spirits' heat and amount expeditiously. In sum, robust rather than sharp heat is to be attained by avoidance of aromatic and tangy foods and drinks, by opiate diets, and by experience of certain passions. An amount commensurate to bodily functions yet not predacious is to be attained by diets a little more benign than the monastic or Pythagorean diet (OFB XII.258-63).

The affects, however, are what Bacon sets alongside vapors as the most potent means of modifying vital spirits directly. By exciting the motion of the vital spirits, affects can accelerate the process of senescence; by checking that motion, they can slow senescence down. Some affects contribute to one result; others, to the other. Like many early moderns, Bacon speaks of affects in terms of contraction and expansion of spirits. Unlike most, though, he does not identify spirits with affect, collapsing cause and result. In *The History of Life and Death*, he speaks linearly: affects cause the motions of vital spirits, including their expansion and contraction. Again, the affects are vapors and thus something akin to the vital spirits, but they are not identical to the vital spirits.

Like Thomas Wright, Robert Burton, and many others, Bacon affirms that either too great an expansion or too great a contraction of the spirits can injure the body. Also like those writers, he acknowledges the danger posed to health if vital spirits expand or contract too much and recognizes that, if the spirits do, they can induce sudden death, which obviously foreshortens life. But Bacon is more concerned with the smaller and steadier impressions of the affects over the course of life than with the quick, death-dealing ones. That concern reflects his segregation of the strength of youth from health. The difference between the two receives great emphasis when he discusses the affects, because the feeling of vitality is often taken to be a sign of health. Bacon considers that feeling hazardous, because it also signals more active, and therefore more predacious, vital spirits.

In Bacon's physiology, when vital spirits are greatly expanded and rarefied, their heat sharpens, and they consume more of the juices and moistures of the body. When severely contracted, though, as happens in the case of an overdose of opiates or poison, the extreme oppression and vexation can destroy them. To a point, however, contraction is good for the vital spirits and longevity, and the harmful degrees of contraction seem to be fewer than the harmful degrees of expansion. Anyway one rarely hears Bacon recommending the expansion of spirits although he often recommends concentrating them.

Passions normally considered "good" tend to expand the vital spirits; passions normally considered "bad" tend to condense them. But because Bacon judges condensation of the vital spirits

conducive to longevity, he ranks certain degrees of seemingly good passions among the bad and certain degrees of seemingly bad passions among the good.

The best motions for longevity are a strong one that does not scatter the vital spirits and "simple contraction" [*simplex Contractio*]. A familiar happiness [*Laeticia*] braces the vital spirits because it "summon[s] them up without dispersing them." But grief [*Maeror*] and sadness [*Tristitia*] also contribute to longevity, because, so long as fear or too much anguish does not accompany them, they simply contract the vital spirits. Fear and anguish, on the other hand, vex the vital spirits, as does "great dread" [*Metus Graviores*]. But great joys [*Gaudia Magna*] also can shorten life because they, unlike a familiar happiness, thin and scatter the vital spirits. Tempered, though, joys may prolong life, or at least not do as much harm. Beneficial are joys recalled to memory rather than immediately experienced and joys "arising from hope or imagination." Additionally, joys little communicated do not shorten life as much as joys widely expressed. Love abides by the same rules as joy. Hope, being an imagined kind of joy and thus less intense, is according to Bacon "the most beneficial" of all passions—but only if it is neither repeatedly disappointed nor fully satisfied. At the other end is envy [*Invidia*], for the vexation it causes the vital spirits is perpetual. Shame [*Pudor*] can shorten life for a similar reason if it derives from great ignominy, but actually can lengthen life if light, in which case it contracts the vital spirits only a little (OFB XII.264-7). Generally, the affects that adjust the vital spirits to the right degree and disposition exhibit lower intensities, softer motions.

In Bacon's prescriptions for affects, two factors operate to confine the intensities and motions of the vital spirits, temporal distance and stimulation without indulgence. Prospect and recollection of pleasant or frightening objects can stir the sort of temperate joys and fears that bring vital spirits to the degree of heat and density that best serves longevity. Likewise, sexual longings, which reduce longevity if too often indulged, assist longevity if stirred but rarely satisfied (OFB XII.260-1). Bacon touts the efficacy of the pleasant recollections so often entertained by old men, wonder and light speculations of philosophy, garrulity, and, above all, the kind of quickened but not wholly gratified hopes that come with social advancement and a life well planned. Nevertheless, he warns against the

too vehement passions, especially cares and worries. Distressing passions eventually attenuate the vital spirits. Therefore, Bacon groups them with other things that one should avoid as much as possible because of their attenuating effects—"labor too hard," "sweating too much," "too much evacuation," "warm baths," "sex too much and at the wrong times," "malignant diseases," and "excruciating bodily pain" (OFB XII.268-9).

Most generally, Bacon's advice about the affects amounts to quietism. It is not unlike the quietism of Taoist philosophy. The magnitude and intensity of an emotion, not its quality, detracts from the length of life; therefore, one should avoid extended episodes of even great happiness, for fear of the heightened activity of the vital spirits will consume the body more rapidly. When one feels the vital spirits to be in a good condition, Bacon advises, one should sustain them as such by "restraining the feelings, eating temperately, abstaining from sex, working in moderation, and relaxing sensibly." His advice, he claims, runs counter to what most people think and act upon. When most people feel happy and pleased with themselves, he explains, they tend to think that they should exploit their happiness and engage in banqueting, sex, labor, argument, and business. He, on the other hand, warns that following where feelings of health and vitality indicate undermines longevity (OFB XII.268-9).

So far, we have dealt only with the reference in the second precept to "working on the spirits." The second precept also mentions the renewal of parts. Bacon explains that such renewal happens most compendiously not by alimentation but by his ninth and tenth operations, the softening of the parts and the renovation of the juices (OFB XII.370-1). Because the former, the softening of the parts, also relates to the third precept, I shall defer discussion of it for a few moments in order to discuss Bacon's peculiar method of renewing the body's juices.

Bacon's thoughts about the renovation of the juices—the "radical" but not "primigenial" dewiness that suffuses all parts of the body—harkens back to an observation he draws out of Aristotle. In one of the Monita, Bacon admits that in the art of prolonging life—an art that has produced no practitioners who have "discovered anything great […or…] anything sound"—Aristotle

at least has published a short commentary displaying "some acuteness" [*in quo nonnihil inest acuti*] (SEH II.598, IV.391). Apparently, he refers to Aristotle's *De Longitudine Vitae*, which contains remarks about trees that Bacon ponders in *The History of Life and Death*. Eventually, anyone interested in the question why the lives of different things tend to end at different terms is arrested by the examples of long-lived trees.[24] How is it that trees manage to live so long? To many early moderns, trees were virtually emblems of long life. Bacon too finds their example both intriguing and instructive. Aristotle's comments guide his observations: "Aristotle did very well to note the difference between plants and animals as far as alimentation and renovation are concerned." Aristotle reasoned, as Bacon notes, that the much greater longevity of plants, especially trees, has something to do with the fact that trees never stop growing but put forth new branches, shoots, leaves, and fruits, whereas the bodies of animals do stop growing, except for the scanty output of hair and nails.[25] Bacon superimposes an inference that Aristotle does not quite make: "so that of necessity the juices of animals age more quickly." The juices of animals dry faster, Bacon reckons, because after a certain point the bodies of animal never gain substantial amounts of new parts and "everything fresh and youthful draws food to itself more strongly and eagerly than that which has started to dry out." In trees, new growth powerfully attracts abundant aliment which, as it passes through the bark on the way to the branches, renews the bark and the juices in the older parts of the tree—another inference that Bacon adds to Aristotle's text. The strengthening of a tree's trunk after pruning confirms the inference, he says (OFB XII.162-3)

[24] Longevity is one of the features of trees often mentioned in Renaissance literature. Examples include the Oak in the story recounted in the "February" dialogue of Edmund Spenser's *The Shepheardes Calender*. The oak, along with the raven and the stag, constituted a hackneyed trio of long-livers as, for instance, in Donne's *First Anniversary*: "When *Stag*, and Rauen, and the long liu'd tree." In a book presented to the Royal Society in 1664, John Evelyn credits stories of trees living thousands of years. At the time, the modern form of dendrochronology, ring-counting, did not exist. As manifest in Evelyn, ages were calculated by memory, oral tradition, size, and speculative extrapolations comparing the periods of maturity of other plants, trees, and animals. See John Evelyn, *Sylvae, or, A Discourse of Forest-Trees, and the Propagation of Timber in His Majesties Dominions* (London, 1664), 78-81.

[25] *The Complete Works of Aristotle*, vol. 2, ed. Jonathan Barnes (Princeton: Princeton University Press, 1984): 743-4. Aristotle says that plants generally are longer-lived than animals because they are "less watery" and have a certain "oiliness" and "viscosity" that enables them to retain moisture. Trees endure for an especially long time because they "continuously renew themselves" with "new shoots" and "roots" in alternating cycles.

Like trees, livestock and even humans undergo renovation. Bacon discusses their renovation as part of his tenth operation. He observes that when plough-oxen that are tired and wasted move to new fields of fresh grass they soon recover tender flesh. The observation induces him to speculate that if the alteration between wasting and fresh food is repeated often enough, the softness of the flesh may pass to the bones, membranes, and other parts, too. Similarly, among humans, strict diets of guaiac, sarsaparilla, china root, and sassafras—all simples used at the time to treat syphilis—attenuate and consume the body's juices; however, after patients have been brought near death and become "thin, pale, and cadaverous," they soon fatten again, regain color, and are manifestly renewed (OFB XII.326-7).

Drawing upon such examples, Bacon deduces that a fixed-period diet of purgatives like guaiac, sarsaparilla, china root, and sassafras will contribute to longevity. Following convention, he calls this kind of fixed-period diet an "emaciating" or "wasting" diet [*Diaetam Emaciantem*]. Like other fixed-period diets, the wasting diet must recur in order to increase its effectiveness; however, if administered too often, it thins the body too much and has the opposite effect. Bacon recommends that after the peak of middle age [*vergente Aetate*] one undergo an emaciating regimen once every two years (OFB XII.326-7).[26] Like an opiate diet, a wasting diet simulates death in order to bolster life. Apparently, the very thing that Bacon so often warns against—the consumption of juices—can, if carefully managed and soon offset, promote long life. At one point, he calls emaciating diets "artificial illnesses" [*Morbi Artificiales*]. Real consumptive diseases such as syphilis waste the juices but, if "well cured," furnish new ones. *Convalescere est Iuvenescere*, Bacon concludes: to convalesce is to rejuvenate (OFB XII.236-7). Drawing an analogy between old age and disease, the adage harkens back to the Galenic category of *analeptike*, the branch of medicine overseeing convalescence and old age. In the context of Bacon's emaciating diets, the word *convalescere* acquires double force. If old age is not enough like a disease already, it should be made to look like

[26] According to Bacon in the same passage, other, milder "purges" may be used familiarly and still accomplish more than the "perspirations" typically used by physicians at the time.

one. Take a body that many early modern physicians would not consider sick and make it sick, so that one can coax it back to health.

Here two principles critical to Bacon's program for prolonging life emerge into practice. One is that things assisting health do not necessarily assist longevity. Emaciating diets work *per Vices*, "by turns" (OFB XII.324-5). They swing a patient from health to disease and back again, repeatedly. The other is the torture of Mezentius. Importantly, emaciating diets go a long way toward repealing natural dissolution at its source. According to Canon 27, "Frequent renovation of the reparable also irrigates the less reparable." While explicating this canon, Bacon cites Aristotle's views on trees again. Just as new branches encourage the renewal of a tree's other parts, the "vigorous transit" of new juices into a human body also incites the passage of aliment to parts more resistant to repair (OFB XII.370-3).

Precept Three. Emaciating diets, however, are not the only means that Bacon endorses for renovating the parts. In fact, emaciating diets work rather slowly because old juice must drain out of the body before new juice can take its place. For quick or immediate [*subita*] renovation Bacon acknowledges two means, the vital spirits and "emollients" [*Malacissationes*]. We already have discussed the renovation of the vital spirits. Emollients affect the parts, so their addition refines the second precept (OFB XII.370-1). Emollients include baths, unctions, and other applications made to the exterior of the body. Together with the opiate and emaciating diets, the emollient diet constitutes one of the three fixed-period diets that Bacon touts for their power and efficiency in prolonging life. The emollient diet is important enough to Bacon's program that he devotes his third precept to it.

The third precept reads: "The softening of the parts from without should be affected by things of kindred substance, things that impress, and things that close up." More specific than the previous two, it repeats almost verbatim Canon 26 of *The History of Life and Death* and ties back to several paragraphs of the ninth operation, both of which deal with emollients.[27] From what Bacon

[27] Canon 26 reads, "Emollience is effected by consubstantial things, by things which imprint themselves, and by things which close up" (OFB XII.370-1).

says while expounding the ninth operation, it becomes clear that this rather cryptic precept relates to the general renewal of the parts that comes through baths and unctions rather than to the particular renewal of individual parts—a subject that Bacon raises but strangely passes over. It also becomes clear that Bacon considers his prescription for emollients antithetical to the prescriptions about baths made by the ancients and contemporary medicine. As he notes, the Greeks made anointments and hot baths a major part of their daily regimen, but hot baths, Bacon contends, which the Greeks always conjoined to anointments, achieve the opposite purpose of his own instructions for emollience, opening passages rather than blocking them and causing sweats. The anointments and baths of the Greeks were used for entertainment or health (drawing out superfluous humors), not for longevity (OFB XII.276-9). Likewise, "the emollient baths currently in use do more harm than good because they draw out rather than push in, and they loosen the body's structure rather than consolidate it" (OFB XII.318-9).

According to Bacon, the point of the emollient diet is to nourish the parts from the outside instead of from within. He observes that for most living things alimentation proceeds from inside to the outside. The exception is, once again, trees, which take nourishment from the roots into the bark and (he supposes) carry it thence to the inside—an observation confirmed by an experiment of cutting a shallow ring all the way around the bark of a tree (OFB XII.194-5). Given the human body's course of nourishment from inside to outside, Bacon infers that "the most important thing" related to the inquiry into alimentation is "to examine carefully and attentively whether nutrition can be achieved from outside, or at least not by the mouth" (OFB XII.196-7). As he elaborates this point in Canon 23, the outward-bound path of nutrition runs through *ambages*, or "long meanderings" (OFB XII.368-9), by which he denotes the digestive process of breaking down food and converting it into substances similar to the parts they finally serve.[28] Bacon takes this picture of digestion from the predominant natural philosophy of the time. In his view, too much consubstantiality between the thing nourished

[28] Tellingly, Bacon finds that digestion in plants is less finicky and meandering than in animals (OFB XII.194-5).

and its nourishment hinders digestion (even carnivores do not dine on other members of the same species, for instance), yet, nevertheless, food ingested must be prepared so that it approximates the substance of the parts (OFB XII.192-3). Although interiorly the digestive system can send out aliment by mere "extrusion," if the aliment is not well prepared, the exterior parts will not perform their digestive function of "attraction" (OFB XII.194-5). Thus, according to Bacon, ordinary nutrition is a circuitous means by which to prolong life and one fraught with difficulties, requiring attention to the faculties of the various organs, to the preparation of aliment, and to the attraction by the parts. In the elderly, the normal pathways of nutrition run even longer, because "the faculties of nutrition fall into decay." The direct application of "similar substances" through "infusions," however, takes next to no time. Thus, Bacon deduces that nutrition by the quicker and more direct routes of baths, unctions, and even clysters could support and renew the concocting faculties of the aged, especially if taken together (OFB XII.368-9). His reasoning seems to take in to account the thesis recited above that if the parts are softened and thus made more adept for attracting nutriment, the aliment passing outward will irrigate other parts, including those more inward parts involved in concoction.

Bacon's third precept instructs how best to correct certain dangers posed by baths and anointments as normally used. Essentially, the danger is the reduction of longevity in the name of health. According to standard hygiene, baths and anointments are intended to provoke sweats. Sweats, according to Bacon, may serve health by evacuating excrementious humors that induce disease. However, if too abundant or rapid, sweats draw out not only thinner moistures but firmer oils as well, along with spirits. Thus, they can frustrate the prolongation of life while reinforcing health. The hot baths often prescribed to expel humors engender the kinds of sweats that injure longevity (OFB XII.278-9). Bacon proposes his emolliating diet instead. Emolliation protects the mortual spirits. (A major difference between the emolliating diet, and the other kinds of fixed-period diets is that here the motual spirits, not the vital spirits, are the principal target.) External applications influence the interaction of the mortual spirits, bodily moisture, and air. Generally, Bacon considers

anointment with oil "almost the most powerful operation affecting longevity," for it keeps mortual spirits in and air out, maintaining the viscosity of juices and parts. However, anointments, while they promote longevity, also can disturb health. Blocking perspiration, they abet diseases by fomenting an abundance of humors. Therefore, Bacon adds several supplements to his course of emolliation, such as certain purging foods and clysters, intended to preserve health while still advancing longevity (OFB XII.278-9).[29]

Improperly prepared, baths and anointments can either trigger diseases or shorten the span of life. They hasten senescence when they expel juices and mortual spirits. Bacon's prescriptions for emollients aim to avert that danger. His course of emolliation unites the counterbalanced effects of baths and anointments in order to persuade external nourishment as effectively as possible. Unfortunately, as Bacon insists, externally softening the parts of the human body proves much more troublesome than externally softening inanimate objects. Wooden sticks might soften in water, and leather boots might soften when smeared with tallow (OFB XII.170-1). Nevertheless, such signs should not build false hopes for the human body: "for this kind of operation is easier on inanimate things because they draw back and suck in liquors; but it is more difficult in animal bodies because motion inside them is directed towards the circumference" (OFB XII.318-9). To counteract this motion toward the circumference, an emollient regimen requires three things that must follow in sequence, not be combined at once (SEH II.601-2, IV.393-4; OFB XII.370-1).

First, things of kindred substance are necessary because they are "kindly and readily embraced and taken in by the parts, and perform the proper office of emollients" (SEH II.601, IV.393). The proper office of emollients is to prepare the way for nutrition, not to nourish directly. (The next step assists that office.) Of substances most similar to the human body, Bacon ranks above all human blood and the blood of animals but, as mentioned earlier, shunts those aside as "filthy and disgusting" (OFB XII.322-3). In their stead he offers "alimentary substances—fat flesh, beef, pork,

[29] Bacon explicitly rejects sweats, however, as a corrective to the blockage of ointments (OFB XII.278-9).

venison; among fish, oysters; milk, butter, yolks of eggs, wheat meal, sweet wine either sugared or mixed with honey" (OFB XII.322-3). Contact with consubstantial things causes "bodies to open themselves up and relax their pores" (OFB XII.370-1). Consenting substances also contain within them "external wet nurses and nourishers" (OFB XII.320-1).

Next, things that impress or indent themselves "not only act as vehicles for the virtue of the emollients, making it sink more easily and deeper, but themselves also expand the parts a little" (SEH II.601, IV.393). Such things must have some "subtlety," which enables them to slip through and "impart the nutritive power" of the emollients proper, that is, of the consenting substances (OFB XII.320-1). As examples of subtle impressers Bacon lists salts and wines (OFB XII.322-3).

Third, things that close up "retain and keep in and fix for awhile the virtue of both the others, and restrain perspiration" (SEH II.601, IV.393-4). Elsewhere, Bacon calls such things "astringents" [*Astringentia*] and "plasters" [*Emplastrationes*] (OFB XII.320-1, 370-1). They prevent exhalations that would dry the body and thus counteract the softening of the emollients (OFB XII.320-1). Bacon advises that the astringents have more of an "unctuous" than a harsh quality and recommends saffron, gum mastic, myrrh, and myrtle berry.[30]

Section (d): Complication and the medical arts

In order, the three precepts funnel down from most general to most specific. Bacon begins with an endorsement of fixed-period diets over ordinary diets. Next, his preference for operations on spirits and the renewal of parts alludes to two of the fixed-period diets, the opiate for the spirits and the emaciating for the renewal of parts. Thirdly, he provides specific directions for the remaining fixed-period diet, the emollient.

[30] Unlike with the other two fixed-period diets, Bacon does not say how often one should practice the emollient diet; however, he does say that, when one uses the emollient bath that he has devised, it should last for about two hours and be repeated every four days (OFB XII.322-3).

In the Precepts, Bacon encapsulates the chief conclusions to be drawn from his ten operations, and his conclusions, general or specific, all underscore the division between health and longevity because they all relate to fixed-period diets. Longevity, where it departs from health, requires the maintenance and restoration of youth. Youth, the state of the body when all the parts function at their optimal level and their structures are optimally composed, declines into senescence as the natural processes of consumption and desiccation dissolve the structures of the various parts. To halt or reverse the decline of youth is, paradoxically, the work of nature, for the repair of the body is also a natural process belonging to living things. Such repair is the effect of regular diets. To improve upon nature's normal course, however, fixed-period diets are necessary. Fixed-period diets work against the ordinary course of nature; they either temporarily impair the body or seek to circumvent its processes. Opiate diets concentrate vital spirits so that they cannot perform their normal nutritive, sensitive, and cognitive tasks. Emaciating diets starve and weaken the body to an extreme so that alimentation can work more deeply than it does by custom. Emollient diets apply nutriment to parts from the outside, against the centrifugal pathway of the body's regular digestion. The first two kinds of diets hurl the body into states of dysfunction and disease, whereas the last courts disease while it tries to reverse the usual route of nutrition. To maintain and restore youth, Bacon implies, a healthful regimen is not enough; a healthful regimen only allows nature to run its course. Regimens that buck animate nature defy senescence better than animate nature can by itself. Nature is a poor guide because its sensible indicators direct efforts toward health better than they do efforts toward longevity. We feel ill, or we feel well. We realize that something we ate harmed us because of pains in our stomach. However, we do not sense the ill effects of senescence until well after they have taken root.

The clash between health and longevity marks one instance of an important rule involved in Bacon's procedures for life extension. Generally, Bacon believes that senescence can be redressed and life prolonged by two counterpoised actions, condensation to prevent consumption and dilation to strengthen repair. Vital spirits must be condensed to such a degree that they consume less but not to

the degree that they neglect their normal duties, while the grosser substances making up the rest of the body must be condensed to such a degree that they resist the predation by spirits and air but not to the degree that they lose the desire to assimilate and become obstinate to nourishment. On the other hand, vital spirits must be dilated enough that they stimulate repair but not so much that their heat damages the parts, while the food and outward parts must be softened enough that they assimilate well but, again, not so much that they fashion juices and flesh susceptible to spirits and air. Because cold is an effective instrument of condensing and heat an effective instrument of dilating, Bacon concludes, in Canon 29, that "the complication that both consumption and repair are the works of heat is the greatest obstacle to longevity" (OFB XII.372-3). If one applies too much heat in order to stimulate the appetites of the digestive organs and of the external parts, one threatens those very same organs and parts with consumption by spirits and air. If one chills those organs and parts too much while hoping to stave off consumption, one hampers digestion and repair.

Complicatio is an apt term by which to sum up Bacon's strategies for prolongevity. As Bacon says in *De Augmentis*, "of all substances which nature has produced man's body is the most multifariously compounded." People ingest a greater variety of foods than do plants and beasts. Moreover, unlike other animals, "man in his places of habitation, exercises, passions, sleep and watching, undergoes infinite variations" (SEH I.587, IV.380). The compound nature of the human body solicits the complications of its conservation. In man, the paths of nature fold and knit together so tightly that it becomes difficult to extract from them some new work or benefit without also acquiring some unwanted detriment. Nutrition necessitates a heat that consumes. Hard juice prevents waste but also hinders repair (OFB XII.288-9, 366-7). Cooling reduces consumption, but, if it enters by way of the stomach and digestive organs, it can do more harm than good because then it hinders alimentation (OFB XII.372-3). Sleep soothes the vital spirits but aggravates the mortual ones (OFB XII.316-7, 332-3). As one reads *The History of Life and Death*, one notices such complications abounding. However profitable the individual intentions and remedies are, the "choice and ordering of them" will vary according to "different bodily constitutions," "different modes of life," and

"different ages" (OFB XII.242-3). Additionally, because of the different constitutions of the various parts and organs, what benefits one part may harm another. Even one remedy, if done at the wrong time, may counteract another (OFB XII.316-7).

As Bacon says while explaining Canon 29,

> Almost all great works perish from complication of natures, since what helps in one way is harmful in another; and this calls for balanced judgement and skillful practice, which is what I have achieved, as far as circumstances currently permit, by parting benign from harmful heats, and those things which contribute to both.

The greatest of all complications is still the discordant effects of heat upon consumption and repair. The delicate adjustments necessary to control the proper levels of heat reflect the deep intricacies by which the processes of consumption and repair braid together to make and sustain animate things. As Guido Giglioni has recently observed, Bacon represents the durability of human life as a conflict between self-identity and mutability, with self-identity encouraged by the torpor of density and cold, and mutability encouraged by the motions of rarity and heat.[31] Among gross tangibles, cold promotes permanence by condensation. But in their own realm, pneumatics, which are easily stimulated by and productive of heat, are also relatively permanent. It is in the mediate realm of the earth where conflict occurs. Here, pneumatics such as fire and spirits disrupt the self-identity of the gross bodies they impress or inhabit. In animate things this disruptive activity reaches its highest pitch. To produce and sustain life, the battle between tangible and pneumatic becomes a veritable stalemate in which, like the classical paradox, discord becomes concord and the two most basic tendencies of matter, the desire to preserve itself and the desire to communicate with other matter, seem almost to serve one another, fashioning a more complex organism that risks greater durability for metabolic freedom. The inanimate material that builds living things secures greater durability with greater density, which is promoted, in part, by cold. Heat, however, because it thins, promotes consumption, both bad and good; bad in the sense of destruction of the bodies own material; good in the sense of assimilation. Thus, the idea of *complicatio* underscores the puzzle with which Bacon wrestles and that commands

[31] Giglioni, 138-9, 142-3.

the great judgment of physicians and philosophers: how to preserve the animate human body as animate. Only as such does the undertaking to conserve the human body necessarily entail complications.[32]

Given the importance of heat and cold to the preservation of the human body as a living thing, one must be able to manipulate heat and cold in order to prolong life. That necessity leads, if not to another complication, to another problem. Human art has little means to produce heat and cold. Although human art, according to Bacon, can manufacture heat fairly easily and even manufacture a wide array of heats, it has trouble imitating the extremely light but steady heat of celestial bodies, which has a profound effect on spirits. Human art has even more difficulty producing cold. In particular, Bacon says, it has no means yet by which to produce great cold: "we humans have a very powerful source of heat in fire, and extremely weak sources of cold" (OFB XII.164-5; cf. SEH II.304, V.399). Without means of manufacturing cold, we lack efficient means of, above all, condensing spirits.

By stressing the complications involved in the prolongation of life, Bacon struggles to secure the place of that office under medicine and perhaps to assert its claim as an art. The notion of *complicatio* underwrites his Monita. As he warns, the prolongation of life will not come about from a simple procedure but from a combination and interchange of different remedies.[33] In the Renaissance, the complications underwriting health, diseases, and medical therapy were often deployed as a criterion of distinction between learned physicians and empirics—to the advantage, of course, of the university-trained practitioners. The notion of complication suffuses the opening

[32] This is contrary to Giglioni's analysis, which overstresses the permanence of lifeless matter.

[33] The Monita also can be seen as complications affecting the effort to prolong life. Instead of registering physical obstacles, however, they register what Bacon considers the moral and religious obstacles in the way of great longevity. First, such constraints affect the way one goes about investigating senescence and finding remedies against it, as in the case of vivisection, which Bacon deplores (SEH I.593-4, IV.386). Secondly, they eliminate remedies that one may undertake for oneself or prescribe for others. The first admonition that "the duties of life are more important than life pure and simple" induces Bacon to reject the practice of bathing in human blood, a procedure endorsed by Roger Bacon and Marsilio Ficino. Although he also harbors theoretical doubts about the efficacy of "blood-bolstered baths and annointings," ultimately he rejects them because they "seem filthy and disgusting" (OFB XII.320-3).

sentence of Hippocrates's famous first aphorism: "Life is short, the Art long, opportunity fleeting, experiment treacherous, judgment difficult."[34] The Northampton physician John Cotta translates the full aphorism in the introduction to his *Short Discoverie of the Unobserved Dangers of Severall Sorts of Ignorant and Unconsiderate Practisers of Physicke in England* (1612), which attempts to guard physic from supposed interlopers (quacksalvers, widows, apothecaries, parsons, astrologers) who diminish its reputation and accrue to it a tradition of failures—a conventional complaint that Bacon also picks up as early as *The Advancement of Learning*. Physic requires, according to Cotta, more than the disease-specific nostrums of empirics or the arch theories of "methodians," categories reflective of Galen's *On Sects*. It requires a careful negotiation of complex theories about disease and human physiology and numerous, particularizing circumstances, the kinds of things that only wide study and long experience in the profession can overcome. Hence, his introduction attempts to humble readers with a two-page barrage of complications that medicine perpetually confronts. The following two sentences are indicative:

> From the varietie of causes of diseases, what varying differences arise in the manner, quantity, qualitie, and times of remedies: every one requiring a separate and distinct respect and dispensation, even in the same disease and person? The immediate cause from the mediate, the antecedent from the continent, the necessarie from the casuall and contingent, require both a divers handling, and also a distinction in order of handling: neither is there a like consideration of the externall and internall, the positive, the privative, the materiall, the immateriall, those that are single and alone, and those that are jointly and with others.[35]

Generally favorable to Hippocrates, Bacon is especially fond of the expression "*vita brevis, ars longa*" from the first aphorism, which he inserts at key moments in several different texts, not the least of which is the beginning of the Preface to *The History of Life and Death*. In the *Novum Organum*, he recapitulates the aphorism when descanting on the widespread despair that stands in the path of learning's progress (NO I.92). The practical knowledge of medicine demands that one negotiate the complications of which Hippocrates speaks. According to Bacon, so does the newest

[34] In *Hippocrates*, vol. 4, trans. W.H.S. Jones (Cambridge: Harvard University Press, 1931), 98-9.

[35] John Cotta, *A Short Discoverie of the Unobserved Dangers of Severall Sorts of Ignorant and Unconsiderate Practisers of Physicke in England* (London, 1612), 2.

branch of medicine, the prolongation of life. The counterbalancing adjustment of the human body's complications itself requires "balanced judgment and skillful practice" [*librato Iudicio & sagaci Practica*] of the doer—experientially based knowledge that, according to Hippocrates and traditional medicine, applies to therapeutics and prophylaxis and that, according to Bacon, also applies to the prolongation of life. For Bacon, the inclusion of the prolongation of life under medicine means re-conceiving it as a complicated business.

Stressing its complications, Bacon also sets apart his own methods from those of previous prolongevists such alchemists, natural magicians, and Paracelsus. The phrase *Magna Opera*, found in the clause "almost all great works perish from complication of natures," echoes the word *magnalia*, used by Bacon in several texts. *Maganalia naturae* is an alchemical term. Of Bacon's usages, the most prominent is a list of practical objectives for natural philosophy that Rawley included with *Silva Sivarum*. It bears the title "Magnalia Naturae" and ranks as first "the prolongation of life," followed immediately by "the restitution of youth in some degree" and "the retardation of age" (SEH III.167). The title of this list allusively acknowledges Bacon's debt to alchemy. His debt, however, is more of purpose and vision than of methods and discoveries. Confidently, Bacon advises readers not to be duped by the promises of longer life via the quick and simple remedies sanctified by alchemists—a balm, an elixir, or some single cordial. Unlike himself, Bacon alleges, such alchemists believe in and seek the sovereign cure.[36]

With respect to procedures for the prolongation of life, Bacon positions himself against both physicians and occultists—physicians for their misguided intentions, occultists for their facile panaceas—but his advocacy for a complicated regime of therapies aligns him more closely with the physicians. Like Bacon, learned physicians of the Renaissance stress a complicated lot of

[36] One might object that alchemists, too, conceived of radical life extension as a complicated business, involving, for instance, a holy disposition of the soul, an exact time of day and year, the exact degree of heat, the perfect rate of distillation, and the right mixture of metals. But such complications pertain to the attainment of the remedy—an elixir—rather than to its effect, which indeed was often thought to be sudden and peremptory. One might object, further, that in several of his eclectic writings, Paracelsus offers a mixture of therapies for life extension. Although that is true in some texts, in others he also touts a balsam of life and a philosopher's stone, which possess overriding virtue.

prescriptions while also championing the knowledge of case histories balanced by a wider understanding of natural philosophy. In Galenic physiology, the balance of the six non-naturals and the balance of humors are central to the preservation and restoration of health, and those balances are quite delicate. Thus, in their writings, learned physicians recommend an assortment of remedies and underscore the importance of counterbalancing medicines, behaviors, and foods in order to keep or restore an equilibrium of hot, cold, warm, and dry. However, generally, they do not acknowledge another complication crucial to Bacon's praxis. As Bacon protests, such writers are speaking about health and only the degree of life extension acquired through defending against and alleviating disease. They do not discriminate adequately between disease and the process of senescence or between health and youth. Bacon's remedies pose an additional complication in that, as he claims, what supports longevity may subtract from health and what supports health may subtract from longevity.

CHAPTER 6

LIMITS OF LIFE AND MATTER

Section (a): Human longevity in history

Bacon distinguishes between longevity and health, because he believes that as a process aging occurs at a level beneath the processes of health and disease. Its depth and subtlety make it more difficult to manipulate; however, supposing that it can be manipulated, a person receiving appropriate treatments could live longer, perhaps much longer, than even the healthiest of persons receiving standard medical therapies. Abnormal or extraordinary longevity admits of a great deal of interpretation, though. The present chapter addresses the questions "How long did Bacon believe human beings could live?" and "Why did he think so?"

I began Chapter 3 by saying that Bacon was a prolongevist. His belief that natural science could extend the human lifespan from the limit commonly accepted distinguishes him from most medical writers of his time. Commonly, physicians and hygienists of the sixteenth and seventeenth centuries post the maximum length of life at around eighty years, the figure announced in Psalm 90. Some, such as Luigi Cornaro, speak more confidently of the possibility of people reaching one hundred or 120 years, the range taken as the maximum lifespan by many biogerontologists today. But few, if any, imagine them living much longer than that. Assertions that humans can live longer arise in occult and alchemical texts or in medical texts that graft occult and alchemical ideas on to Galenic. A major reason for the prevailing doubt was, of course, theology. For believers, the bible provides convincing evidence that, since at least Noah's Flood, God has gradually contracted the human lifespan to its current size and that, because of Adam's fall, the world itself must undergo old age and death. The two beliefs may inform one another and did for many early moderns who trusted that divine mandates and nature's decline combined to render the extension of the human lifespan

impossible. In fact, because nature waxed old, human beings would be lucky to maintain the seventy or eighty years promised by the Psalmist.

Though not exclusive to the Judeo-Christian tradition, the idea of an aging world shaped biblical interpretation and, during the early modern period, posed a great obstacle to the spread of prolongevist ideas. Holy Scripture does not confirm clearly the notion that, since the time of Moses, the human lifespan has continued to shrink; however, if one already subscribes to the theory of nature's decay, which Holy Scripture may support better, it is easy to suppose that the process of decline visible between Adam and Moses would continue to the present day. Additionally, as Don Cameron Allen and Victor Harris noted several decades ago, empirical evidence cropping up in the early modern world could substantiate the thesis that the world is wasting. Alterations in the heavens, new diseases, the decline of magical powers, and discoveries of giant humanoid fossils all were taken to indicate cosmological decay. As the macrocosm loses virility, this strain of reasoning runs, the microcosm suffers weakness by contagion, or vice-versa. Scripture seems to maintain the reverse direction, the pollution out from the microcosm into the macrocosm, the sin of man infecting all the rest, and, according to the Pentateuch at any rate, divine punishments against man have shrunk the human lifespan from nearly millennial lengths of Jewish patriarchs to the spare eighty years of modern history.[1]

In England, the better-known controversy over the world's age stoked by Geoffrey Goodman and George Hakewill in the 1630s succeeded Francis Bacon's own attempt to lay the matter to rest once and for all in *The History of Life and Death*.[2] This book's second-longest section, on the length and shortness of life in man, seeks, in part, but not in the main, to collect enough historical data to demolish the conviction that the human lifespan continues to shrink by demonstrating that it has not diminished since Moses. The rebuttal is obviously necessary if Bacon wishes to persuade his readers

[1] See Don Cameron Allen, "The Degeneration of Man and Renaissance Pessimism" *Studies in Philology* 35 (1938): 202-227, and Victor Harris, *All Coherence Gone* (London: Frank Cass and Co., 1966).

[2] The controversy between Goodman and Hakewill is the focus of Harris's book.

that their lives can be prolonged. Having gathered scriptural, classical, and contemporary stories, he declares after twenty-two paragraphs:

> The passing of ages, and the succession of generations, seem not to have lessened life expectancy, for we see that the span of human life from the time of Moses down to our age has stayed at around eighty, without (as some have thought) imperceptibly and gradually declining. (OFB XII.218-9)

In the words of Graham Rees, Bacon's collection is a "knock-out empirical blow" to the popular notion of nature in decline (OFB XII.liii).

This empirical counter-punch occupies the fifth through ninth inquiries of the text, which precede the Operations discussed in my last chapter. It comprises examples of superlongevous persons from all over Europe, Christian and pagan, past and present. It begins with the Bible, Genesis through the New Testament, before moving on to "heathen" examples, principally Greeks and Romans who lived before 76 AD, the year of the Vespasian census. After a short Monitum, it resumes with Greek, Roman, French, and German rulers, followed by accounts of Church leaders, apostles, and popes. The nineteenth paragraph then picks up the secular trajectory again, this time listing examples Bacon considers "more doubtful in reliability, and more deficient in detail." These less credible examples start again with certain ancient kings of Europe and move forward through recent history, stopping with two sixteenth-century men, Cornaro and Guillaume Postel. Then, two brief paragraphs testify to the commonality of the very old within English country towns and their occasional appearance in Bedlam hospital. Finally, the collection ends with a brusque dismissal of stories concerning long-lived nymphs and demons, which Bacon considers "fables and dreams, especially as they agree with neither philosophy nor religion" (OFB XII.197-219).

The chief objective of Bacon's inventory of long-lived persons is not to disprove the thesis of natural decline but to supply a storehouse of facts apropos of an inductive inquiry into life and death, in particular the life and death of human beings. The section on the length and brevity of human lives is longer than all preceding sections because it is the most immediately pertinent to Bacon's religious and ethical ideal of extending human life. From it, Bacon purports to draw the many causes and signs

of longevity among people. The derivation of causes and signs ensues upon the collection of facts. Grouped under "Observations," they run for another twenty-eight paragraphs, beginning with paragraph twenty-three, from which I have quoted above. Earlier, in the inquiry on the length and shortness of the lives of animals, Bacon forewarns of the difficulty of untangling such causes and signs from the complicated web of phenomena related to animals:

> Regarding length and shortness of life, the available information is scanty, observation careless, and tradition full of fables. In domesticated animals a degenerate life spoils them; in wild animals a hard life cuts them off. Nor do factors which can be regarded as accompaniments (bodily mass, time in the womb, number of offspring, how long it takes to grow up, and so on) do much to eke out this information; because these factors are not easy to separate, and in some cases they coincide, but in others they diverge. (OFB XII.176-7)

The same factors—mass, length of gestation, number of offspring, time to maturity—influence the life of the animal man, distinguishing its duration from that of lower animals. Other factors, though, differentiate the durations of lives among men, including climate, family, nativities, diets, and pursuits. Therefore, the catalog of facts registers more than just names and numbers; it often adds remarks about the characters, dispositions, heredity, and habits of the individuals enrolled. The subsequent Observations attempt to collate the factors appearing across the inventory in order to isolate them as either causes or signs of long or short lives. Albeit, the connection between data and observations is not always clear, and at times Bacon appears to work more impressionistically than precisely.

The first Observation that he induces concerns the first possible factor of longevity that he mentions, the ages in which people have lived. It is the only factor that Bacon flatly rejects. To demonstrate that historical era does not really determine longevity, he first divides history into two larger segments, before the time of Christ and after the time of Christ.[3] Although the era after the time of Christ appears not split into smaller segments, the preceding one does. These subdivisions fall out according to events of the Hebrew Bible. There is the time before Noah's Flood, the time after Noah's Flood but before Moses, and the time after Moses to Christ. The last era, however, turns

[3] Examples from before the time of Christ occur before the short Monitum.

out to extend to the modern day, because Moses, whom Bacon identifies as the author Psalm 90, says "that man's life lasts for only threescore years and ten, or if he be more robust, fourscore; which has been for the most part the measure of life right down to our own time" (OFB XII.198-9).[4]

In the post-Mosaic era, the "measure of life," or *Mensura vitae*, has remained steady. We might suppose that, therefore, the examples that Bacon adduces following Moses would all have died at around eighty years of age, but that is not the case. Rather, most, like Moses himself, who attained to the age of 120, well exceeded the eighty-year mark. Many of the cases Bacon cites and accredits, whether scriptural or secular, ancient or recent, lived for ninety, 100, or even 150 years. Tobias lived for 158; Gorgias the rhetorician, for 108; three nameless men from the Roman census of 76 AD, for 140; and Guillaume Postel, for almost 120. We must wonder, then, what exactly Bacon means by the *mensura vitae* that has remained approximately the same since Moses.

In this section of *The History of Life and Death*, Bacon deals with two different measures of human life, and he does not have a consistent terminology for either. By *mensura vitae*, what he seems to signify in this context is not an upper threshold, or maximum lifespan, but a kind of average for the time of "natural death." In his collection, Bacon is concerned with natural death, not death by accidents and diseases. As evidence, he ignores cases of persons killed by accidents and diseases, or, at least, he ignores cases of those killed by accidents and diseases before reaching eighty. The average lifespan before natural death is seventy for ordinary constitutions, eighty for hardier ones. Bacon does not inductively or "scientifically" determine this average. Rather, he takes the seventy- or eighty-year limit espoused by the Psalmist as accurate for his own times and then confirms its accuracy for the past through historical examples.

Even while charting the past, however, Bacon is not chiefly concerned with averages. He orients his collection toward the historical maximum. That does not mean that he catalogs only those persons who lived longest, for he wants to do more with his examples than disprove the theory of

[4] Psalm 90 is one of the seven Psalms that Bacon included in his *Translation of Certain Psalms*. There, he renders these lines: "The life of man is threescore years and ten, / Or, that if he be strong, perhaps fourscore" (SEH VII.280).

nature's decay. He also has to decipher signs and cause of longevity, so he includes anyone he considers long-lived, not just longest-lived. Nevertheless, to establish his claim that the period of human life has not shrunk since Moses, he puts the emphasis on maximum lifespan. This is a matter of course. What Bacon seeks to demonstrate is that, since Moses, the maximum extent of life has not dropped significantly. He goes about trying to do so by gathering as his evidence the most long-lived individuals whom history has recorded and whose stories he believes. All such persons lived well over seventy or eighty years, the average, yet the durations of their lives amounted to roughly the same. No such person, either shortly after the time of Moses or now, has lived for hundreds of years—with two exceptions that we shall discuss momentarily. All the longest-lived, at any time of history after Moses, have died at around 150 years or less. The fact that the longest-lived persons have died near the same age demonstrates for Bacon that, since the time of Moses, the natural period of human life has not substantially altered. A stable average lifespan and a stable maximum lifespan seem to go together, as if hidden physics keeps the two in ratio. In fact, Bacon uses the normal lifespan as a means of adjusting the data he receives about the maximum, as I shall try to explain in a moment.

If I interpret Bacon correctly, he makes a distinction similar to that used by biogerontologists today, who differentiate maximum lifespan from average life expectancy. One has to be careful using those terms, however, especially the latter. In the Oxford edition of the text, for instance, Graham Rees translates the Latin phrase *diuturnitas vitae*, used by Bacon in paragraph 23 quoted earlier, as "life expectancy." This translation is not the best both for a particular reason and for a general reason. The particular reason is that this phrase and the one following it, *curriculum humanae aetatis*, which Rees render as "the span of human life," seem to be getting at the same thing, and it is not so clear that that thing is what we would call life expectancy. The more general reason is that life expectancy is a much more recent, demographic term that carries with it a subjective perspective with which Bacon would have been unfamiliar. Bacon's most comparable term, *mensura vitae*, in the context above registers only deaths by old age, not all deaths. As such, it is not fully demographic.

Life expectancy, as we use the term now, is; it incorporates deaths by accidents and diseases. Hence, life expectancies at the end of the nineteenth and twentieth centuries differed markedly. Furthermore, the phrase life expectancy makes more sense when the techniques of science are securing longer lives. At such a time as ours, demographic figures have more control over what duration of life people subjectively expect. Given the spate of *momento mori* books and sermons published and delivered during Bacon's time, not to mention the high rate of deaths by disease that early moderns must have witnessed, it is hard to believe that even the Psalmist's decree would have cemented their expectations of a long life.

All that said, Bacon nonetheless distinguishes between a normal span of life and a maximum span of life.[5] The consistency of each through history contributes something to his judgment that the human lifespan as a whole has not shrunk. Moreover, each helps us measure a little more precisely his expectations for longevity. First, the figure of eighty is literally crucial to Bacon's inventory. One must have survived for at least eighty years to count as long-lived. In the short Monitum inserted between paragraphs on pagan notables, Bacon advises: "To avoid dragging things out, I have thought it best both in the matters already recounted, and in those soon to be, to adduce no age less than 80" (OFB XII.207-8). Thus, his examples begin where the Psalmist declares that life ends. Each one is at least eighty years old. At age seventy, one may reach the common boundary for life, but one does not attain to true longevity—or at least not the degree of longevity that interests Bacon—till one hits the mark set by the Psalmist for the most robust of individuals. Moses was more or less right, Bacon suggests, but he underestimated the longevity to which people can, and do, attain when certain ideal conditions of custom, diet, climate, disposition, physique, heredity, or lifestyle are met. Although none of Bacon's examples applied his own remedies to a tee, most are distinguished by some feature that explains how they passed the eighty-year line—an extremely spare diet, life on a mountainside or

[5] Hakewill, who relies upon Bacon's *History of Life and Death*, distinguishes between a maximum lifespan and an "ordinary course," as I discussed in the Introduction to the dissertation.

in a monastery, courteous and moderate character, greater resemblance to the mother than to the father, military exercises and order, the pursuit of a philosophy that is free not fastidious.

As mentioned, Bacon sets the historical maximum for such long-livers of the past somewhere around 150 years. Although he enlists several examples of persons who lived much longer than that, he discredits any account of a person surviving beyond 150 and some of persons surviving to approximately that age. The ancient Egyptians committed errors in reckoning the years of their pharaohs. The tales of the Arcadian kings living upwards of 300 years are fables. Epimenides the Cretan "is said to have lived for 157 years; but fact and fiction may merge here, since for fifty-seven of them he is supposed to have been hidden in a cave." The Spanish King Arganthonius, who is said to have lived for 130 or 140 years, the Cypriotan King Cinyras, who supposedly lived for 150 or 160 years, and two nameless kings of Latium who allegedly lived for 800 and 600 years, respectively—all are ranked among instances "more doubtful in reliability." Sentences controlled by verbs of speech—*narrant*, *traditur*—enumerate other doubtful cases of longevity: Dando of Illyria at 500 years, many Aetolians at 200 years or more, and residents atop Mount Tmolus at upwards of 150. Likewise, some of the Pandorae, an Indian people, may achieve 200 years; still more wondrous [*mira*], they are said to have white hair in youth but black and grey hair in old age. The case of Joannes de Temporibus is also "miraculous, or rather fabulous," according to Bacon; he is reported to have reached 300 years.[6]

All the same, Bacon sanctions many cases of persons living to near 150 years, even beyond. Examples come from both scripture and secular history. Moses and Aaron arrived at about 120 years apiece. The oldest instance whom Bacon accredits, Tobias the Elder, reached 158; his son, 127. The early Bishop of Jerusalem Simeon of Cleophas died by martyrdom at age 120. Vespasian's census of 76 AD, "a kind of calendar of long life," records some of the most amazing examples of long-lived individuals. In all the regions and towns surveyed, ninety-three men and women lived for at least 110

[6] In the first operation, Bacon mentions a pharmacist of Calicut who "is reputed" [*perhibetur*] to have lived 160 years by taking amber, a substitute for opiates. Bacon may consider this the most credible case of someone living beyond 150 years. He uses the story to confirm the utility of opiate-like substitutes. Nonetheless, the verb casts suspicion.

years, including sixteen who reached at least 130 years and one man named M. Aponius, who lived for 150. In more recent history, the longest-lived instance cited by Bacon is Guillaume Postel, who, as already stated, lived 120 years. In the centuries since Moses, Bacon notes only two persons who far exceeded the 150-year mark. Tellingly, both come from scripture. Phineas, Aaron's grandson, achieved 300 years. The better known instance, Job, survived for an additional 140 years after his hardships ended yet "before his afflictions he was old enough to have sons who had grown to manhood." Although scripture does not state Job's total age, conservatively this would put him close to 175 at death, but he may have lived 200 years or more.

The scriptural origins of both these anomalies at once confirm their truth and open the possibility of unnatural means to explain them. Bacon adds parenthetically that Phineas's extraordinary longevity was accomplished "perhaps by extraordinary grace" [*ex Gratia fortasse extraordinaria*].[7] Divine assistance is more manifest in the case of Job, for the Book of Job chronicles it. Somewhat subtly, Bacon reminds his readers of it: "after the restoration of his good fortune Job lived for 140 years." In the Latin, the phrase construed here as "restoration of his good fortune" is *Instaurationem Foelicitatis suae* (OFB XII.198-9). The word *instauratio*, so important in Bacon's project for the sciences, carried heavy religious overtones in his time, often being used to denote the conversion of the human soul from its earthly to its heavenly state, another feat made possible by divine grace.[8]

[7] Other cases outside the catalog proper occur at OFB XII.252-3 and 274-7.

[8] The religious overtones of this word have not been fully explored by scholars. In a book and an article, Charles Whitney has produced some of the most extensive work on Bacon's use of the word of which I am aware; however, as revealing and incisive as his analysis is, it concentrates on the instauration of the Jerusalem temple and tends to underemphasize the importance, in Bacon's writings, of the instauration of the human body. (See *Francis Bacon and Modernity* (New Haven: Yale University Press, 1986) and "Francis Bacon's *Instauratio*: Dominion of and over Humanity," *Journal of the History of Ideas* 50 (1989): 371-90.) Before Bacon, the most important and perhaps original use of the word to designate the restoration of an individual person appears in St. Augustine's *De Vera Religione*. Augustine contrasts the seven stages of a vicious man's maturity with the seven stages of a faithful man's maturity. At the sixth stage of his development, the Christian is "reborn" [*instauretur*] upon death. See *Patrologiae Cursus Completus*, vol. 34, ed. Jacques-Paul Migne (Paris, 1845), col. 143. This use of *instauratio* continued to resonate in the early modern period. In *De Anima*, Philip Melanchthon uses the noun *instauratio* in a wordplay that connects the awakening after sleep to the transformation experienced after death; his wordplay seems to depend on his audience's recognizing *instauratio* in its Augustinian sense. (See *De Anima*,

While arranging his inventory, Bacon already has made up his mind about which stories are believable and which are not. He does not receive all stories neutrally but trusts some more than others. Several filters may operate here, one being the authority of the Bible, which compels swifter acceptance: unquestionably, Tobias the Elder lived for 158 years, and Phineas, for 300. Another filter, however, is a prior assumption about how far human life can last. This filter derives, I believe, from a principle of nature: without the exertion of art, nature can push its limits only so far. Because of this filter, Bacon doubts some instances for no other reason than the length of life the person is said to have achieved. Cases over roughly 150 years meet with doubt; cases under 150 are credible, provided there are not other reasons to suspect them. Phineas's example perhaps reveals the filter better than others. The Bible authorizes Phineas's great age; however, it does not explain how Phineas could attain it. The fact that Phineas lived for 300 years prompts Bacon to question how such an astonishing feat was possible. In his view, it cannot be explained adequately by nature, habits, and customs. If it could, presumably he would not think it necessary to suggest that extraordinary grace perhaps enabled it. To explain an unnatural feat, Bacon looks to the unnatural means of divine intervention. On the flip side, the case of Tobias the Elder, who lived 158 years, does not compel from Bacon a remark about how his great age was possible. A lifespan of 158 years, it would seem, fits within the bounds of nature. Apparently, what Bacon accepts as the average natural lifespan, about seventy or eighty years, delimits the maximum lifespan that he is willing to believe. With the favors of birth and custom, the seventy- or eighty-year natural lifespan can stretch potentially to 150 but not much farther than that.

In all, Bacon's collection reveals for him only what the historical maximum of longevity has been. The historical maximum may not determine the absolute limit, if one exists. Although good fortune and modest arts have helped many individuals to push the boundary of nature farther than where otherwise it might have rested, a true art of medicine and natural philosophy should be able to

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cols. 95-6.) The comparison between Augustine's seven-stage pattern of Christian maturity and Bacon's seven-stage restoration of the sciences aiming ultimately to preserve the human body is suggestive, to say the least.

accomplish more, to Bacon's mind. If persons of the past could reach eighty to 150 years without a full array of verifiable treatments against senescence, with such treatments, more people should be able to exceed the normal limit, reaching perhaps even 150 years, maybe more.

Did Bacon think that the remedies included in *The History of Life and Death* could accomplish this? That question is hard to answer, because Bacon confesses that his remedies are untested and guarantees only that will not harm, not that they will help. It is worth trying the remedies in order to discover if they will help, and the reasons he suspects that they should help is that they connect to a deeper understanding of nature than what most physicians and philosophers bring to the matter of prolonging life. Still, he admits that his remedies do not derive from the process of induction that will guide true philosophy. We can say with more confidence, I think, that Bacon expects later stages of the great instauration to extend life farther than the first stages. *The History of Life and Death* stands at the nativity of the great instauration. Thus, whatever success Bacon expects or hopes his remedies to have, it would not be the uppermost limit of life for all persons. More work would need to be done either to raise the limit or to ensure that every person, no matter what his natural constitution, could reach the current limit, or both.

A question prompted by Bacon's collection of the long-lived is, then, whether Bacon thinks the historical maximum is the same as the absolute maximum. The question acquires additional complications when we recall that that the historical maximum that we have been discussing so far, 150 years, applies only to persons who have lived since Moses. Before Moses, the historical maximum was much higher, for Bacon accredits the stories of the antediluvian patriarchs just as much if not more than he does many recent cases. Does he then think that people can live only to the peak achieved after Moses? Is there some kind of divine injunction preventing someone who does not receive extraordinary grace, as Phineas might have done, from exceeding that limit?

Rees calls Bacon's catalog an empirical knock-out blow against the popular theory of nature's decline. One must question how devastating a blow Bacon lands. Perhaps he succeeds in demonstrating that since recorded history began the lifespan has not declined in a stepwise fashion, as

one would expect if the world were aging, for after Moses no decline is visible. Still, he admits to a profound drop with the Flood, from many hundreds of years to 200 years, and a steadier, more gradual decline between the Flood and Moses, from the nearly five hundred years after the Flood to the seventy or eighty years of today. How does a theory of natural stasis account for the much longer lives seen prior to Moses? If the drops have a natural explanation, potentially the cases of the oldest patriarchs undermine Bacon's rebuttal to the theory of nature's decline. If they do not have a natural explanation but are some kind of divine edict, the effort of natural philosophy to overcome the limit set in the era following Moses may be impossible.

Quite cleverly, Bacon develops an argument that would have it, not surprisingly, both ways. The argument centers on Noah's Flood. In the first paragraph of his inventory, he admits that "according to Holy Scripture men lived for many hundreds of years before the Flood" although "none of the patriarchs lived to a thousand."

> At the Flood things changed: But straight after the Flood this longevity was cut by half but only in those born after that event, for Noah who was born before it lived as long as his ancestors, and Shem lived 600 years. And then within three generations of the Flood, men's lives had dropped to a quarter of their original length, i.e. to about 200 years. (OFB XII.196-7).

As seen here, the longest-lived of those born immediately after the Flood lived about half as long as the longest-lived before the Flood. Three generations after the Flood, lives were halved again, their span falling to around 200 years.

As his source, Bacon uses Genesis 11:10-32, which he represents fairly accurately though not in complete detail. The three generations succeeding Shem were Arphaxad, Salah, and Eber who lived 438, 433, and 464 years, respectively. With the next generation, Peleg, the lifespan dropped to near the 200-year level; Peleg died at age 239. The roughly 200-year span continued for the next four generations, which go unnamed by Bacon: Reu, Serug, Nahor, and Terah lived for 239, 230, 148, and 205 years, respectively. Terah was the father of Abraham, and Bacon begins the next paragraph tracing Abraham's family. He notes all the generations recorded in Genesis and Exodus between and including Abraham and Moses, which total eight. Through these generations the recorded lifespan

declines fairly steadily from the 175 and 180 years of Abraham and Isaac to the 120 years of Moses. Those who lived between Moses and Christ whom Bacon registers—Joshua, Caleb, Ehud, Elisha, Isaiah, Tobias, Simeon—all survived for around 120 years, Eli the least at 98 years and Tobias the most at 158 years, with the two notable exceptions of Phineas and Job.

According to Bacon's inventory, then, the human lifespan began to shrink upon the Flood. It fell precipitously at first and then gradually, until it reached the seventy or eighty years of Psalm 90. Because in Genesis 6: 5-7 God is said to have to have inundated the earth as a punishment for "the wickedness of man," the reduction of lifespan after the Flood could be, and often was, interpreted as an act of divine will. Bacon, however, takes it as a natural consequence of a natural event yet a consequence nevertheless that is not a sign of nature's inexorable decay. His interpretation depends upon a point that he asserts earlier. In the first paragraph of his inventory, just after mention of the antediluvian patriarchs, Bacon offers this observation: "Now this length of life cannot be ascribed to Grace or the holy line, for before the Flood we count eleven generations of patriarchs, but of the sons of Adam by Cain only eight; so that the descendants of Cain would be longer-lived" (OFB XII.196-7). Bacon reasons that, obviously, great longevity is a boon and, because the descendants of Adam through the murderous and outcast Cain lived longer than the others, it cannot have been granted to the antediluvian patriarchs by God. Instead, they attained their immense longevity by nature.

The sentence carries a profound implication: according to scripture, God does not fix the human lifespan. Perhaps, as the cases of Phineas and Job later suggest, God tenders special grace to a certain few whose lives He chooses to prolong, but, as a whole, longevity is not a matter of belonging to the holy line. The human lifespan is, and always has been, determined by nature, not by God.

Knowing that, Bacon interprets the decrease of lifespan after the Flood as a natural occurrence as well:

> Certainly there are times in particular countries when men's lives are longer or shorter: longer generally in barbarous times with their simpler diets and greater dedication to exercises; shorter with more civilization, good living, and idleness. But these things come and go, and over the generations make no difference. Nor can there be any doubt but that the same is true for other animals, since neither oxen, nor horse, nor sheep, and so on, have lived

> shorter lives in these last ages. Thus was the great drop in age caused by the Flood, and perhaps could be caused again by similar great disasters (as they call them), like less general floods, combustions wrought by long droughts, earthquakes, and so on (OFB XII.218-221).

Noah's Flood was a natural catastrophe, and its consequences comparatively mundane.[9] It was like any other great disaster such as fires and earthquakes, just on a much bigger scale—one affecting all of humanity, not just isolated societies. Thus, its effects can be understood naturally. Longevity alters from time to time and place to place with different customs. Similarly, we can understand how it might alter periodically and locally because of disasters. A disaster such as Noah's Flood, which covered the entire globe, affected longevity the same way as smaller disasters might but with farther-reaching and longer-lasting results. In conclusion, if scripture indicates that God does not fix lifespan by fiat, and if the same effect can be explained naturally, there really is no reason to assume that effect of the Flood upon human longevity was not natural.

One would like to hear Bacon say explicitly what he seems to suggest concerning how a widespread or localized disaster reduces longevity: devastation to the environment eventually takes its toll on those who live within and feed upon it. Nonetheless, the main point is clear. The cause of the lifespan's shrinkage is natural. That point has a profound consequence for science. As a natural event with a natural cause, the detriment to the human lifespan wrought by the Flood should be amenable of redress. That means that with the assistance of a vigorous natural science and an inductive medical practice, the lifespan can achieve not only the greatest lengths after the Flood but also the greatest lengths before.

The advancement of the arts is paramount, of course. But theology feeds into those arts. From the examples just given, we can see that Bacon violates a pattern to which Graham Rees has said Bacon adheres. This pattern is a kind of test of natural philosophy by Christian theology. According to Rees, in spite of Bacon's insistence that theology and natural philosophy occupy different spheres, he recognizes checks upon natural philosophy imposed by faith; the division

[9] Another consequence of the Flood, according to Bacon, was change in stature.

between natural philosophy and theology pertains to discourse, not to a choice of theories. For Bacon, "natural philosophy was not to be invaded by revealed theology, but was nevertheless an activity bounded by it, and any theory that seemed to violate the boundaries was *ipso facto* suspect." In other words, Bacon applies theology when making a choice among the broadest speculations about natural phenomena. In such choices, theology serves as a kind of guard against doctrinal error but not as proof of a claim. Tenets of faith can deny theories of nature but not confirm their truth. As an example, Rees offers what he considers the most important such "boundary condition," namely, that the universe came into being and will pass away. According to Rees—and his opinion seems right to me—scriptural affirmations of the world's creation and destruction prevent Bacon from subscribing to a view that the cosmos is eternal (OFB VI.x.lviii-li).

Human longevity introduces other such boundary conditions. One we already have seen: Bacon refuses to extrapolate from the Flood a divine injunction against longevity when the Bible mentions none and when the decrease in lifespan after the Flood can be explained in natural terms. However, in the case of human longevity, theology also does more than circumscribe Bacon's natural philosophy. It invades it. It supplies material to his storehouse of facts. Because of theology, Bacon knows and trusts that antediluvian patriarchs lived for extraordinary lengths. Without that trust, their stories would defy the conclusions that natural reason otherwise holds.

Their admission into the natural history has profound repercussions for the inquiry into life and death, with its practical component of prolonging life. We can see this quite clearly if we consider the corresponding attempts of current biogerontologists to estimate potential lifespan. Barring Holy Writ and mythology from their science, biogerontologists today lack examples of persons who have lived extraordinarily long lives. They do not begin with the knowledge that certain human beings have lived well beyond 110 years; they have only a set of cases falling within the same, relatively-narrow range.[10] From that set and an enlarging experimental knowledge of human

[10] They also tend to dismiss more recent reports of super long-lived peoples residing in such places as the Republic of Georgia, Ecuador, and Kashmir. See, e.g., Hayflick, 196-202; Kirkwood, 48; and Olshansky and Carnes, 205-8.

physiology, they predict what kind of life extension may be possible in the near future and beyond, but, without proper evidence, they debate whether prolongevity is even possible. Bacon begins with different stock. The cases of the Jewish patriarchs confirm that human life not only can but has attained much greater lengths than what we witness. Thus, revealed knowledge advances Bacon's effort; it cements the possibility of prolongevity. In that regard it is even more important than his theory of senescence. His theory of senescence permits the possibility that natural dissolution can occur at a slower rate than we typically see, but it does not make the possibility a fact. Biblical authority gives Bacon the fact.

We run into theology again when we ask how far the arts of knowledge can carry the human body, according to Bacon. Behind the antediluvian age of the Jewish patriarchs lies the paradise of Eden. As discussed in my introduction, the prevailing interpretation of Genesis held that, without the Fall, Adam and Eve would not have experienced natural dissolution and death. The pair could have lived forever or until God translated them to heaven without decay, pain, or death. Perhaps Bacon thought that natural philosophy, once perfected, could overcome even the scourge of mortality introduced at the Fall; in other words, that it would acquire the means to stop natural death forever by completely arresting senescence. Such is the implication of certain studies of Bacon's great instauration of sciences. Scholars have claimed that Bacon sought to restore the prelapsarian condition of humanity through natural science.[11] A highly significant feature of that condition was immortality. Therefore, whether intentionally or not, their claim entails that Bacon sought to make human beings immortal. Is this correct?

To support the point that Bacon wished to restore humanity to prelapsarian felicities, scholars may, and often do, cite two sentences from the last paragraph of the *Novum Organum*: "For man by the Fall fell both from his state of innocence and his dominion over creation. Both of these, however, can even in this life be to some extent made good; the former by religion and faith, the latter by arts

[11] Rees says, "in part restore prelapsarian felicity" (OFB XII.xlvi). Whitney, in *Francis Bacon and Modernity*, often speaks of Bacon's instauration as "prelapsarian"; its purpose is to restore a "prelapsarian oneness with nature" (24).

and sciences" (NO II.52). The sentence reveals two paths for human redemption, one religious for the soul's redemption and one scientific for the body's redemption. As concerns the latter, the quotation certainly shows Bacon to be aiming in the direction of an Edenic restitution, but we must pay heed to the little phrase "to some extent" [*nonnulla ex parte*]. Here, and most anywhere Bacon makes mention of the option of immortality, he qualifies it, especially in his later writings. In *The History of Life and Death*, the flame of life can be "potentially eternal" [*potentia aeternum*] or almost eternal [*quasi aeterna*] (OFB XII.144-7). In *De Augmentis*, medicine should seek to lengthen the thread of life itself and postpone "for a time" [*ad tempus*] death by age (SEH I.590-1, IV.383). In the list "Magnalia Naturae," one of the three medical intentions of prolonging life is trimmed, as it is in *The Advancement of Learning* and *De Augmentis*, to "restitution of youth in some degree."[12] In the manuscript *Valerius Terminus*, written perhaps as early as 1600, "The true [end] of knowledge" is the "discovery of all operations and possibilities of operations from immortality (*if it were possible*) to the meanest mechanical practice" (SEH III.222; italics added). And here, at the end of the *Novum Organum*, man's control of nature can be restored only "to some extent," perhaps because of the very matter over which Bacon expresses skepticism elsewhere, the utter conquest of natural death.

Although confident about extending human lives to Old Testament proportions and even beyond, he reserves grave doubts about immortality. The question whether natural science can restore to humanity prelapsarian deathlessness exposes a tension in his speculations and assumptions. Immortality by human means encroaches upon the command of God and displaces the opportunity of grace; however, to declare it impossible amounts to deciding finally a principle of nature before natural inquiry gets off the ground, contravening the mobility of all canons. A chief reason to deny earthly immortality is, of course, religious, and, significantly, in *The History of Life and Death*, the catalogue of the long-lived begins after the Fall. Bacon's demarcation may reproduce the impenetrable barrier laid down at Eden. On the other hand, if the decrease in longevity seen after the

[12] In *The Advancement of Learning* (II.viii.3, 97), Bacon uses an expression similarly qualified: "restore some degree of youth or vivacity."

Fall cannot be attributed to divine penalty and is therefore remediable, maybe even the shift between immortality to mortality can be reversed as well. Either interpretation may be possible, because Bacon articulates nothing here about whether or not Adam and Eve were immortal or what if any effect their Fall had on nature. Furthermore, in other texts, Bacon assents to two beliefs that would seem to stand as obstacles to human beings becoming immortal even if extremely long-lived. One is that the world must come to an end, and if the world ends so must everything within it, including the human population. The other is that without death there is no afterlife, a reward for the faithful promised by scripture.[13] These look like two boundary conditions, the first intimately connected to that identified by Rees. However, although both reasons satisfy constraints of theology, they still permit the possibility of natural immortality: although the cosmos could not endure divine destruction, people would live forever if God does not intervene and tumble creation back into chaos.

While, admittedly, the difference between an eternal life and a life of potentially thousands of years is practically moot, a look into Bacon's reasons for doubting human immortality takes us to the most basic principles of his matter theory and cosmology. At the perimeter of Bacon's speculations about matter, we also uncover the intricate weaving of his religious ideas and theories of nature and the tension between them.

Section (b): The metaphysics of human longevity

On the Wisdom of the Ancients contains two musings about the early history of mankind that can supplement the catalogue of human longevity contained in *The History of Life and Death*. Both blame mankind's inability to conquer natural dissolution on an aversion to proper science. In "Orpheus, or Philosophy," Bacon contends that "natural philosophy proposes to itself as the noblest work of all, nothing less than the restitution and renovations of things corruptible, and (what is the same thing in a lower degree) the conservation of bodies in the state in which they are, and the

[13] For his belief in the final destruction, see SEH VI.652, 726. For his belief in the afterlife, see *The Advancement of Learning* II.XX.4.

retardation of dissolution and putrefaction." The classical myth of Orpheus leading Eurydice out of the underworld only to lose her as he turns backward, emblematizes, according to Bacon, the "curious and premature meddling and impatience" that distracts philosophy from its highest aims. Instead, just as Orpheus is said to take his lyre and sing dirges for Eurydice, philosophy turns to civic affairs after "the diligent trial and final frustration of the experiment of restoring the dead body to life" (SEH VI.648, 722). The necessities of law and order replace the noble goals of philosophy, and civilization, which earlier we saw Bacon say also shortens life with its luxuries and idleness, amplifies its damage by diverting human effort away from an advancement of learning that ultimately can relieve civilization from the necessities that compel politics.

In "Prometheus, or the State of Man," human indolence and diversions come to a similar effect. In Bacon's rendition of the myth, after Zeus discovers Prometheus's theft of fire, he awards the human race not only with fire but also "with a new gift, of all others most agreeable and desirable,—perpetual youth." The "foolish people" then place their new gift on the back of an ass, which ends up trading it to a serpent in exchange for a drink of water, "and so for a mouthful of water the power of renewing youth was transferred from men to serpents." Bacon construes this episode of the myth to signify "that methods and medicines for the retardation of age and the prolongation of life were by the ancients not despaired of, but reckoned rather among those things which men once had and by sloth and negligence let slip, than among those which were wholly denied or never offered." People lost the gift of perpetual youth because "wanting in themselves": they entrusted it to a "lazy and slow-paced ass," an allegorical symbol for "experience." To maintain the gift of perpetual youth or to acquire it again, people must combine the "empirical faculty" of reason with its "dogmatical faculty." That is, they must apply their minds to a thorough and rigorous study of nature that yokes the knowledge of experience under a "certain law and method." Before now, Bacon insists, the two parts of the intellect "have not yet been well united and coupled" (SEH VI.673, 750).

Bacon's dexterous interpretations of these two myths underscore the importance, in the quest to renew and preserve natural bodies, of a diligent attention to natural causes and a new logic of

inquiry, respectively. Because people have tended to become distracted by lesser pursuits and have not properly combined the two faculties of inquiry, they have not been able to bring the worthiest and "most composite" and therefore "most powerful" of natural bodies, the human body, to its full term, not even in generations long past when the world was better disposed to the nurture of its longevity.

With the advancement of learning, life should be able to be protracted to greater lengths than known of late, but Bacon's mythographies signal another limit to human power. Earlier, I mentioned that two reasons Bacon entertains as to why immortality is impossible allow for natural immortality all the same. Another reason discounts natural immortality: the power of human art to alter and improve upon nature is limited by its control over the corruption affecting all tangible bodies at or near the surface of the earth. The art of prolonging human life depends upon the parallel and superior arts of physics and metaphysics, which enable the understanding and, what amounts to the same thing for Bacon, the control of natural dissolution in all living and non-living things. This is because the process of senescence in the human body starts from the natural dissolution of its inanimate parts. Bacon's theories about cosmic origins and matter delimit his anticipations for the success of the new science's ability to preserve material bodies from corruption, but those theories are themselves influenced by, and perhaps chosen because of, Christian theology.

In *De Augmentis*, the topic of the prolongation of life appears in more than one place. Thus far, I have discussed only its inclusion as a branch of medicine. The first time Bacon mentions it is in a chapter translated, with additions, from the original *Advancement of Learning* of 1605.[14] The chapter discusses the operative counterpart to metaphysic, natural magic. Bacon accuses "degenerate Natural Magic, Alchemy, Astrology, and the like" of concocting "hopes and beliefs of strange and impossible shapes." One such hope and belief is the transmutation of metals; the other is the prolongation of life.

[14] I refer to III.v in *De Augmentis* and to II.viii in *AOL*. Quotations come from the latter.

Of course, by listing the prolongation of life here, Bacon does not despair of its accomplishment. Rather, he despairs of its accomplishment by the methods employed by ordinary natural magicians, alchemist, and astrologers: "in their propositions the description of the means is ever more monstrous than the pretence or end." These impostors to natural philosophy replace "the laborious and sober inquiry of truth" with "high and vaporous imaginations," and for that reason they, especially alchemists, serve as examples of radical empiricists who lack a sense of true method, the means to derive reliable higher axioms from a variety of instances. It is upon their method of inquiry that Bacon places emphasis. Just as "it is a thing more probable" to transmute metals if one has real knowledge of "the natures of weight, of colour, of pliant and fragile in respect of the hammer, volatile and fixed in respect of fire" than if one merely projects a medicine upon quicksilver, so

> it is more probable that he that knoweth the nature of arefaction, the nature of assimilation of nourishment to the thing nourished, the manner of increase and clearing of spirits, the manner of depredations which spirits make upon the humours and solid parts, shall by ambages of diets, bathings, anointings, medicines, motions, and the like, prolong life, or restore some degree of youth or vivacity, than that it can be done with the use of a few drops or scruples of liquor or receipt.

This passage broadcasts the need of understanding natural phenomena related to life and death before one can prorogate life to its full term. These other phenomena—nutrition, pneumatic motions, consumption—will not be explicated by medical physicians treating patients but must be discovered through corollary and overarching investigations into deeper activities of nature. More specifically, the prolongation of life will involve further discoveries of physics and metaphysics. As Bacon explains in *The Advancement of Learning*, physic and metaphysic are two of three speculative branches of natural philosophy, which begins with natural history, or collections of particular instances, and ascends to physics and thence to metaphysics. Natural history "describeth the variety of things; physic the causes, but variable or respective causes; and metaphysic the fixed and constant causes" (AOL II.vii.4). Physics and metaphysics each has its operative counterpart because "all true and fruitful natural philosophy hath a double scale or ladder, ascendant and descendant; ascending from experiments to the invention of causes, and descending from causes to the invention of new

experiments" (II.vii.1). Works confirm theories, which in turn generate more works. The operative counterpart to physics is mechanics; the operative counterpart to metaphysic is natural magic. Bacon partly attributes the failure to prolong life to deficiencies in natural magic, deficiencies which redound to mechanics.

Traditionally, natural magic has foundered, according to Bacon, because metaphysics, its theoretical guide, has foundered. Whereas physics "should contemplate that which is inherent in matter, and therefore transitory," metaphysics should contemplate "that which is abstracted and fixed" (II.vii.3). Physics minds a certain narrow range of instances, the structures and forces operative in particular bodies, or, in Aristotelian terms, material and efficient causes. Metaphysics, however, attends formal and final causes and depends upon larger comparisons of instances. But because final cause is more of a background from which metaphysic proceeds than an object which it pursues, formal cause is its true intent.[15] Metaphysics seeks the discovery of nature's forms. By "forms," Bacon means something unconventional. Just as he alters the normal conception of metaphysics to set it beneath natural philosophy, so he alters the meaning of its object. Simple forms are not Platonic abstractions or ideals but basic "natures and qualities" that give rise to the diversity of all other things. They are nature's alphabet out of which all other combinations, or compound forms, such as lion, oak, gold, air, and water, are possible (AOL II.vii.5). As examples of these building blocks, Bacon lists "dense, rare, hot, cold, heavy, light, tangible, pneumatic, volatile, fixed" (SEH II.566, IV.361). These differ from the objects of physics in that no one form appears exclusively in a particular thing but they underwrite virtually every phenomenon of nature. By another turn of phrase, forms are nature's most fundamental "laws," but laws grounded in the structures and motions of tiny material bodies: "When I speak of forms I mean nothing but those laws and definitions of pure actuality, which govern and constitute any simple nature, such as heat, light, weight, in every kind of material and subject that is capable of receiving them." Though discerned from an array of instances,

[15] For more on my meaning here, see the final chapter of Part Two.

forms are not abstractions, for, as Bacon cautions, "however heterogeneous and disparate" their instances appear, those instances "meet in the form or law that governs" them (NO II.17). In *De Augmentis*, Bacon gives the example of whiteness:

> If the cause of whiteness in snow or froth be inquired, it is well rendered, that it is the subtle intermixture of air and water. But nevertheless this is far from being the form of whiteness, seeing that air intermixed with powdered glass or crystal, would create a similar whiteness, no less than when mixed with water; it is only the efficient cause, which is nothing else than the vehicle for the form. (SEH II.566, IV.361)

The discovery of such laws is ultimately the point of Bacon's new instrument of logic, which seeks to define simple forms by the careful comparison of instances in which they occur, in which they do not occur, and in which they occur to different degrees.[16] The great instauration of learning culminates with the discovery of all simple forms and the great works of nature that their discovery makes possible: "For it seems to me there can be hardly discovered any radical or fundamental alterations and innovations of nature, either by accidents or essays of experiments, or from the light and direction of physical causes; but only by the discovery of forms" (SEH II.573, IV.366).

The operative arm of metaphysics, natural magic, studies how to bring about radical or fundamental alterations and innovations of nature. Like the ancient Persian magic, it stands "for a sublime wisdom, and the knowledge of the universal consents of things," the sympathies and antipathies that Bacon identifies with the debased and impotent natural magic of his day. Its novel conjunction with metaphysic, however, promises unprecedented fertility: this science "applies the knowledge of hidden forms to the production of wonderful operations; and by uniting (as they say) actives with passives, displays the wonderful works of nature" (SEH II.573, IV.366-7). The last phrase is "*magnalia naturae*," which alludes to the promises of alchemists, who often used the phrase to refer to effects of the philosopher's stone, the transmutation of metals and the rejuvenation of the human body.

[16] These instances constitute Bacon's three tables that filter legitimate natural history, the Table of Existence and Presence, the Table of Deviation or Proximate Absence, and the Table of Degrees or Comparison (NO II.11-13).

Using efficient causes as vehicles, simple natures or forms—dense and rare, hot and cold, and so on—operate within the bodies and activities studied by physics. Thus, the discoveries of metaphysics impinge upon physics, widening its theoretical scope as well as its practical powers. For Bacon, the prolongation of life is largely a matter of the complementary pair of physics and mechanics, the family of sciences into which medicine falls. Nevertheless, the discoveries of the metaphysics and natural magic, which are of a higher order, must profoundly influence it. For instance, from Bacon's perspective, knowledge of the differences between tangibles and pneumatics, between dense and rare, and between hot and cold has undoubted import for the theoretical knowledge of senescence and the operative knowledge to control it. However, what one really wants to know in order to prolong life is not so much the definitions of tangibles and pneumatics, dense and rare, and hot and cold wherever those qualities occur—in metals and minerals, in stars and the ocean's depths, in the farthest reaches of the cosmos—as their expressions within the human body and within those things affecting the human body: in vital and mortual spirits, in digestion, in the surrounding air. The true power over nature lies in intermediate knowledge. The guarantee of such intermediate axioms, however, comes only with the ascent to higher axioms and subsequent descent to broader powers.

Bacon gives an alternative formulation for these four branches within natural philosophy may help to illuminate their consequence for the prolongation of life. It appears in the first Aphorism of the second book of the *Novum Organum*:

> It is the task and purpose of human power to generate and superinduce a new nature or natures on a given body. It is the task and purpose of human knowledge to discover the form of a given nature, or its true specific difference, or nature-engendering nature, or source of emanation (for these are the terms I have which come closest to the thing). And subordinate to these primary tasks there are two others, secondary and of an inferior character; subordinate to the former, the transformation of one material substance into another, within the bounds of possibility; subordinate to the latter, the discovery, in every instance of generation and motion, of the *latent process* operating continuously from the manifest efficient and the manifest material [causes] to the resulting form; and likewise the discovery of the *latent schematism* of bodies at rest and not in motion. (NO II.1)

As Bacon explicitly concludes later in Aphorism II.9, he refers here to two pairs of sciences, one, natural magic and metaphysics, and the other, mechanics and physics. To natural magic belongs the primary task and purpose of human power while to metaphysic belongs the primary task of human knowledge. Correspondingly, the secondary task of human power belongs to mechanics whereas the secondary task of human knowledge belongs to physics. To put this in more precise terms, natural magic applies that upon which metaphysics speculates—forms, also known as "simple natures," "true specific differences," "nature-engendering natures," and "sources of emanation"—changing one form into another within any given body.[17] Likewise, mechanics works upon the latent processes and schematisms discovered by the speculative counterpart physics, accelerating, decelerating, and diverting processes and manipulating schematisms as they occur within a given body.

This schematic cleaves operative and speculative sciences, but, as Bacon reminds readers, the descending and ascending roads of inquiry are "more or less the same," for "what in knowledge has the most use, that in knowledge has the most truth" (NO II.4). A difference between the two pairs arise, though, over their content. Bacon asserts that "nothing truly exists in Nature except separate bodies performing separate pure actions, in conformity with a law" (NO II.2). The ultimate aim of the highest branch of natural philosophy, and thus of natural philosophy as a whole, is those laws, but the aim of physics and mechanics is knowledge of separate bodies performing separate actions. With the latter knowledge, one can "make new discoveries on a substance to some extent similar and suitably prepared, but he does not move the more deeply fixed boundary of things." With the knowledge of the laws or forms, however, one can move the boundary and "uncover and produce effects that have never been produced before" either by nature or experiments (NO II.3).

The prolongation of life is not, in Bacon's terms, a direct object of metaphysics and natural magic, but an indirect object, because the form that Bacon seeks to preserve is "human being," a

[17] By "emanation," Bacon seems to mean the transference of powers or virtues from one body to another. In *On Principles and Origins*, he remarks that the true first principle of matter, in this case the atom, must possess, among other things, the power of "emanation" (OFB VI.252-3).

compound form, and he does not seek to superinduce that form on another kind of body, as though he wished to alter an elephant into a human being. The forms investigated by metaphysics are simple natures, not compound. Human being is a compound nature, like lion or water—or compares with one, for its rational soul distinguishes it among compound bodies as possessing a simple nature, a miracle that to Bacon's mind puts investigation of the form "man" off limits (SEH II.565, IV.360). The prolongation of life is not a law of nature, but an activity dependent upon such laws. It benefits indirectly from the discovery of the laws governing pneumatics and tangibles, dense and rare, hot and cold, and, perhaps above all, animate and inanimate. But such laws are discovered in the smallest particles of matter, at the extreme limit of the laws' emergence: "Seeing that every natural action proceeds through the smallest particles, or at least those too small to be perceived by the sense, no one should expect to control or alter Nature unless he has properly understood and noted them" (NO II.6). To prolong life, one needs to know how to perform operations wrought by microscopic particles; for example, how to generate and sustain animation in parts of the body seemingly dead. Metaphysical investigation into the animate versus the inanimate assists such operations. No metaphysical investigation, however, controls the prolongation of life. That is because each time one attempts to prolong life one deals with a concrete body influenced by multiple laws or forms and influenced by those laws or forms to different degrees in different parts. Hence, as Bacon so often demonstrates in his own prescriptions in *The History of Life and Death*, the prolongation of life is a complicated business. It is complicated because it handles concrete bodies, not laws. The discovery of simple forms, on the other hand, moves away from the complicated and toward the things most independent and pure: "The closer the inquiry comes to simple natures, the more intelligible and clear will everything become; the business will be transferred from the complicated to the simple" (NO II.8). But the prolongation of life manages a number of such interrelated simple forms mixed within concrete bodies.

The highest branches of natural philosophy to handle concrete bodies are physics and mechanics.[18] While learning from metaphysic and natural magic about universal forms, physics and mechanics must attend to how those forms operate in more peculiar ways within a particular body or in multiple bodies conjoined into one; "otherwise, [it] will run into fruitless methods, or at least difficult and perverse ones, unsuited to the nature of the body on which [it] is working" (NO II.7). Above all, or below all, physics and mechanics must come to know what Bacon calls latent processes [*latens processus*] and latent schematisms [*latens schematismus*]. Investigation into latent processes and schematisms "does not proceed through simple natures but through concrete bodies, as they are found in the ordinary course of Nature" (NO II.5). Latent process I have mentioned previously: it consists, in Bacon's words, not of visible "steps" in the transformation of bodies but "a continuous process that is largely hidden from the sense" (NO II.6). Before, I discussed how consumption and desiccation are latent processes; Bacon tries to divulge them using a mixture of sensible evidence and axioms concerning spirits and tangible substances. Latent process denotes the minuscule, exceedingly subtle changes within such ordinary, natural actions as generation, nutrition, growth, and sensory impressions. Latent schematism refers, in Peter Urbach's paraphrase, to "a body's hidden, inner structure, or arrangement of parts" (133). All bodies have schematisms, some manifest, others latent. The manifest schematism tends to deceive the senses with a false showing of uniformity, as in "iron," "stone," "root," "leaf," "flower," "flesh," "blood," and "bone" (NO II.7). The latent schematism is the complexity underneath, or the arrangement of the genuinely homogeneous substances discovered, as is any latent process, not by the senses alone but with the refining fire of the intellect known as true induction. Bacon also calls this discovery a "true anatomy," evoking the kind of transformation of understanding that results from opening up a uniform organism such as man and seeing all the various parts inside.

[18] Natural history, and its operative counterpart, experiment, also handle concrete bodies in all their variety. Both, however, fall under physic and are closely related to what Bacon calls in *De Augmentis* "concrete physic," as opposed to "abstract physic."

Latent processes involve latent schematisms, and the combination of the two contributes to the instantiation of forms. For example, schematisms partly determine rarity and density (NO II.230). Rarity and density affect nutrition. Nutrition distinguishes animation (OFB XII.314-7). A list of latent schematisms offered in *De Augmentis* even repeats many of the forms included in the same work: "Dense, Rare; Heavy Light; Hot, Cold; Tangible, Pneumatic; Volatile, Fixed; Determinate, Fluid; Moist, Dry; Fat, Crude; Hard, Soft; Fragile, Tensile; Porous, Close; Spirituous, Jejune; Simple, Compound; Absolute, Imperfectly Mixed; Fibrous and Venous, Simple of Structure, or Equal; Similar, Dissimilar; Specific, Non-Specific; Organic, Inorganic; Animate, Inanimate" (SEH I.560. IV.356). Nevertheless, inquiries into latent processes and schematisms "are directed to what we may call Nature's particular, special patterns of behavior, not to her fundamental, general laws, which constitute forms" (NO II.5). Such inquiries concentrate too closely on an individual object, its components, and its activities to extrapolate upward to forms. Thus, Bacon says that the latent schematisms listed in *De Augmentis* differ from forms, in that "schematism" designates the appearance of the same phenomena in s particular body, not in all bodies. Lower and higher inquiries complement one another, though. Because more careful and particular, the course taken by inquiries into latent processes and schematisms "seems the quicker and nearer at hand, and to offer better hope" than the course down from forms while the "true and clear light […] shed by the primary axioms dispels all obscurity and subtlety" that the lower kinds of inquiries may induce (NO II.5, 7).

Expanding beyond a simple medical practice involving physician and patient, the prolongation of life entails, for Bacon, physical and mechanical inquiries into both the latent processes involved in the human body—growth, nutrition, consumption, desiccation—and the latent schematisms of the subordinate substances involved in those processes—mortual and vital spirits, bone, flesh, organs, etc.—whereby discoveries are expanded and confirmed by the higher inquiries of metaphysic and natural magic. As a project of natural science, the prolongation of life is its noblest effort, yet, almost paradoxically, not its highest intellectual achievement. From early in Bacon's scientific career, the unpublished manuscript *Valerius Terminus* echoes the passage from "Orpheus"

given above: "Natural philosophy proposes to itself, as its noblest work of all, nothing less than the restitution and renovation of things corruptible, and (what is indeed the same thing to a lower degree) the conservation of bodies in the state in which they are, and the retardation of dissolution and putrefaction" (721). By the standards of "Orpheus" and *Valerius Terminus*, the prolongation of human life represents one instance of each the most and second-most noble works; most noble, when an aged body is renewed; second-most noble, when the normal course of senescence is slowed. Because the human body is the most compounded of all bodies and therefore most potent (as Bacon says in "Prometheus"), its restitution and conservation would seem to excel those of any other kind of body as well. Yet in *Novum Organum* II.1 he designates as the primary tasks of power and knowledge to supreinduce and understand simple natures, not to restore corruptible things, whether the human body or not. The discrepancy accents the difference in his great instauration of sciences between works as "pledges of truth" and works as "comforts of life." As Bacon says in the *Novum Organum*, "works themselves are of greater value as pledges of truth than as comforts of life" (NO I.124). "The very contemplation of things as they are […] is in itself more praiseworthy than all the fruits of invention" (NO I.129). Just as there are some experiments that are "light-bearing" and others that are "fruit-bearing," works in Bacon's methodology may stand for either effects confirming and denying theories or inventions that ameliorate the estate of mankind. The former surpass the latter. In his practical version of philosophy, works are needed to contemplate; their light illuminates the path of ascent to new theories and more experiments. But they also may enable charity. Bacon occasionally calls works of this latter variety—the fruitful kind—"alms." The prolongation of life is the greatest alms that the new natural science can bestow on mankind. Hence, his list of "Magnalia Naturae" represents not simply the loftiest and most comprehensive discoveries to which the human mind can attain but the discoveries "especially directed toward human uses" [*praecipue quoad usus humanos*] (SEH III.167). The discoveries of metaphysic always remain higher because they are the most abstract and far-reaching.

Though noble for its charity, the prolongation of life is a lower-order endeavor of the mind. It is lower, because it pertains more to "concrete bodies" and "Nature's particular, special patterns of behavior" than to forms and laws. Its discovery traffics more in the secondary tasks of power and knowledge than in the primary, for it seeks the transformations of material substances within the bounds of possibility. Most directly, it deals with latent process, or a number of latent processes that coalesce into the phenomenon that we recognize as senescence. Within these kinds of processes its investigation must penetrate to what any study of physics and mechanics considers: "what is lost and given off, what remains, and what is added […] what is expanded, what contracted; what is united, what separated; what is continued, what cut-off; what impels, what impedes; what dominates, what yields" and, more generally, "what occurs before, what after; what is quicker, what is slower; what produces motion, what checks it" and anything else a certain process may entail (NO II.6). Any such process comprises tiny particles whose powers and interactions vary with their schematisms, especially with their density and rarity, the first pair of forms that Bacon enumerates in any list of forms he provides. A couple of sentences about inquiries into latent schematisms in general resonate loudly for the particular investigation into life and death:

> We should try to find out how much spirit there is in every body, and how much tangible essence; and as to that spirit, whether it is abundant and swelling, or meager and scanty, tenuous or denser, more akin to air or to fire, active or inactive, weak or strong, in advance or in retreat, cut off or continuous, in agreement with external and surrounding objects, or in disagreement, and so forth. And we should make similar inquiries into the tangible essence (which admits of no fewer differences than the spirit), into its surface texture, its fibers and its whole structure; and also into the disposition of the spirit through the bodily mass, with its pores, passages, veins and cells and the rudiments and first efforts of the organized body. (NO II.7)

By bringing to light latent processes and the latent schematisms of the tiny particles involved in those processes, one can slow the normal course of nature that sinks the human body from its prime functioning and condition to the enervation and dryness that marks old age—just as, by slowing nature's course, one can bring to light the latent processes and schematisms that direct it. The discovery happens by the doing. Still, as Bacon says, "human power can never be set free from the ordinary course of nature" except by knowledge of forms (NO II.17). To make stupendous,

unprecedented advancements in the prolongation of life, one requires the knowledge of forms. One must be able to convert, for instance, what is rare to what is dense, what is hot to what is cold, what is inanimate to what is animate, or vice versa. Through the painstaking experiments of physics and mechanics, one may learn how to make these changes to some degree and upon specific materials within the human body; however, unless one understands the form of the simple forms one handles, he will never know whether he has hit the boundary of the possibility of a body's transformation. Thus, he will never know if one has reached the maximum extent of human life. As always for Bacon, forms draw the lines between natures and determine the limits of human power (NO II.4).

Though of lower order, the prolongation of life is profoundly difficult all the same. The greatest difficulty in stretching life to its full extent would seem to reside in the complexity of the human body. The most compounded of compound natures, the human body consists of many other compound natures that themselves consist of many simple natures operating in conjunction. For example, the human body contains flesh, muscles, nerves, bones, and organs, and each of those comprises various degrees of hardness and softness, heat and cold, moistness and dryness, and so on. The complexity of concreteness perhaps makes the task of prolonging life even more difficult than that of defining any one of those simple natures, which are more detached. To adjust an individual part to the right degree of a simple nature without forcing its other simple natures into wrong degrees or damaging other parts poses an obstacle to which Bacon in *The History of Life and Death* already attests.

Ultimately, this difficulty boils down to the nearly impossible, if not totally impossible, effort to stem natural dissolution, which according to Bacon is rooted in the consumption enacted by tiny bodies of matter, within every component of the human body. That would not be as difficult, but still maybe impossible, if the effort were directed toward preserving the human body in state. Then we could just encase it amber, preventing the consumption by outside forces for eons, as Bacon notes has happened with insects (OFB XII.168-9). But Bacon wishes to prolong the human body in life, and life depends upon some of the same forces that ultimately corrupt the human body. The air and spirits

that consume its tangible substance also sustain it. The process of natural decay, according to Bacon, underwrites all material aggregate within the realm of the earth. Eventually any material aggregate here erodes, however hard or dense it begins (NO II.33). The subtle operations of spirits, which in many ways impel the dynamics that diversify the earth more than other realms, undermine the material structures in and through which those dynamics take place. Fully undermined, those structures dissolve. They lose their recognizable shape while their even smaller constituents adopt new shapes. Once dissolved, these structures, which are not necessarily living, "die."

"Death," for Bacon, sometimes denotes the loss of a recognizable shape or arrangement of parts, the outcome of natural dissolution. It is the dissolution of a schematism. In the present disposition of the cosmos, even the simplest schematisms, which are nevertheless arrangements of particles, experience corruption and death. Of possible barriers to the reinstatement of a deathless, Edenic paradise, Bacon speculates less upon the trouble of managing multiple natures at one time than upon the trouble of resisting the decay and disintegration of any one schematism. The clearest example appears in *On Principles and Origins According to the Fables of Cupid and Coelum*, written somewhere between 1610 and 1620. In a number of texts written in the last two decades of his life, Bacon speculates about the origins and limits of matter, and his thoughts are often, as here, circumscribed by theology. The passage in question is the same that Rees invokes to cement his argument that, for Bacon, theology sets boundary conditions for natural philosophy. Bacon indicts the philosophy of Telesio of being, in addition to "pastoral" and "artless," gravely mistaken about the eternality of matter, something that divine revelation has clarified. Persons such as Telesio and his forebear Parmenides, using solely the evidence of the senses,

> may assert the eternity of matter but deny the eternity of the world as we see it; and this was the opinion both of the most ancient wisdom, and of the man who comes nearest to it, Democritus. Holy Writ bears witness to the same thing, but with the crucial difference that whereas Holy Writ holds that matter comes from God, the ancient philosophers represent it as something original to itself. For there seem to be three dogmas which we know by faith about this matter. First, we know that matter was created from nothing; secondly, that the elaboration of system was dictated by the word of the Almighty, and not that matter elaborated itself out of Chaos into the present schematism; and thirdly, that this schematism was (before the Fall) the best

> of those which matter (as it had been created) could support. But those philosophers could not rise to any of these dogmas. For they abhor creation out of nothing, and suppose that this schematism was fashioned after many circuitous processes and efforts of matter; and they do not worry about it being the best possible schematism since they claim that it is perishable and variable. In these things, therefore, we must depend on faith and its firmaments. But whether this created matter, through long revolutions of ages, by the power originally given to it, could have gathered and turned itself into that perfect schematism (as it did instantly at the word of command and without circuitous processes) is perhaps something we should not ask. For stealing a march on time is as much a miracle and a mark of the same omnipotence as the forming of being. Now the divine nature seems to have chosen to distinguish itself by both these emanations of omnipotence, in the first place by operating omnipotently on being and matter, that is by creating something out of nothing, and in the second place by operating on motion and time, by anticipating the order of nature and speeding up the emergence of being. But these things belong to the parable of Coelum, where I shall discuss more fully what I now touch on briefly. (OFB VI.250-3)

In this passage, a natural philosophy attuned to scripture agrees with the purely natural on a crucial point of cosmogony: the present arrangement of matter [*Schematismus*] emerged out of a chaos and can perish into that chaos again. Nonetheless, they differ over three points: over the origins of the chaos, or of matter itself, even before it was configured; over the means by which the chaos of matter became configured; and over the possibilities of different configurations. The configuration of matter is its "schematism." Faith teaches that God created matter out of nothing, whereas purely natural philosophy teaches that matter always has and always will exist, sometimes with a schematism, sometimes without. Faith teaches that after creating matter out of nothing God disposed matter into a schematism; purely natural philosophy, that matter out of chaos disposed itself into a schematism. Faith teaches that the first schematism into which God disposed matter was perfect and that after the Fall of Man it slipped from perfection; purely natural philosophy ignores the question of perfect schematism altogether, assuming that any schematism is "perishable and variable." Consequent to Bacon's analysis, the schematism in which we encounter matter today is imperfect. It is prone to a death of sorts. From verses such as Romans 5:12, Bacon interprets the death consequent to the Fall to pervade all the earth—not just human beings, not even just living things, but all formations of matter. A perfect schematism, such as that assumed by matter prior to the Fall, would prohibit its own destruction. It would avert its own decomposition.

The passage provokes the question whether art can restore the perfect schematism operative before the Fall. Perhaps, if it could, living things would not die because their constituent parts would never decompose. We notice that Bacon reserves to divine mystery the creation of something out of nothing and the development of a schematism out of chaos; however, he does not reserve to divine mystery the degeneration of the perfect schematism after the Fall—at least not explicitly. The problem for him, though, derives from both theology and natural philosophy. According to each, the schematisms of matter are corruptible. This mortality, so to speak, is a limit set to the transformation of material bodies alluded to by his phrase "within the bounds of possibility" deployed in Aphorism II.1 of the *Novum Organum*: "transformation of one material body into another, within the bounds of possibility." From theology more particularly, he derives the notion that restoration of preslapsarian Eden would require also the elimination of death in the broader sense. One would have to arrange the absolutely smallest particles of matter into incorruptible schematisms and forthwith countermand God's edict of death consequent to the Fall. Combined, this would amount to re-adjusting the frame of the cosmos so that all schematisms at or near the earth—schematisms of air, water, oils, metals, minerals, or of anything whatsoever—can withstand their programmed corruption.

It is hard to believe that Bacon expected all that to happen even with natural science at its acme. A complete recovery of Eden would seem to be impossible because of the disposition of matter. Schematisms break down or "die," and, ultimately because of that, the human body decays and dies. The complexity of the cosmos would elude human efforts to master it, just as the complexity of the microcosm, the human body, would. Furthermore, because the human body interacts with the world surrounding it, absorbing and expelling again materials that are the source of both its vitality and its death, the limitations in one field of endeavor would carry over to the other.

Another question provoked by this passage is what differentiates matter with schematism from matter in chaos. If even tiny particles of matter possess schematisms, as Bacon indicates elsewhere, what does it mean to remove schematism from matter? This question concerning the nature of the smallest particles points to atomic theory, something Bacon wrestled with in the last two

decades of his life. Although I think that to Bacon's mind the deeply entwined complications of life and death would pose too great an obstacle to make earthly mortality possible, it is worth looking at passages where he discusses the farthest limits of matter—its smallest size and the extent of its transformations—for what they signify about how ultimately he conceives metaphysic and natural magic to work. Metaphysic and natural magic are limited by the objects that they examine and manipulate. Those objects are destructible forms, determined in part by equally destructible schematisms of matter. The studies of metaphysic and natural magic are barred from the study of the one naturally "deathless" item upon the earth, the atom.

As scholars have observed, Bacon adhered to a doctrine of atomism at some point in his career if not through all of it.[19] He evinces the most confidence in atomism in some early manuscripts. By 1620, however, he had grown wary of the notion of the atom, which earlier he had defended. In texts such as "Cupid, or the Atom" and *Thoughts on the Nature of Things*, he defends the notion of the atom as a limit to the theoretical analysis of matter into ever smaller parts. Though not necessarily abandoning the idea of a smallest quantity of matter, he lost confidence in atomism, seemingly because of the recognition that atoms would not be very useful to science. In the *Novum Organum*, published in 1620, he complains that men "never stop abstracting Nature until it becomes potential matter, without form; and, on the other hand, never cease from dissecting Nature until the arrive at the atom, things which, even if true, can be of little help to the welfare of mankind." Bacon presents the abstraction and dissection that he indicts here in order to exemplify the point that, currently, natural philosophers fly to "first principles and the ultimate parts of Nature," skipping over

[19] Three questions regarding Bacon's atomism have vexed scholars: Was he ever an atomist? If so, when? And again if so, what kind of atomism did he advocate? On the one hand, scholars such as Robert Kargon and Graham Rees have doubted or flatly denied Bacon's commitment to atomist theory. The more skeptical of the two, Rees argues that Bacon rejected basic tenets of atomism but made use of the theory in some early writings because of affinities between Democritean subtlety and his own inductive method of inquiry. On the other hand, Peter Urbach and Benedino Gemelli, writing after both Kargon and Rees, have claimed that Bacon's ideas about atomism changed during his career but never to the point of abandoning an atomism of some kind. See Robert Kargon, *Atomism in England from Hariot to Newton* (Oxford: Clarendon Press: 1966), 43-53; Graham Rees, "Atomism an 'Subtlety' in Francis Bacon's Philosophy" *Annals of Science* 37 (1980): 549-571; Peter Urbach, *Francis Bacon's Philosophy of Science* (La Salle, IL: Open Court, 1987), 72-82; and Benedino Gemelli, *Aspetti dell'atomismo classico nella filosofia di Francis Bacon e nel Seicento* (Florence: L.S. Olschki, 1996).

the intermediates upon which "everything of practical utility depends" (NO I.66). Though charging off in different directions, one up toward more comprehensive rules and the other down into the smallest particles of matter, abstraction and dissection wind up in the same fruitless place, at principles which are too general to do any good. Bacon presents his new instrument of logic, by contrast, as reorienting natural philosophy toward intermediate axioms, which guarantee abstractions by works.

Previously, Bacon had elevated a certain kind of atomic theory over Scholasticism because Scholasticism inculcated the concept of potential matter (SEH III.19, V.423; OFB VI.206-7). Potential matter is matter without form, form depending for Bacon upon the powers and structures endowed in small parts of matter that determine how they behave. In these earlier texts, the atomic theory that Bacon approves is largely his own invention although he purports to extract it from the myth of Cupid, which he explicates twice, once in *On the Wisdom of the Ancients* and later in the manuscript *On Principles and Origins*, with some variations between the interpretations. In both texts, Bacon first aligns himself with the classical materialist Democritus but soon reaches beyond his ideas. In both, Bacon lauds Democritus because Democritus took first principles of matter and divested them of the properties of the elements fire, air, water, and earth or of the sensible qualities possessed by larger compounds. The rest of the classical materialists, according to Bacon, were enchanted by the elements, assigning to the principles of matter one or another of their properties. Instead, Democritus agreed with the even more remote "ancients," who had disguised their doctrine of atomism, the right doctrine, in the story of Cupid. Cupid, or the atom, was traditionally represented as naked, Bacon explains, in order to signify the want of sensible properties often associated with the four elements and compounds (SEH VI.656, 731; OFB VI.203-3). The agreement between Democritus and the ancients ends there, however. In Bacon's view, none of the elements can account for all of nature's effects. The atom of Democritus is guilty of the same charge. Democritus reserved to the atom only two "desires," one a "primary motion simply and absolutely" and the other a motion "by comparison." Atoms move toward the center of the world but at speeds

variable by weight (SEH VI.655-6, 730). Certainly, Bacon opines, Democritus reasoned better than his followers Epicurus and Lucretius, who assigned to the atom the ludicrous motion of the swerve. Nonetheless, his reasoning was still too "narrow" and "framed with reference to too few particulars." Like the atomic swerve, centripetal motion at variable speeds cannot account for certain facts, in this case the circular motion of the heavens and the phenomenon of expansion and contraction. All the classical atomists, including Democritus, conceived of the atom in such a way as to elide it with the Scholastic notion of potential matter (OFB VI.202-3; SEH VI.656, 730; SEH III.18, V.422-3). Their atomic motions were too simple. Like the "abstract and passive" potential matter of Scholasticism, their atoms were not active enough (OFB VI.206-7).

The atoms of the ancients were, though. While interpreting the myth of Cupid, Bacon suggests another kind of atomism based upon a "virtue" innate to atoms that enables them to operate upon one another across void. The atom's natural motions or desires are Bacon's primary concern in his glosses on Cupid. In *De Sapientia Veterum*, Cupid represents "the appetite and instinct of primal matter" or the "natural motion of the atom" which is "the original and unique force that constitutes and fashions all things out of matter" (SEH VI.655, 729). In *De Principiis,* Bacon says that, according to the ancients, matter had "form and properties" (OFB VI.206-7). Matter "was active, had some form and imparted its form, and had the principle of motion within itself" (OFB VI.208-9). Moreover, the right theory of matter maintains, with the ancients, that "primary matter is united with the primary form, and also with the first principle of motion, as we find it" (OFB VI.208-9). In Cupid's arrows, Bacon discovers a sign of the atom's embedded principle of motion. The arrows indicate that the atom works from afar. Any theory of atom and vacuum must hold that the atom works at a distance, Bacon asserts. Otherwise, "all things would remain fixed and immovable" (SEH VI.656, 731).

Classical atomism explained the congregation of atoms by random concourses. Bacon's atomism explains the same thing through the atom's innate virtue of attraction. In the gloss for *De Sapientia Veterum,* Bacon concludes with an interpretation of the two Cupids, one elder and born of

Night and the other younger and born of Venus. The elder Cupid, the atom, with whom the gloss begins, is "the source of all exquisite sympathy." The younger Cupid, who could not start his work "until the species were constituted," derives his power from the elder and expresses some conformity with him: "For Venus excites the general appetite of conjunction and procreation; Cupid, her son, applies the appetite to an individual object." Venus produces "the general disposition," and the younger Cupid, "the more exact sympathy" (SEH VI.656-7, 731). Although confusing, this final paragraph evinces, if nothing else, that atoms possess virtues of sympathy and conjunction. Why atoms would come with ready-made preferences is a mystery, but a mystery recognized as such by Bacon. He tells that Cupid often is represented as parentless, a fact that he construes to mean that Love, or "the appetite or instinct of primal matter," has no cause. His equation of Cupid with Love suggests the atom's virtue of attraction. Love is the "natural motion of the atom" and "the original and unique force that constitutes and fashions all things out of matter." It enables the congregation of matter, but it itself has no cause, at least not one that can be discovered "by nature" or "by way of cause." It is the "cause of causes" next to God, who activated matter at the creation and endowed the atom with its unique, natural motion (SEH VI.655, 729). God is its only cause. However, Bacon also cites other accounts whereby Cupid is "an egg hatched by night." He deciphers that story to mean that not only does the atom exist against reason's ability to apprehend its origins, its operations, or how it works once it is born, also elude human art and understanding: "That the method of its operation should ever be brought within the range and comprehension of human inquiry, is hardly perhaps to be hoped" (SEH VI.655, 729).

In this last remark we hear a foreshadowing of Bacon's complaint against atomic theory in the *Novum Organum*: if real, atoms are still useless. The words "hardly perhaps" open a chink in an otherwise absolute claim. Still, in later years Bacon did not widen the chink but narrowed it. We can see why if we look a little more closely at the final paragraph of the Cupid gloss in *On the Wisdom of the Ancients*.

One of the confusing parts of the paragraph is what the distinction between the elder and younger Cupid allegorizes. The younger Cupid works more precisely than the elder, yet he did not become active till the constitution of species. He was born of Venus, who incites a general disposition as opposed to the more individualized sympathies incited by himself. Even so, the elder Cupid exerts a powerful influence; he is responsible for the "principles more deep and fatal" that underwrite the younger Cupid's "particular sympathy." What Bacon refers to by the distinction is stated more explicitly in another unpublished manuscript dealing with matter theory, *Thoughts on the Nature of Things*. This work, too, begins with partiality to the atomic theory of Democritus. Bacon rejects a diversity of atoms, preferring instead an identity of atoms, because a basis of many kinds of atoms would prohibit the transmutation of substances. An identity of atoms would enable transmutation although, to be sure, only with great difficulty. Moments later, however, Bacon confers to mixed bodies the impediments first said to be posed by atoms:

> The proper question is whether all bodies do not likewise pass through regular circuits and intermediate changes. For there is no doubt but that the seeds of things, though equal, as soon as they have thrown themselves into certain groups or knots, completely assume the nature of dissimilar bodies, till those groups or knots are dissolved; so that the nature and affections of compound bodies may be as great a hindrance and obstacle to immediate transmutation as those of simple. (SEH III.18, V.422)

The "groups" [*turmas*] or "knots" [*nodos*] into which the seeds of things, or atoms, entangle themselves practically efface the original atoms constructing them. They come to possess affections as nearly as hardened and commanding as those of atoms themselves.

It is these knots to which the allegory of the younger Cupid refers. The "compounds" [*composita*] and "dissimilar bodies" formed out of individual atoms have a "nature" and virtues of their own—a great many more virtues than atoms have, in fact—that virtually dissolve the affections of the atoms. The affections of the atoms are never absent, just hidden more deeply. Like the elder Cupid, they work in the dark, ultimately responsible for the behaviors of the knots and of even larger compounds but in ways that human inquiry may never find.

These knots are also equivalent, I believe, to the schematisms of matter mentioned in the long passage from *On Principles and Origins* given above. In chaos, matter exists dispersed into atoms and void, but through the intervention of either God (the divine power working immediately) or Venus (the natural attraction of atoms working much more gradually) it merges into schematisms. It fashions compound bodies of varying shapes, structures, and powers that influence to one degree or other the forms, such as dense and rare, heavy and light, hard and soft, that in turn constitute even larger, more dynamic compounds. For Bacon, the key to transmuting and restoring material bodies is to gain control over knots rather than atoms. More than likely, atoms will always remain beyond the grasp of human control and understanding, as Bacon suggests as early as "Cupid, or the Atom."

Nevertheless, because that allegory makes much of the atom's unique status as the only thing enjoying "perpetual infancy" and the only thing "properly naked," it would make sense, perhaps, if the means to transmuting and restoring bodies were to reel them all the way back to their atoms and somehow by controlling atomic operations change and refresh the bodies that they compose (SEH VI.656, 730-1). Such an explanation might prove especially tempting for us, who have borne witness to nuclear physics. But one must keep in mind that the atomism that Bacon endorses when he most clearly endorses one rests upon the principle that atoms exist in identity, are all the same and equally naked, not varying like our hydrogen, helium, and carbon atoms. In Bacon's opinion, furthermore, only an identity of atoms makes possible transmutation, because only then can any one substance be converted into any other substance no matter how remote and tiny the difference (SEH VI.655-6, 730-1). To Bacon's reckoning, substances differ by the ways atoms collect and arrange themselves, not by the kinds of atoms they contain.

As the figure of the younger Cupid implies, to transmute and restore substances, one must learn how to manipulate not individual atoms but the equally potent desires of the smallest composite things. I think Bacon takes this view because of two complementary doctrines: the forces of the knots composed from atoms propel corruption, and in the middle region of the cosmos that we inhabit atoms do not exist in isolation but always in knots. The knots into which atoms merge necessitate

turmoil and, subsequently, the conversions of compound natures into other compound natures, especially through the process of consumption. Bacon's doubt about the human ability to control atoms translates into doubt about the human ability to restore prelapsarian schematisms that would endure against the tendency of matter in its present schematisms to break down.

The two doctrines, that the knots of matter propel corruption and that atoms do not exist in isolation, appear in certain etiological fables featured in *On the Wisdom of the Ancients*. In "Cupid, or the Atom," destruction enters the cosmos when compounds congeal from atoms. Anything larger than the atom—any compound however small—is "affected by age" and "clothed" by multifarious tendencies (SEH VI.656, 730-1). Atoms existed in isolation before the creation of the world, but the creation, which fitted atoms into composites, introduced the consumption and death of matter.

This cosmogony is further elaborated in "Coelum, or the Origin of Things," another gloss in *On the Wisdom of the Ancients*. At the end of the long passage from *On Principles and Origin* that I gave above, Bacon says that he will elaborate his interpretations in a later gloss about Coelum. Bacon never completed that gloss; however, the earlier construction of the Coelum myth in *On the Wisdom of the Ancients* helps to explain, while it also complicates, the mortality of composites, or knotted matter. As mythography, "Coelum" retains some of the discrepancies witnessed in *On Principles and Origins* between a purely natural theory of cosmogony and a theological one; however, it elides the difference underscored by the later work between nature's disposal of matter into schematisms and God's. Matter is eternal although the world is not, and matter existed before the six days' work of creation when God gave it "form" [*formam*]. So, Bacon observes, the ancient fable regarding the succession of Coelum, Saturn, and Jupiter agrees more or less with Democritus's point that matter is eternal but the world mortal, a point that verges "somewhat nearer to the truth" of Holy Scripture than do some of Democritus's other points (SEH VI.649, 723).

Bacon deciphers the figure Coelum as "the concave or circumference which encloses all matter" and the figure Saturn as "matter itself" [*materiam ipsam*] (SEH VI.649, 723). Jupiter, to whom Bacon does not assign another value explicitly, seems to stand in lieu of the Hebrew and

Christian God. The concept of a single *deus* infiltrates the gloss as Biblical verses pepper "Cupid, or the Atom." Jupiter's deliberate and instant organization of matter affiliates him more with the scriptural God than with the pagan Nature, the two figures whom Bacon more carefully differentiates in *On Principles and Origins*. Like the God of Holy Scripture, Jupiter adjusted pre-existent matter into forms. When left to his own devices, the earlier king, Saturn, made "mere attempts at worlds," always trying and failing because of matter's conflicted "agitations and motions" (SEH VI.649, 723). A world could not be maintained until "a fabric [*fabricam*] was turned out which could keep its form," an event transpiring under the reign of Jupiter (SEH VI.649, 723-4). Jupiter organized matter by force and violence. He thrust Saturn and the "continual and transitory changes" of matter into Tartarus, "the place of perturbation." As in "Cupid, or the Atom," though, Tartarus does not signify some region below us but the very region that we inhabit, for it lies "midway between the lowest parts of heaven and the innermost parts of the earth." This "middle region" into which Jupiter settled matter then subjects matter to new experiences: "perturbation and fragility and mortality or corruption." (SEH VI.649-50, 724).

Corruption and death set in when the pre-existing atoms that have flailed around since Saturn's reign were arranged so as to keep form [*formam*] (SEH VI.649, 724). "Form" here looks forward to "Cupid, or the Atom," which occurs five chapters later, for it indicates the same thing as "species" [*species*] there. The constitution of species precedes the invigoration of the younger Cupid. Venus, as the mother of the younger Cupid, would seem to impose the species under which her son acts. Indeed, Bacon tells us in "Coelum" that Venus was not born until Jupiter imprisoned Saturn and that she was instrumental in establishing and preserving matter's new forms. Under Saturn, discord predominated, and thus no change occurred "except by the whole together." With the birth of Venus, however, concord predominated, and so, now, "change proceeds part by part only, the total fabric remaining entire and undisturbed" (SEH VI.650, 724). Matter now keeps to different species, but gradually corruption forces it to pass out of one species and into another, but without diminishing its total sum. The introduction of Venus limns poetically the first of the mobile canons in *The History of*

Life and Death: "Consumption does not happen unless what is lost from one body takes up residence in another" (OFB XII.346-7).

The myths of Cupid and Coelum disagree with Bacon's remarks in *On Principles and Origins* over one notable point of interpretation. According to Bacon's pagan, naturalizing allegories, death and corruption entered with the evolution of matter into forms or species. According to his commentary in *On Principles and Origins*, though, death and corruption entered with the Fall, a later episode when schematisms already existed. Bacon's mythographies exhibit his struggle to reconcile evidence of the senses with the evidence of faith. Significantly, Bacon reiterates the latter thesis in "Pan, or Nature," when he treats the story of Pan's birth from Jupiter and Hybris (Insolence) as an allegory that "might make one think" that the Greeks were informed of "Hebrew mysteries," revealing as it does "the state of the world, not at its birth, but as it was after the fall of Adam, subject to death and corruption" (SEH VI.636, 709).[20] From the notion heard in verses such as Romans 5:12 that with the Fall death entered the world, he extrapolates that the Fall induced not only the deaths of men and women but the corruption and "death" of composite bodies of all kinds. This gloss on Pan reinforces my earlier position that the prelapsarian schematism was indestructible, while the phrase "might make one think" foreshadows Bacon's insistence in *On Principles and Origins* that through divine revelation Christians are privy to aspects of cosmogony unbeknownst to philosophers who decipher merely by their senses. Still, even his readings of "Cupid" and "Coelum" agree with the supposedly revealed doctrine that all composites made from atoms are corruptible as long as they maintain schematisms existing in the cosmos as we know it.

The atom would seem to hold the key to the invincibility of matter, for, unlike collections of atoms bound within postlapsarian schematisms, it enjoys perpetual infancy, as Bacon asserts in "Cupid, or the Atom." It is always in a state of newness. That does not mean it is absolutely indestructible, of course, for in this gloss, as in the gloss upon Cupid in *On Principles and Origins*,

[20] Bacon retains this line in the revision and expansion of the fable in *De Augmentis* (SEH I.521-30, IV.318-27).

Bacon avows that the divinity can annihilate matter. Naturally, matter cannot be destroyed even if its forms and compounds can be, an idea tantamount to Bacon's early defenses of the atom as the theoretical limit to the division of matter. Consumption happens to all knots but not to the atoms that constitute them; atoms ensure that "the sum total of matter remains always the same and the absolute quantum of nature suffers neither increase nor diminution" (SEH VI.649, 723). Things cannot disintegrate into nothing except by the miraculous handiwork of God. As evidence that Bacon may have retained the doctrine as a theoretical limit to matter, in later writings he often repeats the principle of matter's constant quantity, though not always citing the divine exception (SEH II.302, V.398; OFB XII.346-7).

Atoms pose problems for Bacon, however, especially in his later writings. Two problems emerge most clearly in Aphorism II.8 of the *Novum Organum*. Bacon contends that as physics and mechanics penetrate down to latent schematisms, "we shall be led not to the atom, which presupposes a vacuum and immutable substance (both of which are false), but to real particles, such as are found." By 1620, if not before, he may retain the atom as a theoretical limit to the division of matter, but he rejects atomism as he thinks it is conventionally understood. Instead of atoms as conventionally understood, he offers "real particles" [*particulas veras*]. Real particles exhibit quality that classical atoms do not: they possess innate virtues. Because of those, they resemble the atoms that Bacon credits in "Cupid, or the Atom." Like those, real particles appear at the limit of the division of matter. They are the smallest constituents of matter, but possessing active qualities. But here Bacon adds something he does not say or suggest in the earlier text. Real particles obviate vacuum.

The denial of a vacuum actually occurring in nature is important. It means that real particles, or active atoms, cannot be isolated. They cannot be isolated for the same reasons, I believe, that Bacon thinks vacuum does not actually occur in nature—the native attractions of the real particles themselves and the disposition of the cosmos.

In the various texts in which he discusses atoms, Bacon often entertains the idea of a vacuum, but over the years his opinions about it underwent a similar revision. In *Thoughts on the Nature of*

Things, he argues for the existence of vacuum along with the atom—or at least for an interspersed vacuum as opposed to a collected vacuum—deducing its necessity *reductio ad absurdum* but finding sensible evidence for it too, and even allows that a collected vacuum might exist (SEH III.15-17, V.420-1). After largely ignoring the problem of vacuum in *De Principiis,* in the *Novum Organum* he replaces vacuum in most cases with "folds of matter" [*plica materiae*]. Folds are occupied by pneumatics, either common air or spirits. He promises that he "will not affirm for certain whether there is a vacuum, either concentrated in one place or spread throughout a body." Yet in the same extended aphorism he later denies that vacuum exists in bodies as commonly experienced. In most cases, the assumption of vacuum is unnecessary, for the folds in matter containing air and spirit are evident. Vacuum operates "only in the extreme limit […] of rarefaction" (NO II.48).[21] Vacuum is a mistaken solution to the riddle of density and rarity, a riddle which Bacon thinks spirits and air solve more easily. Vacuum was the solution given by the classical atomists Democritus and Leucippus, who introduced it (he says) to explain how bodies can expand or contract space while maintaining weight. Bacon deems their explanation emphatically "wrong." Not only does he consider folds evident to the senses, he balks at the idea of rarity increasing in proportion to the amount of vacuum. Because invisible and weightless, spirits can account for the same phenomena, as is manifest "from the very great strength of pneumatic bodies (which would otherwise be swimming about in a vacuum like fine dust) and by many other demonstrations" (NO II.48). If spirits are evident and vacuum is not, the supposition of vacuum to account for rarity and density becomes superfluous.

Yet Bacon maintains the possibility of vacuum in the extreme case, "in the extreme limit […] of rarefaction" (NO II.48). Building toward that use, he argues that if sensible substances such as air or wood tried to contract into substances more dense than themselves such as water or stone or, conversely, if the more dense substances tried to expand into ones more rare than themselves, there "would be no need" to defer to the two causes that Schoolmen would insert here—the motion that

[21] This quotation is neglected by Rees as well as Urbach, who nonetheless take divergent opinions about Bacon's belief in the existence of atoms.

"forbids interpenetration of dimensions" and the motion that "denies a vacuum," respectively—and, moreover, those substances themselves would acquire levels of density and rarity that we do not see them acquire. "The matter therefore comes down to penetration of dimensions and a vacuum," Bacon concludes, "only in the extreme limits of compression and rarefaction […]"

I have given only the first part of his conclusion. Perhaps from it we are to infer that only when a body is compressed or expanded enough to sever bonds between real particles (atoms) and thereby to isolate a real particle (atom) do the motions against penetration and vacuum come into play. The trouble is that Bacon already has supplanted the Scholastic doctrines of matter's aversion to penetration of dimensions and abhorrence to vacuum with two other motions that he thinks more truthfully define matter's behaviors. What he dubs Resistance of Matter replaces the prohibition against the penetration of dimensions, and what he dubs Motion of Connection replaces the abhorrence of vacuum. Matter desires to hold itself intact and to maintain connections with other matter.

The sentence continues, "[…] whereas these motions stop far short of those limits, and are just the desires of bodies to preserve themselves in their consistencies (or if they [the schoolmen] prefer, in their own forms), and only depart suddenly from them [i.e., their consistencies] if they are altered by gentle means and by consent." More clearly, Bacon concludes that short of the extreme limits of compression and rarefaction the desires of bodies to maintain themselves in their own consistencies predominate over the motion that forbids interpenetration of dimensions and the motion that denies a vacuum. Less clear is where vacuum does occur if a body's motion for self-consistency obviates the motion against vacuum. Vacuum would seem to be more potential and imaginative than actual and real. For instance, atoms and void seem to linger covertly in the theory of rarity and density described above. Bacon insists that spirits and air fill the folds of grosser substances. In *The History of Dense and Rare* and other texts, though, he also speaks of spirits and air as being rare and tenuous themselves. What occupies their folds? More spirits and pneumatics? To stop an infinite regress, a pairing of an atom—in the sense of a limit to material divisibility—and vacuum is

necessary. Thus, by another path, a more hypothetical one, we perceive vacuum at the extreme limits of rarefaction.

The existence of the atom remains an hypothesis for Bacon, however. According to his cosmology, elaborated most clearly in *A Theory of Heaven*, the middle region, earth, contains tangible bodies with pneumatics thoroughly mixed inside them. The region above, the heavens, contains pneumatics "virtually unmixed" with tangibles. The region below contains, as best he can surmise, tangibles virtually unmixed with pneumatics. Because Bacon holds that the densest pneumatic is still rarer than the rarest tangible, one can see that his cosmology is built, from top to bottom, on a scale of increasing density. According to *The History of Dense and Rare* and Aphorism II.8 of the *Novum Organum*, vacuum appears nowhere on this scale (SEH II.303, V.389). In the lengthy Aphorism II.48, however, he entertains the possibility of vacuum, for he doubts the invincibility of the Motion of Connection. That doubt depends upon his hesitation to affirm whether or not a vacuum exists. The Motion of Connection is the second that Bacon enumerates; he defines it as the motion "whereby bodies [*corpora*] do not allow themselves at any point to be separated from contact with another body [*a contactu alterius corporis*]" The first motion, the Motion of Resistance, by contrast, "exists in every single portion" of matter and is "altogether adamantine and invincible." Because of the Motion of Resistance, the smallest portions of matter will not be reduced to nothing. Self-preservation is an absolute and universal action of matter operative in every particle. The strength of the Motion of Connection, however, depends upon whether or not vacuum exists. If vacuum does exist under the current cosmic disposition, the smallest portions of matter can be separated from one another, permitting void to emerge between them. If not, the Motion of Connection is absolute and universal for at least as long as the cosmos holds its configuration.

As in the "Coelum" and "Cupid" chapters of *On the Wisdom of the Ancients*, Bacon raises the possibility that atoms can be disjoined; however, he favors the hypothesis that they cannot be. At worst, he denies the possibility of vacuum, but at best he "will not affirm for certain" whether there is one. Under the hypothesis at work in these myths, vacuum cannot exist within the present framework

of the cosmos. Neither can the isolated atom. In the cosmos framed by God out of chaos, vacuum does not collect in other zones or between zones, and it does not fill the interstices of our own. It cannot emerge where God has compressed matter to such a degree that the attraction of particles and bodies can easily overcome the separation imposed by void. The attraction of atoms, so long as they are confined into a cosmos, forces their conjunction. Vacuum is not a factor in such a plenum. The idea of abhorrence of vacuum, as Bacon avers in a passage from the *Novum Organum* given above, mistakes a positive force on the part of bodies for a negative force involving something (or a nothing) that may not exist. Eighteen of the nineteen motions outlined in Aphorism II.48 of the *Novum Organum* pertain to the schematisms and compounds formed by atoms. After the first motion, the Motion of Resistance, the activity of the individual atom, and the void presupposed by it, are largely moot.

In fact, if one assumes an identity of atoms, forms as Bacon so unusually charges the word—"dense, rare, hot, cold, heavy, light, tangible, pneumatic, volatile, fixed, and the like" (SEH II.566, IV.361)—can subsist only in bodies compiled by atoms, but not by individual atoms. Likewise, consumption and corruption happen only to compounds, not to atoms. What Bacon considers the highest kind of natural knowledge, and the key to unlocking the power to transmute material bodies and restore them as fully as possible, all of which he assigns to metaphysic and natural magic, involves the understanding and manipulation of forms. In other words, it involves the understanding and manipulation of those smallest "knots" that atoms build and that all but dissolve the active virtues of the atoms constituting them.

Accordingly, in *On the Wisdom of the Ancients*, when Bacon makes pronouncements about transmuting and restoring matter, he does not say that one must understand how atoms themselves work. For Bacon, understanding that would entail the ability to make atoms behave differently than they do by nature. It would require, for instance, the know-how to force atoms to align in wholly new ways or to attract at different strengths. "For the summary law of nature," Bacon claims in his gloss on Cupid, "that impulse of desire impressed upon the primary particles of matter which makes them

come together, and which by repetition and multiplication produces all the variety of nature, is thing which mortal thought may glance at, but can hardly take in" (SHE VI.730). Atoms are the bedrock of his natural philosophy, the raw material it can use but cannot change and therefore cannot understand. Hence, in his later writings, the atom remains just beyond the bounds of human power and knowledge. Even in some of his earlier writings, certain statements that appear to root transformation in the atom may not refer to the atom, as sometimes they are taken to mean. In "Deucalion, or Restoration," the "more common principles" that must be understood for the sake of renewal need not refer to the very principle of matter itself, the atom; just as easily, and more sensibly in light of Bacon's exposition of metaphysic, they could refer to the forms adhering in composite bodies, which are indeed principles more common although not ultimate (SEH VI.661-2, 737). Likewise, in "Proteus, or Matter," the "near annihilation" necessary to break the "several species according to their ordinary frame and structure," and thereby transmute matter, demands no more knowledge than how atoms behave in quantity, for such is the knowledge of forms (SEH VI.652, 726). Of course, the acquisition of such knowledge is still the great feat of natural science, according to Bacon. Yet it stops short of the knowledge how to make atoms take on new impulses.

Bacon doubts mankind's ability to manipulate atoms thoroughly and, by manipulating them thoroughly, understand them thoroughly. Forms can be understood better because they can be created and destroyed; atoms cannot be. But Bacon's doubts extend further than that, even in *De Sapientia Veterum*, because he also questions mankind's ability to isolate atoms. His theological convictions seem to play a role here. In his rendering of the Coelum myth, it is Jupiter or God who has taken all matter and forced it into the region of earth. Simultaneously with the resettlement of matter upon earth, where matter experiences decay and death, comes the concord wrought by Venus, who joins atoms into larger bodies, without which conjunction, decay and death would not occur. The combination of such cosmic events conveys a sense of irresolvable unity amongst them, as though while on earth atoms must always subsist in larger aggregates. To isolate them would be to return the earth to the reign of Saturn. Bacon interprets the myth so as to allow for the possibility of Saturn's

return. Saturn was left alive, he explains, in order to teach "that the world might yet relapse into its ancient confusion and intervals of no government." Yet Bacon implies that the dissolution of the world necessitates a second, seismic act by Jupiter, or God. This aspect of the myth reveals a pagan anticipation of a Christian truth circumscribing natural knowledge. The truth is that the world can be destroyed, its forms lost and all composites dissolved back into their constituent atoms, just as it was created—by divine will. But until final destruction, the enduring Saturn is nevertheless "thrust out and overthrown" by Jupiter, a usurpation equivalent to that of the elder Cupid by the younger Cupid (SEH VI.650, 724).

Metaphysic and natural magic deal with the world as disposed by Jupiter and activated by Venus, a world full of sympathies and antipathies; not with world ruled by Saturn, in which atoms drift in chaos. The sympathies and antipathies emerge and vary in strength and kind with the development of small arrangements of atoms. Naked atoms themselves are too uniform to develop them. Those sympathies and antipathies then determine forms, or the laws that are the proper objects of metaphysic and natural magic. They also determine latent schematisms and processes, the objects of the lower studies of physics and mechanics. Even when the prolongation of life rises to its highest level as an art—that is, when it seeks the boundary of a body's endurance through the schematisms and processes that hold the parts together in life—it still deals with arrangements of matter prone to corruption and "death." Because the laws governing the forces of life are grounded in "mortal" forms and schematisms, life must inevitably court death. In fact, Bacon seems to say, life cannot last without it.

CHAPTER 7

FRANCIS BACON AND THE MEANING OF "LIFE"

As I have said before, *The History of Life and Death* does not investigate exactly what its title indicates that it will. Its practical aim of prolonging life diverts its inquiry from all modes of life and death to one kind of death, natural death, or death by old age, which arrives at the end of the process of natural dissolution. It does not proceed in the painstaking and exhaustive manner of the ideal natural histories that Bacon imagines for the great instauration. If it did, it would include larger collections of facts and would forego the many untested prescriptions that Bacon suspects might help people live longer. A larger history, presumably, would incorporate more information about deaths by disease and violence and probably more about plants and other animals. As it stands, *The History of Life and Death* is eccentric to a history of art, comprising much that is untried by Bacon himself or anybody else, especially physicians. With its many self-proclaimed remedies, it flirts with the temptation of Atalanta's golden apples, Bacon's pejorative metaphor for the quick rewards of science that distract inquiry from its proper course. If *The History of Life and Death* hewed more closely to his model of natural history, it would help limn the Baconian Forms of life and death. When Bacon enumerates Forms, he includes life and death, *vita* and *mors*. Pointing beyond mechanics into metaphysic, *The History of Life and Death* would provide the raw material out of which a natural philosopher could rigorously define those phenomena.

That is not what *The History of Life and Death* provides. It does offer, in Bacon's own words, a "*Forma*" of death that pushes in the direction of the kind of Form exemplified in the *Novum Organum* by heat. That is, it starts to analyze death in terms of the motions of minute particles,

especially those of the vital spirits found in plants and animals.[1] But that *Forma* lacks even the rigor of Bacon's a definition of heat, which he admits to be insufficient. And the book does not offer a complementary *Forma* of life, however provisional.

Nevertheless, the book still must have some way of delimiting the two phenomena it purports to study even if, by necessity, it cannot have a final and perfect definition of those things from the start of its inquiry—a final and perfect definition being one that matches Bacon's rules of "truth of contemplation" and "freedom in operation." So, how is Bacon delimiting life and death?

The question is especially intriguing because it appears to yield two very different, almost contradictory answers, both supported by scholars. Each answer gives pride of place to life, upon which Bacon's definition of death implicitly relies. On the one hand, life is a principle of matter. This is a vitalist conception of Bacon's natural philosophy, one adopted by scholars who situate Bacon's ideas within a broader context of Renaissance naturalism. As evidence, in multiple passages Bacon describes appetites and motions native to all material bodies. On the other hand, matter is a principle of life. This is a mechanist conception of Bacon's natural philosophy, one endorsed most recently by Guido Giglioni, who has published one of the few studies of Bacon's theory of life.[2] As evidentiary support, he takes Bacon's professed intention to study life in terms of inanimate substance. He finds that in Bacon's cosmos life emerges with predatory traits of matter.

In my view, neither of these conceptions is correct. As I hope to show, Bacon begins to define life in a way that is more complex and probing than either misconstruction allows. Although I agree with Giglioni that Bacon's inquiry into life is distinctive among its early modern counterparts for its disavowal of vital substance and for its foundation in the universal operations of matter, Bacon's working definition of life verges on vitalism—but vitalism not in the mode described above.

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[1] This *Forma* of death relates to the extinction of vital spirits. In the last moments before death, Bacon says, vital spirits are extinguished either by constriction of motion, by overheating, or by loss of aliment. See OFB XII.328-337.

[2] Guido Giglioni, "The Hidden life of Matter: *Techniques for Prolonging Life in the Writings of Francis Bacon" in Francis* Bacon and the Refiguring of Early Modern Thought, ed. Julie Robin Solomon and Catherine Gimelli Martin (Burlington, VT: Ashgate, 2005), 129-144.

What I mean will take some explaining, and the explanation probably would do better to avoid the words "vitalist" and "vitalism" altogether. However, a consideration of those potentially confusing terms makes for a good starting-point. It will enable us to see what is wrong with the first interpretation that I gave above. Afterwards, I shall discuss Giglioni's argument, and then continue on to what I think Bacon actually proposes.

People who dub Bacon a "vitalist" or his natural philosophy "vitalism" suggest intentionally or inadvertently something about how Bacon perceived life. What that perception was varies depending upon what one means by "vitalism," but in every case there is a chance, a very good chance, that the label does more to explain away Bacon's thoughts about life than it does to explain them. Such is the case with a certain usage that reinforces paradoxically the very outlook it tries to transcend.

In the last decade or so, several literary scholars have sought to re-biologize early modern literature by restoring to it the unity that supposedly existed for early moderns between the human body and the outside world, and between the body and the mind. The effort to re-biologize is meant to counteract a preceding and potentially ongoing de-biologization enforced by scholars and readers under the spell of Cartesian dualism. For early moderns, an important component to their biological view of nature (as opposed to, presumably, a later mechanist view) was "vitalism." But vitalism here carries a peculiar meaning. A passage from Gail Kern Paster's book *Humoring the Body* elucidates the sense. According to her, Bacon falls under the rubric of early modern "vitalism," because he portrays an "animated universe" in which "the self traversed by desire finds its own contradictory longings mimicked everywhere by the sympathies and antipathies that organize and move a desiring universe filled with the strivings of appetite in all things animal, vegetable and mineral."[3]

If this brand of vitalism had a dictionary entry (and it does not, at least not in the OED), it might run as follows: *The doctrine or theory that life pervades all matter in the universe*. Brian

[3] Gail Kern Paster, *Humoring the Body: Emotions and the Shakespearean Stage* (Chicago: University of Chicago Press, 2004), 30-33. When first mentioning vitalism, Paster cites Owsei Temkin's *Galenism*.

Copenhaver has referred to this kind of vitalism as "cosmic vitalism," a name that evokes the fullness of life that it teaches.[4] In Paster's view, Bacon was a cosmic vitalist, subscribing to and promulgating a rather commonplace Renaissance notion—inherited from Neoplatonism, alchemy, natural magic, Paracelsus, and other sources—that all matter is living. She goes further, though, because she also assumes what constitutes animation and life. Her definition is something that perhaps not every version of cosmic vitalism would agree with. Life is in the primal appetites and motions of matter. All matter is living because all matter exhibits such motions; they inhere in matter in whatever form matter takes—animal, vegetable, or mineral.

Certainly, Bacon did posit that matter possesses innate motions. In fact, *Novum Organum* II.48 identifies and expounds nineteen of them. The *Silva Silvarum* and the natural histories elaborate the appetites and "motions" of matter, too, and their descriptions make matter sound alive. Material bodies "desire" things and "strive" after them or "fear" other things and "flee" them. As Paster notes, material bodies have sympathies and antipathies. They even exercise "perception," the ability to seize that which is amenable.[5] So if "vitalism" means something like the belief that bodies of matter possess inherent tendencies irreducible to efficient causes outside themselves, we would have to call Bacon a vitalist.

But do such tendencies represent life? When deployed by Paster, the words "vitalism" and "animate" imply that they do and impute to Bacon the same belief. But nowhere does Bacon claim that any native motion of matter, much less all native motions of matter, distinguish life pure and simple. Although he adamantly defends the doctrine that all material bodies must have motions, he does not say that such motions are "vital" or that they "animate" the bodies in which they occur. Some of his contemporaries might have; John Donne, for instance. But Bacon does not. Paster superimposes those beliefs.

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[4] Brian Copenhaver, "Astrology and Magic" in *The Cambridge History of Renaissance Philosophy*, ed. Charles B. Schmitt and Quentin Skinner (Cambridge: Cambridge University Press, 1988), 292.

[5] For Bacon's theory of perception, see SEH IV.402-404.

Her view of Bacon is skewed by a presupposition that Bacon fits neatly into the larger intellectual framework of his age. Thus the motions of matter that he describes must "enliven" the universe, as they would have for many of his contemporaries. But the problem reaches beyond historical induction. When we late moderns hear Bacon describe the tendencies of any material body to resist penetration, to preserve self-continuity, to revert to its original dimensions, or to multiply itself, we feel tempted to call such bodies "living" or "animate." The temptation is instructive and has historical precedents that may inform our reading of Bacon, but ultimately, I think, it arises from a dichotomy that is a little too simple and misleading.

Cosmic vitalism of the kind Paster identifies—the belief that all matter is living or animate because it exhibits native appetites—makes sense only when set over and against a belief that matter is merely extension. If merely extended, matter has size and shape but no other properties, such as attractions and repulsions, sympathies and antipathies, or desires and fears, which make it active. In this dichotomy, active matter is "living," and impotent matter is "dead." Classical mechanics promotes the view of matter as impotent extension, and its success over the last few centuries tends to reinforce the dichotomy. The premise that matter is mere extension is ultimately Cartesian as well.[6] Thus, when we today relegate mention of matter's inherent appetites and motions to vitalism, we very well may be approaching nature from a Cartesian perspective.[7]

The more immediate problem, however, is that the dichotomy between living matter and non-living matter leaves no room for Bacon. Anyone who adheres to this dichotomy cannot acknowledge that the same person might believe that matter possesses appetites but that those appetites do not necessarily represent life. But Bacon espouses this seemingly paradoxical view. According to him,

[6] Descartes, of course, famously dubs matter "essentially extension," but his thoughts on the original motions of matter are somewhat ambiguous. In *Principles of Philosophy* at least, he restricts motion to local motion, or "the transfer of one piece of matter, or of one body," the ultimate source of which is not explained. In *The Philosophical Writings of Descartes*, trans. John Cottingham, vol. 1 (Cambridge: Cambridge University Press, 1985), 233.

[7] Our slip into this mode of thinking is curious. Each element of the periodic table exhibits a distinctive level of attraction and repulsion to other elements, yet we do not call modern chemistry vitalist. We tend to reserve the term for older theories even if the criterion we use persists into later ones. Our inconsistency of usage calls into question the viability of the term "vitalism," at least when it denotes a belief in native appetites of matter. We do not always assume that belief in the innate appetites of matter constitutes vitalism or that matter as such is living.

matter is more than just extension. Matter has, if no other motion, the motion of resistance, by which it defies penetration of its own dimensions. Different bodies of matter exercise other motions to greater or lesser degrees, some motions for "conservation," others for "propagation."[8] Density gives to some bodies a strong tendency toward torpidity, which is, paradoxically, still a "motion" in Bacon's idiom. Propagating motions occur more readily in thin or rare bodies. Neither kind of motion, though, earns from him the tags "living" or "animate." Because mortual spirits reside in all tangible objects at or near the surface of the earth, they might seem like vital or animating forces; however, mortual spirits assimilate and multiply because they are thin, not because they are animate. They are especially brisk and prolific, like other pneumatics such as air and fire. But Bacon does not call them living—in fact, he does nearly the opposite. Instead, mortual spirits occur *within* both "living" [*vivis*] and "non-living" [*mortuis*] things (OFB XII.148-9).

Although the dichotomy I have been discussing is emboldened by classical mechanics, it stems from two opposing viewpoints about matter current in Bacon's day and before. When Galen was composing his medical treatises, he attested to two basic sects in medicine and natural philosophy: the atomist school represented by the Roman physician Asclepiades, who denied that parts of matter have "native powers" (*oikeias dunameis*), and the school following Hippocrates, who knew that they do.[9] The first school, according to Galen, attempted to explain the growth and nutrition of the body strictly by the forces exerted between corpuscles of matter. The corpuscles did not possess interior powers but moved in reaction to external factors; they were inalterable—merely extended bodies of variable shapes and structures. Hence, the Cartesian notion of matter as extension had its origins in classical atomism. Democritus held that matter accumulates through collisions of

[8] Bacon foreshadows the better-known critique of the Cartesians made by Leibniz. In a letter dated May 1702, Leibniz opposes the Cartesian idea of body as simple extension. First, he revises the definition of matter from extension to "diffusion of resistance," then adds that each body has, in addition to matter, the *dynamicon*. The *dynamicon* comprises two kinds of forces, passive and active, that roughly correspond to Bacon's two divisions of motions, conserving and propagating . See *Philosophical Essays*, trans. Roger Ariew and Daniel Garber (Indianapolis: Hackett publishing, 1989), 250-256.

[9] Galen, *On the Natural Faculties*, trans. Arthur John Brock (Cambridge, MA: Harvard University Press, 1916), 42-49.

atoms falling at variable speeds through void. In his account, atoms do not attract or repel each other through innate forces. They collide randomly and latch together simply because of their structures and shapes. The theory of Epicurus and Lucretius changed the path by which atoms traverse void and collide. They fall at even rates and connect by the anomalous and mysterious "swerve." Nonetheless, in this theory too, atoms are largely impotent. Whatever the source of the swerve, atoms hold together because of their shapes. They hook together; they do not attract each other.

The second school mentioned by Galen, which included himself, posited by contrast that small bodies of matter had a capacity for alteration. The alterability of all matter empowered faculties of attraction and repulsion by which one body joined with a similar body or spurned a dissimilar one. Most vehemently, Galen rejected the claim by Asclepiades and Epicurus that nature lacks faculties of "specific attraction." Specific attraction occurs through "appropriateness of quality" rather than through the more mechanical attraction induced by vacuum. A bellows draws in air by the latter; a magnet draws iron filings by the former.[10]

Here we find a basic dichotomy between matter as impotent and matter as empowered; however, Galen's dichotomy differs from that which additionally classifies the first kind of matter as dead and the second kind as living. He does not refer to the native powers of matter as signs of life. Later occultists did. So did "vitalist" interpreters of Galen during the twentieth century.[11] But in his own writings he does not define those properties of matter as marks of animation or life. They do indicate a conception of nature very strange to many late modern readers perhaps, one which interprets nature, in Galen's words, as an artificer or artist, ensuring that living things are born, change, grow, and reach fulfillment.[12] Nature as such resembles the world soul of Stoics and

[10] Ibid., 71.

[11] An example is Arthur John Brock, translator of the Loeb edition of Galen's *On the Natural Faculties*. In his introduction Brock is intrigued by Galen's espousal of a vitalist natural philosophy prescient of Henri Bergson's. There and in the subsequent text, he repeatedly refers to Galen as a vitalist and liberally deploys words such as "living" and "physical" when they do not correspond to Galen's own words.

[12] For nature as *technike*, see Galen, *Natural Faculties*, 43.

Neoplatonists that infuses all matter with life, but Galen draws the line between living and non-living things differently. "Nature" for him does not even include non-living matter.[13]

Well before Bacon, then, we see disagreement over whether or not motions inherent in all material bodies constitute "life" or "animation." The disagreement relies ultimately, I suspect, on Aristotle's definition of "nature" in Book II of *Physics*. Aristotle derives his famous definition dialectically. At first, nature designates everything around us not man-made, including seemingly static objects such as stones and dirt. But as he proceeds, he comes to settle on nature as "that which has the principle of motion inside itself." Properly, nature consists of living things, and life thus would seem to be the condition of retaining the principle of motion within oneself, an inference Aristotle confirms in *De Anima*. Of course, a problem arises if one believes that all matter retains principles of motion and change. Then all matter would seem to be living, and we would wind up with a fusion of Aristotle's first and final definitions of nature: everything around us is nature—even works of art—because everything around us is living. I think that the latter is the view that a host of Stoics, Neoplatonists, and natural magicians took, but we also must recognize that Galen, who affirmed the native powers of matter, nevertheless insisted upon a more familiar distinction between living and non-living things—as even Stoics, Neoplatonists, and natural magicians on occasion maintained.

The discrepancies between these different viewpoints give us good reason to doubt the assumption that for everyone in the Renaissance the native powers of matter necessarily signaled life. That assumption approaches the question exclusively from the perspective of Neoplatonism and natural magic, which was not always consistent anyway. It ignores a powerful line of thought stemming from Aristotle and Galen.

The label "vitalism" can insert the assumption that native powers signaled life. When applied to Bacon, it does. Thereby it obscures the subtlety of his thinking about the relationship between the

[13] To Galen's "nature" (*physis*) properly belong the effects of genesis, growth, and nutrition.

native powers of all material bodies and life. Bacon's thoughts are more ambivalent, resembling Galen's on two important counts. First, although "Cupid, or the Atom" and the manuscript *On Principles and Origins According to the Fables Of Cupid and Coelum* entertain classical atomism, particularly Democritus's version, Bacon rebuffs even Democritus's atom because it lacks properties sufficient to explain the varieties of lager bodies that we see in the world. Bacon believed that simple bodies of matter must consist of more than size, shape, and a single, uniform motion through space. They also must have native powe, in particular the power of attraction.[14] Furthermore, in *The History of Life and Death*, he insists that nutrition occurs not only because of the mechanical action of propulsion of nutriment out from the center of the body to the extremities but also because of the attraction between an outlying part and a nutriment of similar substance (OFB XII.306-7). The motions of simple bodies outlined in *Novum Organum* II.48 are crucial to the assimilation performed by the parts. Those motions, however, characterize non-living bodies of matter, too. About nutrition, Bacon's opinion aligns with Galen's against those of Asclepiades and Epicurus. It also runs counter to Descartes's account of nutrition, which ignores forces of attraction and, instead, explains nutrition as the passage of humors through fibers of different sizes and arrangements.[15]

Although Bacon was familiar with a dichotomy of thought about whether or not matter exhibits native powers, the name "vitalism" distorts one side of that dichotomy in a way that may not have been true to Bacon and, possibly, to many other Renaissance writers. Notably, the word "vitalism" did not appear in the English lexicon until 1822, according to the OED—well after its

[14] In "Cupid, or the Atom," Bacon accuses Democritus's theory of atomic motion of being "a narrow theory, and framed with reference to too few particulars." The true Cupid "acts at a distance," by which Bacon seems to mean that the atom must have a power of attraction, without which "no motion could be originated." Yet Cupid, or the atom, is also "naked." In *On Principles and Origins*, Bacon explains that the atom is naked because stripped of qualities known to the senses, such as the properties associated with the four elements, or properties such as heavy, light, hot, cold, dense, rare, hard, or soft. In this later text, though, Bacon also gives some credence to the hot-cold dualism of Parmenides and Telesio. But ultimately he thinks that dualism too is framed with reference to too few particulars. Perhaps Bacon was thinking his way to the idea expressed in the *Novum Organum* that all matter has motions of conservation and motions of propagation. In the *Novum Organum* Bacon also delivers some of his last opinions about atomism. See SEH VI.654-7, 729-31 and OFB VI.196-267.

[15] See Part Three of *Description of the Human Body* in *The Philosophical Writings of Descartes*, trans. John Cottingham, vol. 1 (Cambridge: Cambridge University Press, 1985), 319-321.

diacritical opposite, classical mechanics, had established its foothold. Bacon, along with his contemporaries and predecessors, did not use the word. Of course, not every anachronism is harmful. The term "vitalism" may help if it points to a real distinction among early modern philosophy that early modern philosophers themselves did not recognize and therefore did not bother to name but that we, retrospectively, do recognize and therefore must name. It can mislead us, however, if it surreptitiously inserts ideas about life where they do not belong.

And it can mislead us for another reason, too. Vitalism does not always refer to the cosmic vitalism that I have sketched, the belief that life pervades all matter. I can identify at least two other meanings, and unless scholars who deploy the word state clearly what it denotes, it can mislead readers who understand a different value.

The second definition of "vitalism" leads us to the Guido Giglioni's recent study of Bacon. This meaning I do not have to paraphrase on my own, because the OED actually uses this sense, and only this sense, to define the word. According to the OED, vitalism is "the doctrine or theory that the origin and phenomena of life are due to or produced by a vital principle, as distinct from a purely chemical or physical force." I believe that this is also the sense in which many historians of science use the word.[16] Notice that the editors of the OED define vitalism dialectically, by contrast to that which it is not. Vitalism is not a mechanistic theory of life. A mechanistic theory of life explains life's origins in the terms of a universal chemistry and physics, or in terms of efficient causes. Life emerges from small bodies or corpuscles of lifeless matter knocking into one another and undergoing new combinations or chemical reactions. The decisive point is that the living and the lifeless lie on a

[16] Finding instances of "vitalism" in scholarship about the early modern science, or about intellectual life more generally, is not hard, but deciphering what an author denotes by it can be. In *Heat and Life* (Cambridge, MA: Harvard University Press, 1964), Everett Mendelsohn seems to intend by it the notion that life is an inexplicable principle (100). While discussing Van Helmont, Richard Westfall uses "vitalism" and "Naturalism" to indicate, I think, a combination of the notions that everything in the universe is animate and that the origins of life cannot be explained, or the notion that the origins of anything cannot be explained. See his *The Construction of Modern Science* (Cambridge: Cambridge University Press, 1971), 28-30. More recently, William Newman discusses similar trouble with deciphering the term "mechanism." He identifies three basic notions often imported to "mechanism" by scholars: "denial of action at a distance," "structural reductionism," and "a rejection of final causes." These three are diametrically opposed to the three notions of vitalism that I outline here, but the correspondence is accidental. I did not read Newman's book until well after drafting this paper.

seamless continuum, with lifeless matter the principle of all else. Therefore life can be reduced to what is lifeless. In contrast, vitalism holds that life as a principle is irreducible. Life begins with life. There just is something living in the world, and we cannot explain it in terms of other things that do not live.

This second notion of vitalism is not the same as the first. In fact, they appear to contradict each other. The second supposes that a fundamental division exists between living and lifeless things; cosmic vitalism supposes that everything is in some way living, that no division exists.[17] Among early modern writers, the two concepts did not always coincide. For instance, the medical concept of primigenial moisture conceals a belief in the second; it presumes that some unique substance holds ultimate responsibility for life. Implicitly, the possession of radical moisture and innate heat distinguishes living from non-living things. In typically contrarian fashion, Paracelsus asserts that in spite of what some people might think all matter does possess the principle of life within it: strike a sword to flint, and in that spark is life; the thing most emblematically lifeless, a stone, contains it.[18]

In the Renaissance, the concepts behind these two notions of vitalism found instantiation in radical moisture (a vital substance peculiar to living things) and *pneuma* (a vital substance common to all things). Some early modern writers lean toward one, some toward the other, and some toward both at once.[19] Those who lean both directions at once combine Galenic theory with the doctrines of

[17] The belief that life pervades all matter may lead to the inverse of this second notion. Precisely because the principle of life is in everything, someone might surmise that life ceases to be a unique phenomenon irreducible to mechanistic terms. Descartes's natural philosophy is cosmic vitalism read in reverse: things pervade life. Like Paracelsus, he speaks of life as a kind of fire or heat, but, unlike Paracelsus, he finds the material nature of heat the grounds by which to distinguish life from mind and to investigate it in corporeal terms. Plants and animals share with human beings life but not mind. Thus, life must be a phenomenon of mechanics. In his *Treatise on Man* Descartes famously describes the human body as a mechanical fountain. He concludes with the following sentence: "In order to explain these functions, then, it is not necessary to conceive of this machine as having any vegetative or sensitive soul or other principle of movement and life, apart from its blood and its spirits, which are agitated by the heat of the fire burning continuously in its heart—a fire which has the same nature as all the fires that occur in inanimate bodies" (Descartes, *Philosophical Writings*, vol. 1, 108).

[18] *Hermetic and Alchemical Writings of Paracelsus*, vol. 2, ed. A.E. Waite (London: James Elliott, 1894; reprint, Whitefish, MT: Kessinger, 2002), 112.

[19] D.P. Walker observes an important distinction between medical and magical pneuma in *Spiritual and Demonic Magic* (London: The Warburg Institute, 1958), 4.

Neoplatonism and natural magic and often reconciled the opposed concepts with the assumption of a dualism of matter and form. Marsilio Ficino is such a case—a Neoplatonist, natural magician, and medical doctor rolled into one. According to Ficino, all "things" consist of matter, but no thing exists without form, the principle of life. But things come to "live" in an ordinary sense when the power of form overcomes the weight and dross of matter. Ficino supposed that cosmic *pneuma* invests all matter with life. *Pneuma* is a fiery breath inseparable from matter yet also is a real force. It promotes the coming-to-be and growth of all things, but as a principle of life it is unique. It can be harnessed, but not analyzed and investigated at the level of lifeless mechanics.[20] At the same time, the things more commonly recognized as living also possess radical moisture, which declines with age. It too is a principle of life, but one which not all material bodies share. Like *pneuma*, however, it has a mysterious origin and quality, passed from one generation to the next and, among moistures and nutriments, nonpareil.[21]

Bacon furnishes a good example of an early modern writer (one of the few) who rejects the concepts behind both kinds of vitalism. Although he posits that native powers exist in all material bodies, he does not equate those with life, and he explicitly rejects the notion of a world soul (SEH II.640-1). In addition, he seeks to understand life, in the words of Guido Giglioni, on the basis of "material properties" rather than through "the supposedly vital qualities irreducible to matter."[22] Bacon scoffs at radical moisture theory, because he rejects any explanation of aging that roots senescence in the loss of a substance that does not behave like anything else in nature. Instead, he wishes to investigate life as a function of material bodies, the structures and qualities of which are the same among inanimate substances.

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[20] Marsilio Ficino, *Three Books on Life*, trans. Carol Kaske and John Clark (Tempe: Medieval and Renaissance Texts and Studies, 1989), 254-7.

[21] Ibid., 168-75.

[22] Giglioni, 129-30. Giglioni does not use the term "vitalism" in his essay, which might be for the better; however, he describes Bacon's matter theory using the language of the second definition above.

To support Giglioni's point, one could add that, for Bacon, life is a Form. As such, it is reducible to the latent schematisms and processes as the other Forms are. The structures and motions of tiny material bodies define it. Therefore, Bacon's understanding of life is not vitalist, in the sense that he does not suppose life to be a principle. Rather, life relies upon other, more mechanical principles. It arises from that which is lifeless.

To the question whether Bacon was a vitalist we could come up with two contradictory answers that, at first, appear quite plausible. However, if we wish to follow the meaning of "life" through Bacon's own words, the answer that, yes, he was a cosmic vitalist suffers from a lack of support whereas the answer that, no, he was a mechanist opposed to the second notion of vitalism looks more defensible. Immediately, though, the second answer leads to other questions regarding how, as a mechanist, Bacon defined life and where on his scale of matter life first appears.[23]

It is the purpose of Giglioni's essay to try to answer such questions. His essay falters, however, on a series of confusions that arise from a want of attention to Bacon's own words—although his inference that Bacon sought to define life in terms of material properties is basically right. Disentangling these confusions can help us understand how Bacon was restricting the meaning of "life."

The first confusion is that with which we already have dealt while discussing cosmic vitalism. This is the confusion that comes with failing to use the words "life" and "living" with consistency, for those are the very things about which we seek to know Bacon's thoughts. Giglioni assumes what Bacon meant by "life" while, at the same time, he attempts to discover it. Not only does Giglioni fail to acknowledge that "life" is one of Bacon's forms and therefore from his vantage point not perfectly understood, Giglioni also attributes to Bacon claims that Bacon did not make. For instance, Giglioni

[23] If Bacon adhered to the first notion of vitalism but not the second, his position would have been odd in the Renaissance but not necessarily self-contradictory. For instance, life could be reduced to the mechanics of matter because all matter exhibits "living" properties of sympathy and antipathy. We should ask whether such a position is better dubbed "mechanistic" or "vitalist," however. Yes, it presumes that life can be explained by the properties of ordinary matter, but it also describes those properties as animate. Depending upon where we wish to put the emphasis, we could describe it either way, mechanist or vitalist.

writes, "Matter is alive, argued Bacon, because regulated, structured, and maintained by primal properties."[24] Although Bacon certainly claims that all matter has primal properties that regulate, structure, and maintain it, I do not see where he says that matter "is alive" because of those. This is the same mistake made by those who presumes that Bacon was a cosmic vitalist.[25] Giglioni presupposes that the primal appetites of matter make matter "vital" or living, but cannot point to evidence in Bacon's texts where he says they are. The confusion mounts as Giglioni goes on to claim that, according to Bacon, life "starts when a source of discomfort interrupts the self-identity of being."[26] Here his interpretation locates life in a particular motion of matter, assimilation or digestion, exhibited by only one kind of simple body, vital spirit, whereas before he located life in all the motions exhibited by all bodies. Whether Bacon thought life originated with vital spirit is a question we shall have to take up again, but the perplexity of terms—most coming from the interpreter rather than the author—does not help us answer it.

Another confusion stems from the first. When Bacon lists schematisms of matter in *De Augmentis*, he includes the pair "animate and inanimate" but not the pair "life and death" although the *Parasceve* lists the latter as a necessary object of study.[27] It is possible that Bacon may have considered life and animation different things. In other words, not every living thing may have a soul, according to Bacon. Giglioni, however, mingles terms, often using "animate" not in the classical sense of "ensouled" but in the much more recent and less metaphysical sense of "living." He says not only that according to Bacon "life starts when a source of discomfort interrupts the self-identity of being"[28] but also that "the permanence of inanimate life, and not the transience of animate

[24] Giglioni, 130.

[25] The premise of a cosmic vitalism akin to Paster's occurs in Giglioni's remark that Bacon's physics is "based on the idea of a living substratum endowed with natural appetites" (129).

[26] Ibid., 131.

[27] SEH I.560, IV.356

[28] Ibid., 131.

lives, is Bacon's most genuine meaning of life"[29] The latter thesis may contain provocative insight, and could even be right, but its relation to the previous thesis is hard to understand, because of the jumble of the words "life," "*demortua natura*" (Bacon's Latin for durable, non-living natures), "animate," and "inanimate." Whether Giglioni always equates "living" and "animate" is also hard to tell. Immediately preceding the first thesis quoted above—that "life" begins with the disruption of more permanent nature—Giglioni affirms, "If inanimate matter is the domain of the self-identical persistence of being, animate matter encapsulates all the factors that unsettle this paragon of indefinite duration"[30] The juxtaposition of this and the sentence preceding it suggests an equation between "life" and "animation," between "living' and "animate," between "life" and "soul." But elsewhere Giglioni seems to intend a distinction; for instance, in the statement above that the "permanence of inanimate life," and not "the transience of animate life," is Bacon's "most genuine meaning of life." The distinction between inanimate life and animate life implies that not all life is animate and that therefore a difference abides, according to Bacon, between life and soul. But it is hard to decipher what Giglioni means. If he still intends "animate" in the late modern sense of "living," then "inanimate life" makes no sense and "animate life" is redundant. We should try to understand what distinction, if any, Bacon draws between "living" and "animate" and acknowledge that, for him, *animatus* may very well carry the metaphysical sense of ensouled.

Thirdly, Giglioni tangles permanence and life. Bacon uses two adjectives that may suggest permanence and have even been translated as such: *fixa*, or "fixed," and *durabilis*, or "durable." Fixed or durable bodies such as stones and minerals last a long time and persist in one of the two ways in which bodies endure, *in Identitate simplici*, or "in simple identity." They do not undergo repair, which is the other way bodies endure. If I understand Giglioni correctly, his main argument is that Bacon's pursuit of the prolongation of life is paradoxical, because it issues from a paradoxical

[29] Ibid., 141.

[30] Ibid., 140.

conception of life, which presumes life to be produced by non-living matter. According to Giglioni, in Bacon's natural philosophy, "death is life, and life is death": the relative permanence of non-living matter is truly life, or at least a "shadow of immortality," whereas the transience of "animate beings (living spirits)" is truly death.[31] This paradox strikes me as more precious than instructive. It elides the distinction upon which Bacon grounded his entire investigation into life and death, the distinction between the human body as an "inanimate thing" and as an "animate thing." "Animate things" are not fixed but undergo repair. Bacon's attempts to prolong life are not attempts to endow animate things with the simple identity of inanimate matter, like his example of an insect preserved in amber. His attempts treat of human beings as complex organisms subject to repair. It always recognizes them as ensouled or "animate" creatures. Giglioni's own muddle of "animate" and "living" renders the impression that Bacon did not recognize soul, which is not true, and his paradox renders the impression that Bacon cared more about the inanimate side of his inquiry than about the animate, which is also not true. While we observe a possible distinction between "animate" and "living," we also must recognize that Bacon offers us the first clue as to what he took to be the critical distinction between animate and inanimate things, namely, the ability of repair by alimentation. "Living," though, still may not mean the same thing as "animate."

In spite of these flaws, Giglioni's essay presents the intriguing assertion that life begins with vital sprits. Because the assertion might seem plausible to anyone reading Bacon's natural histories, it warrants consideration.

Giglioni locates life in vital spirits because they are the smallest and simplest bodies that undergo repair: "Life, in Bacon's cosmos, starts when a source of discomfort interrupts the self-identity of being. It takes on the aspect of a predatory entity. Unlike inanimate spirits, vital spirits prey upon the substance of the body in which they happen to reside"[32] At this moment Giglioni

[31] Giglioni, 142. This marks another instance of Giglioni's equation of "animate" and "living."

[32] Giglioni, 131.

equates "animate" and "living." According to Bacon, animate things undergo repair, and vital spirits prey upon the bodies of plants and animals. If mortual spirits (or, as Giglioni calls them, "inanimate spirits") do not prey upon bodies they inhabit, then life would seem to begin with the power of metabolism or predation. To the *spiritus* that resides only in plants and animals, Bacon affixes the adjectives "*vitalis*" and "*vivus*." With those adjectives, he designates vital spirit a living entity. Life is the power of predation exhibited by vital spirit and filling all bodies that we commonly call living or animate.

There are a few problems with this line of reasoning. First, Giglioni's claim that mortual spirits do not prey upon the substance of the body in which they reside is patently false. As Bacon repeatedly declares, mortual spirits consume moistures and convert them into more spirits. Consequently, they play a key role in desiccation, the inanimate process involved in the natural dissolution of animate bodies. Thus it cannot be said that vital spirit marks the first eruption of "discomfort" in the cosmos. Other pneumatics prey upon and consume material bodies. In addition to mortual spirits, air and fire are noteworthy predators, air especially, which also contributes to the desiccation of animate bodies.

Secondly, if vital spirits are themselves living and the source of life in larger bodies containing them, as I believe Giglioni presumes, his interpretation undermines his thesis that Bacon, unlike so many of his contemporaries and predecessors, tries to understand life without "vital qualities irreducible to matter." Under Giglioni's analysis, vital spirits become another vital substance like primigenial moisture; their presence mysteriously infuses life, because they themselves embody life. Vital spirits animate larger bodies by filling them up with the substance of life.

The third problem, and the root of the previous two, is that Giglioni assumes that "*vitalis*" and "*vivus*" indicate that vital spirits are themselves living. We do not have to make that assumption. In fact, Bacon points us in another direction. Whenever he differentiates the two kinds of spirits, he starts with where they reside. Mortual spirits dwell in all tangible objects at or near the surface of the earth; they inhabits inanimate as well as animate bodies. Vital spirits dwell only in animate things.

Bacon may very well have used the adjectives "*vitalis*" and "*vivus*" to signify not what the spirits are but where they are found.

In light of the evidence, that is the more plausible interpretation, but its consequences are more coherent as well. If *vivus* and *vitalis* signify location rather than a quality of being, we do not have to believe that, for Bacon, life begins with the predation by vital spirit when in fact he asserted that other pneumatics also prey upon the bodies they occupy. We also do not have to believe that, for him, life is explained simply by the presence of vital spirit. Life may be something else, and it may be something more complex, emerging from the mechanical operations of lifeless matter. In fact, if *vivus* and *vitalis* signify as I have suggested, "living" may denote the same thing as "animate," and life may begin, as animation does, with the ability to repair. If vital spirits are so named because of where they reside, Bacon would seem to equate "living" with "animate."

In the Preface to *The History of Life and Death*, Bacon employs the adjectives *vivus*, *mortuus*, *animatus*, and *inanimatus* in ways that can help us discern how he is dividing living from non-living. The words *vivus* and *mortuus* occur when Bacon explains parenthetically that the *Spiritus innatus* (the same as the mortual spirit) resides in all tangible bodies [*omnibus Tangibilibus*] whether those tangible bodies are living or non-living. The parentheses appear in Bacon's justification of his larger point that the first part of his inquiry, which concerns consumption, "has a great deal in common with what happens in inanimate bodies" [*Corporibus Inanimatis*]: "For what the innate spirit (present alike in all tangible bodies living and non-living), together with the ambient air, does to inanimate things, it also tries to do to animate ones, though here the superadded vital spirit partly tempers and blocks its operations, and partly intensifies them no end" (OFB XII.148-9). The innate or mortual spirit dwells in all tangible objects whether living or non-living. *Spiritus vitalis*, however, dwells in *animata* (animate things) but not in *inanimata* (inanimate things). Here, the word *vivus* or *vitalis* begins to align with *animatus*.

Let us look to see what Bacon denotes by the last word above, *animatus*. A few pages later, Bacon includes as examples of inanimate things or "durable natures" metals and stones (OFB

XII.15407) but draws the line between inanimate things and animate things with plants (OFB XII.150-1). Plants are animate; metals and stones are not. We might suspect that Bacon is following the main philosophical tradition here and invoking the notion of a vegetative soul, or *anima*, but we should recall the passage in *De Augmentis* where he replaces the lower souls as conventionally understood (vegetable and animal) with vital spirit: in brutes, the "sensible soul" is "the principal soul, the body of the brute being its instrument; whereas in man it is itself only the instrument of the rational soul, and may be more fitly termed not soul, but spirit" (SEH IV.398). Instead of denoting things possessing soul or *anima*, as convention and even etymology would suggest, the substantive *animata* denotes things possessing vital spirits. Vital spirits replace *anima* although, perhaps for the sake of convenience, Bacon retains the conventional designations *inanimata* and *animata*. Animate things contain vital spirits whereas inanimate things do not.

Bacon elides "living" and "animate," after all. His elision does not erase the questions whether and how the study of "life and death" may differ from "animate and inanimate," however. We shall have to return to those questions later.

Animate things also can repair themselves, as Bacon states when he divides his inquiry into prolonging life into inanimate and animate tracks: "Therefore the inquiry should be twofold: first considering the human body as something inanimate and unnourished; and second as animate and nourished" (OFB XII.148-9). Those tracks relate to the two ways that things persist in the world, in simple identity or by repair, respectively. The inanimate track investigates the human body as a thing that endures in simple identity; the animate track investigates it as a thing that endures through repair (OFB XII.150-1). If "living" indicates the same thing as "animate," Bacon would seem to define life by the process of repair, which in animate or living things has something to do with vital spirits. The trouble is that in Bacon's cosmos many bodies that he does not dub "living" or "animate" also experience repair. For example, vital spirits repair themselves, and mortual spirits do as well (OFB

XII.354-7) Furthermore, "repair" signifies much the same thing as "*assimilatio*," or "assimilation."[33] And, according to Bacon, all bodies to one degree or another possess the power of assimilation. He includes assimilation among the nineteen motions that he lists in the *Novum Organum*. Other pneumatics, which are certainly not living or animate, such as air and fire, assimilate adeptly.[34]

In the *Novum Organum* II.48, Bacon defines assimilation as a motion whereby "homogeneous bodies convert bodies that are related, or at least well-disposed and prepared, into their own substance and nature." As he explains in *The History of Life and Death*, "all bodies" [*Corpora omnia*] have a desire for assimilating [*Assimilandi*]. The strength of the desire, however, varies with the density of the body: "Thin and pneumatic bodies, like flame, spirit, and air, do that lavishly and eagerly; on the other hand, ones whose mass is gross and tangible do so extremely weakly, because their desire to assimilate is curbed by the stronger desire for rest and immobility" (OFB XII.314-7). The power of assimilation increases with rarity of structure. Dense solids exhibit the faint kind of assimilation called accretion, whereby, say, clay wedged between stones becomes more stony, but thinner bodies exhibit the more robust assimilation commonly called nutrition (NO II.48).

If all bodies that we know persist by repair or in simple identity, the place of pneumatics such as vital and mortual spirits, air, and flame is unclear. Though they assimilate, they are not animate things, such as plants and animals. Perhaps Bacon suggests that the ability to assimilate makes them animate. That might seem likely until we hear Bacon call fire and air inanimate substances (NO II.48). Although he insists that endurance in simple identity belongs to inanimate bodies "alone" [*tantum*], he does not insist that repair belongs to animate bodies alone (OFB XII.150-1). In other

[33] Although I cannot find a passage in which Bacon distinguishes repair and assimilation, we may be able to infer a distinction. Repair suggests the replacement of what has been lost through the transference of part of one body into another, otherwise called consumption. Assimilation also includes the self-multiplication of bodies beyond parts lost. As *The History of Life and Death* makes plain, repair happens through assimilation. In Bacon's usage, assimilation is both an action and a native power of material bodies, but repair, only an action. The appetite to assimilate bears responsibility for repair.

[34] See below.

words, all animate things persist through repair, but not everything that persists through repair is animate.

Nonetheless, repair connects animate bodies to inanimate bodies and places the living on a continuum with the lifeless. Against the background of Aristotelian and Scholastic natural philosophy, Bacon's analysis of assimilation is striking. Aristotle promulgated, and many philosophers following him endorsed, the doctrine that life or animation begins with metabolism, a motion of change from one state to another that yet preserves what underlies the change. According Aristotle and Aquinas, the vegetative soul, which has as its principal function nutrition, is the lowest soul. It infuses all living things, but it alone of all three souls directs the lives of plants. Plants assimilate nutrients but have no feeling, motion, or reason. In contrast, Bacon teaches that assimilation characterizes many inanimate things as well, and thus it does not serve to distinguish the animate from the inanimate, the lifeless from the living. Echoing a traditional adage, Bacon often reminds readers that vital spirit is like a fire. The Preface to *The History of Life and Death* extends the simile to life; life is a like a fire, and could be preserved eternally like a vestal flame if properly supplied. But in a manner also found in occult philosophy, his analysis turns the analogy around, to show that assimilation is not special to so-called living or animate things. Flame, which is thinner than vital spirit, assimilates so rapidly and completely that nothing underlying it remains. It is thoroughly evanescent, extinguishing and reforming itself every moment it persists on earth. Air, which is denser than vital spirit, is by contrast a fixed thing which nonetheless assimilates copiously, too. As a substance, vital spirit lies between the two, neither evanescent as flame nor as durable as air (OFB XII.376-7).

Bacon appears not to bound life to repair alone, because inanimate things also repair themselves; however, repair is still important to his definition of life. We just need to see how he qualifies repair such that it begins to make sense as a distinction between animate and inanimate things. He offers a more ready and agreeable criterion for life, but to see it we need to pull back to his cosmology. Bacon's cosmos is stratified, and the truly durable natures occupy homogeneous

regions where opposite kinds cannot destroy them. Gross bodies deep in the earth, Bacon speculates, are virtually permanent because they are removed from pneumatics. Pneumatics in the upper regions of the heavens are virtually permanent because removed from gross bodies. Thinking in such terms, we can perceive that the durable natures familiar to us (stones, metals) are not exactly permanent; they are not even as long-lasting as the gross bodies deep in the earth's crust, which Bacon affirms eventually perish. On the surface of the earth, durable natures persist in simple identity but still are subjected to consumption by air and spirits. We also can perceive that pneumatics are actually durable if correctly situated. Only near the surface of the earth do they suffer destruction. Air destroys mortual spirits. Vital spirits expire under the duress imposed on them by gross bodies. The division between things enduring in simple identity and things enduring by repair takes us to the two poles of the cosmos, to fixed bodies under the earth's crust and to the celestial fire always nourished by the ether.

Seen from this broader perspective, repair hardly seems distinctive, as I already have said. Nearly all pneumatics perform it. They survive through nourishment, not in simple identity. The remarkable kind of repair occurs in the middle region of the cosmos. Only here do gross bodies that ordinarily remain fixed in identity enact repair. Life occurs in the middle region of the cosmos when the two kinds of material bodies, pneumatic and gross, which typically consume or oppress one another, cooperate in a strange way, the gross bodies providing aliment to the consuming vital spirits and those vital spirits supplying heat that enables the gross bodies to repair themselves against consumption. Such a definition has the advantage of avoiding arbitrariness; it gives life legitimate distinction. It even echoes the common delimitation of life at metabolism—but of course with an important addition. For Bacon, life is distinct because in living things assimilation happens where one does not expect to find it, in gross substances.

A few passages from Bacon's works confirm the definition of life that I have just given. In the *Novum Organum* II.48, Bacon lists among the kinds of bodies that abundantly assimilate, not only pneumatics such as flame, air, and mortual and vital spirits, but also "the grosser parts of plants and

animals." He returns to the assimilation enacted by the grosser parts of plants and animals in the eighth operation of *The History of Life and Death*. After stating that rare bodies assimilate more actively than dense ones, Bacon adds this very strange sentence: "It is also certain that the desire to assimilate, which is, as I have said, curbed, and made ineffective in a corporeal mass, is somewhat freed, stimulated, and eventually actuated by heat or spirit near by—which is the only reason why inanimate bodies do not assimilate whereas animate ones do" (OFB XII.316-7). This sentence sounds strange because the sentence immediately prior to it (not to mention the previous discussion of assimilation in the *Novum Organum* II.48) avows that in fact inanimate bodies do assimilate. It sounds strange until we realize that the last part of the sentence still refers to the "corporeal mass" [*Mole corporea*] in animate bodies. The gross substances in animate bodies assimilate whereas similar substances when found in inanimate bodies do not. Though marked by the assimilation performed by gross bodies, life is catalyzed by vital spirits and their heat. On their own, vital spirits vigorously assimilate because they are thin. But they are especially fiery, too. In the bodies of animals and plants, their heat enables the gross, dense substances to overcome their torpor and assimilate aliment. When properly robust, their heat penetrates gross parts enough to stir them but not so much as to consume them. Life is a communion between the vital spirits and gross substances, and it begins with the act of freedom that is digestion. A desire in gross bodies is literally, according to Bacon, liberated [*liberari*] by spirit and heat.[35] But higher functions of the soul—locomotion, perceptions—also evolve from that communion. Vital spirits, Bacon says, activate the functions of grosser parts specially structured for those functions (OFB XII.352-3).

For Bacon, the innate motions of matter do not constitute life, nor do the vital spirits, nor does the power of assimilation. Instead, life is a process occurring between gross and pneumatic

[35] The twentieth-century philosopher Hans Jonas also speaks of metabolism in terms of freedom. For him, though, metabolism distinguishes life from matter. In the evolution of life, the defining moment between the lifeless and the living comes when matter begins to metabolize and thereby creates a new order of being that risks permanence for the sake of freedom. Like Bacon, Jonas discerns two orders of being tantamount to endurance in simple identity and by repair, but, unlike Bacon, he does not recognize assimilation as an appetite and process theoretically underwriting all matter. See *The Phenomenon of Life* (New York: Harper and Row, 1966; reprint, Evanston, IL: Northwestern University Press, 2001), especially his beautiful essay "Is God a Mathematician?: The Meaning of Metabolism," 64-98.

bodies unusually conjoined. It begins with the awakening of powers normally dormant in gross substance, first the power of assimilation. It is sustained by the continued apposition of vital spirits, which remain complacently inside gross matter so long as they preserve their continuity and are supplied with aliment. The juices of gross parts supply them with aliment. Thus, to effect life, vital spirits and gross parts join in a communion in which the durability of either is surrendered to the volatility of both.

Although this picture of life preserves a mystery that I shall discuss in a moment, I wish to emphasize that there is still something very mechanistic about it and that it is certainly more mechanistic than it would be if vital spirit itself were a living thing. Here, vital spirit does not vivify with its mere presence, as though life expands outward from the principle of life, but rather, it vivifies by bestowing heat. Something about vital spirit (its rarity, its fire-like substance, or both) enables it to generate heat. Its heat kindles motions latent in gross parts. Stirred by vital spirit, the gross parts then respond by repairing themselves—or performing other functions traditionally associated with soul.

Death comes when vital spirit is oppressed, overheated, or starved by the grosser parts with which it communes. Without vital spirit, the grosser parts cannot perform the function indicative of life—nutrition, sense, movement. A body devoid of those is dead. Death is another, more ordinary boundary that Bacon sets upon life. Death is not life, and life is not death. Death is the utter breakdown of the process continually occurring between vital spirit and gross parts.

I noted earlier that Bacon discriminates between the Forms coupled as "life and death" and those coupled as "animate and inanimate." Later, I asserted that for Bacon the words "living" and "animate" seem to denote the same thing. We should consider why, if they meant the same thing, he separates the pairs. The answer is in the other side of each pair. "Death" of course suggests something that "inanimate" does not; dead things once had life but lost it whereas inanimate things may never have had life. When Bacon pairs "life" with "death" in the *Parasceve*, he suggests that we must understand life in terms of death, and vice versa. In Bacon's practical mode of inquiry,

knowledge of life rises with knowledge of how to maintain life against death. *The History of Life and Death* aims to preserve life against the death that results from the slow onslaught of natural dissolution.

If life is understood in relation to death, animate is to be understood in relation to inanimate. Inquiry into life proceeds by preserving life from death, not, curiously, by creating life. Creating life opposes the living to the lifeless, not to the dead. Possibly with the coupling of the terms "animate and inanimate," Bacon is suggesting that inquiry into animation will proceed by the creation of life out of lifeless matter. Although "living" indicates the same as "animate," Bacon argues that to build our knowledge of life we must understand it against both death and lifelessness. Understanding what life is equates to how life works, which entails practical measures to gain control of life against both death and inanimate matter. The definition of life as not death also reminds us that, for Bacon, the phenomenon of life is not perfectly understood. The boundaries that he sets around life when he begins his inquiry guide the inquiry but do not decide it. Deeper knowledge of what life means will come with experiments to preserve and create life that potentially could upset his own theories.

Although Bacon sought to examine life in material terms—without supposition of a vital principle—his definition of life as a peculiar arrangement of vital spirit and gross parts evokes a third notion of vitalism. Seen in the works of late modern philosophers such as Henri Bergson but rooted in an Aristotelian concept, this notion differs from the previous two in that it distinguishes the life form from lifeless matter at the completion of the life form rather than at its origin. The point is not to figure out whether even the smallest particles of living and lifeless matter abide by the same laws but, rather, to comprehend the phenomenon of a living thing in its wholeness. A dictionary entry for this meaning of "vitalism" might run: *The doctrine or theory that life is a unity mysteriously preceding its material components*. Here, vitalism concerns entelechy, the Aristotelian notion that interprets all living things as complex wholes transcending the sum of their parts.[36]

[36] Recently, Aristotle's notion of entelechy has been rethought by commentators. According to Joe Sachs, when it came to entelechy and the associated notion of final cause, Scholastic interpreters mostly got Aristotle wrong. Their mistakes had

Bacon possibly espoused the concept behind this version of vitalism. According to what he suggests about life, life is neither of its components—the vital spirit or the various gross parts—but emerges from the combination of the two. At the very least entelechy poses a paradox for Bacon. On the one hand, he seeks to understand the operations of the human body through the latent processes and schematisms of smaller material components from which he expunges the power of entelechy. His disavowal filters down from the world-soul to the level of vital and mortual spirits. Whereas traditionally cosmic *pneuma*, or *spiritus* was the force of entelechy in the cosmos striving to bring all matter to its proper completion of form, when Bacon speaks about *spiritus* in *The History of Life and Death*, he insists specifically that it is not "an entelechy" or any other "silly trifle" [*Nugae*]; it is just a "body thin, and invisible, yet something real with place, and extension" (OFB XII.346-9).[37] Spirits, whether mortual or vital, behave thoughtlessly—but predictably because of their structure and rarity. More famously, he disparages Aristotelian final cause, a notion very much tangled up with entelechy. As Bacon observes, that eyelashes were made for the sake of the eye does not help us understand how eyelashes work. His assessment goes to the heart of entelechy, impugning the notion that the work of the part is directed by the whole.[38]

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profound repercussions for subsequent philosophers. What Aristotle was really arguing, Sachs demonstrates, is not that beings *have* final causes but that they *are* final causes. Each is an organization of parts all functioning together for the sake of the whole. See his *Aristotle's Physics: A Guided Study* (New Brunswick: University of Rutgers Press, 1995), 24-5. In the Renaissance, the alternative interpretation often gave rise to the notion of enchained purposes: plants and animals live for the sake of humans, and humans for the sake of God. Such an extrapolation widens the compass of entelechy and final cause beyond Aristotle's original bounds.

[37] Although early modern writers disseminated the concepts behind all three notions of vitalism, the concept behind this last one may look very different in its early modern and late modern instantiations. Many early modern writers tended to expand entelechy out to all the cosmos whereas late modern philosophers such as Bergson and Jonas largely delimit entelechy to the individual life form. For many early moderns, entelechy was a function of the world soul or cosmic *pneuma* because the cosmos itself was thought to be a living being, an animal with its soul or spirit infiltrating every part and bringing each part to its completion. Thus the individual plant, animal, or human was a unity constituting a part of a larger unity. Furthermore, often the concept here tended to fuse with the concept behind cosmic vitalism. The example of Marsilio Ficino serves. Another apt one is Giordano Bruno's dialogue *Cause, Principle, and Unity*. The didact in the conversation, Teofilo, professes that the "universal intellect" within the world soul fills every corpuscle of matter and "directs nature to produce her various species suitably" (37). By contrast, more recent exponents of entelechy have tended to demote the role of cosmic harmony in its discharge; even Bergson, who positions his philosophy against not only "mechanism" but also "radical finalism." See Bergon's *Creative Evolution*, trans. Arthur Mitchell (Mineola, NY: Dover Publications), 50.

[38] The finality (*telos*) inherent in the word *entelechesia* came under fire before Bacon. In *De Anima*, Philip Melanchthon challenges the common interpretation of *entelecheia* given by the schools. He contends that instead of the neologism *entelecheia*, Aristotle really wrote the neologism *endelecheia*, a word derived from the adjective *endeles* and therefore denoting continual motion or activity, without the additional sense of coming to an end. According to Melanchthon,

On the other hand, Bacon's purpose to prolong the lives of human beings treats of life as a process that completes a whole different from any of its material parts. He wishes to preserve the human body as a living thing, not as an inanimate object like an insect trapped in amber, and at the very least that means preserving the human body as thing that can repair itself. The function of repair begs the question, repair of what? Bacon's answer is not each isolated part but the whole.

Another way of stating the paradox confronting Bacon's analysis is that while it doubts the ability of speech to identify form according to nature's own operations, it is limited by the form of life recognized in speech. While trying to analyze life materially, Bacon lends credence to the Aristotelian hylomorphism that he so adamantly opposed. Ostensibly, Bacon aligns with the Greek materialist Antiphon, whom Aristotle roundly denounces in II.1 of *Physics*, where he builds his case for hylomorphism. According to Aristotle, Antiphon maintained that being consisted of only material, not material and form together, and that all subsequent forms acquired through change are merely different dispositions of underlying matter. Bacon holds a similar view although he jettisons the traditional conception of four elements and replaces them with multiple small bodies with various structures and motions. In his paradigm, Forms arise from the dispositions and motions of matter that are hidden from immediate perception and therefore not easily conducive to *eidei*. Forms are not, as Aristotle says, the natures of things as recognized in speech.

But the matter stands differently when Bacon examines life. Because life has its roots in a complex interaction between material bodies, in a process that gives rise to a third immaterial something that is different from either material cooperating to produce it, Bacon has trouble keeping the discussion focused on the material mechanisms inducing life. To deal with the uniqueness of life, he seeks recourse to the forms of things as recognized in speech. An example occurs in the Preface to *The History of Life and Death*, in a passage that shapes the rest of the inquiry. Bacon performs some logical sleight-of-hand when he justifies his claim that the vital spirit contributes to consumption, the

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endelecheia actually means the same as *energeia*, and a scribe's mistake—an interposition of tau for delta—mislead philosophy for centuries. See *Corpus Reformatorum*, vol. 13, ed. Carl Bretschneider (Halle-Braunschweig: C.A. Schwetschke, 1846), Cols. 12-16.

process of natural dissolution in inanimate things: "For it is perfectly obvious that many inanimate bodies can last for a very long time without repair; but animate ones without aliment and repair rapidly break down and die out just like fire" (OFB XII.148-9). As Bacon explains, animate things are consumed faster than inanimate because of the addition of vital spirit. As evidence, an animal body actually loses weight faster when living but unnourished than when dead (OFB XII.334-5). But consumption of inanimate things and the consumption of animate things are also quite different. While being consumed, inanimate bodies gradually lose pieces of themselves to air, spirits, or other predators. If continued, the consumption may utterly destroy them, so that a substance we might have recognized previously, say, bone, no longer is recognizable as such but has dissolved into earth. Bacon's comparison disguises the difference between that kind of consumption and the consumption of animate things although, at the same time, his original Latin helps to reveal it. Animate things "break down" [*concidunt*] and "die" [*extinguuntur*]. Although when unnourished animate bodies lose weight, they also dissolve and die in a sense in which inanimate ones do not. They do not have to lose matter before we cease to recognize them as animate things. They just have to lose an activity or process. With the loss of that, they lose the form of life as recognized in speech.

Even for Bacon, the form of life lies close to speech because it denominates a whole irreducible to parts. Bacon can gesture toward reducing life to the independent processes of smaller components, but it is difficult to comprehend life without what Aristotle originally meant by entelechy: the whole is prior to the parts, and parts function in the service of the whole. The form of life as recognized in speech assumes the point. The brand of repair that Bacon finds operative in animate things does, too. Repair of a plant or animal occurs through the restitution of individual parts (spirits and various gross substances), but it results in the preservation of a third thing, life, that is the focus of Bacon's efforts. His analysis of life into its material components cannot explain why or how those components come together to produce life, or why the greater durability of individual parts is sacrificed for a volatile whole.

Those are mysteries that Bacon preferred remain mysterious. His famous dismissal of Aristotelian final cause would seem to knock him from the ranks of vitalists. We must be careful, however. Bacon does not wish to scrub final cause altogether. He wishes to expunge final cause from the realm of physic, the branch of natural philosophy between natural history and metaphysic. Final cause is "misplaced," not omitted (AOL II.vii.7). Misplaced into physic, it distracts inquiry into "impertinent" discourse and arrests it there. As long as it is kept to metaphysic, however, no "enmity or repugnancy" exists between, for instance, the statement that "the hairs about the eyelids are for the safeguard of the sight" and the statement "pilosity is incident to orifices of moisture." Both are "true and compatible" because the first relates an "intention," the second, "a consequence only." Confined to metaphysic, final cause becomes strangely "true." Its truth is strange because we cannot learn its truth, Bacon argues, by an induction that tests the "consequence" rendered in statements of physical causes. We arrive at its truth by other means, seemingly by an intuition of unity. In the previous paragraph Bacon avows that "all things…ascend to unity." Pagans like Plato and Parmenides merely supposed unity by "speculation" whereas, now, Christians know it through revelation. But here the unity is the guarantee of abstractions derived from "all things." The unity of life, of one concrete thing, is found neither by speculation nor by revelation nor even by true induction. It is found through a more immediate perception. Bacon implicitly endorses entelechy, but in a way that divorces the knowledge of the whole from the knowledge of the parts. The unity of life circumscribes natural philosophy but cannot be brought under its command. It guides the natural philosopher but cannot fit the rule of his instrument.

PART III

INTRODUCTION

Part Three examines some of the ways early moderns addressed the question whether one should prolong life. Here, the sense of the prolongation of life usually intended is not prolongevity. Among early moderns, the presumption of the impossibility of extending life far beyond its normal maximum tended to override considerations whether one should try to do so and became a domineering justification why one should not. Exceptions to this rule were, besides Francis Bacon, alchemists and natural magicians. For most others, including theologians, physicians, and poets, the more relevant and express quandaries concerned longevity within normal confines.

In particular were two interlinked questions. One was whether more time on earth is a good. On the one hand, many early moderns express a desire for longevity—if not for themselves then for others whom they love or flatter. The desire for long life, it was sometimes claimed, reproduced the natural inclination of self-preservation, and book dedications wishing their patrons long life are numerous. On the other hand, longevity certainly does not guarantee, and may even undermine, moral rectitude, nobility of soul, and holiness, all of which seem to surpass longevity in worth. Early modern philosophers, preachers, and poets often warn against the enticements of long life.

The second question revolved around longevity inclusive of the body's natural process of decay. Although what early moderns considered "long-lived" does not admit of an exact tabulation or perfect consistency, it commonly indicates an intrusion into old age when the body's powers have declined and perhaps even senile afflictions have set in. In other words, the second question was whether old age understood as an embodied process is a good. If old age necessitates misery and pain, as sometimes early modern writers maintain, it may seem an evil; however, if it is marked

instead by a withdrawal from bodily pleasures and commotions, as they also speak, it may seem a good.

Part Three comprises three chapters and begins with the focus of my dissertation, Francis Bacon. I have decided to use his apologetics as entrée into the moral and religious dimensions of prolonging life as early modern writers limned them, because, first, he directly confronts some arguments about longevity and, second, he treats these objections as though they apply equally to his extraordinary, prolongevist plans.

Chapter 8 deals with the apologies that Bacon expressly makes in *The History of Life and Death* and *De Augmentis*. Collating these, I have distilled his arguments to three. The most interesting, I think, re-assesses the classical *summum bonum* in order to open the way for the project of enhancing human nature. Almost exclusively, his three arguments reflect upon the first question above, longevity sans old age. How Bacon could conceive of a long life without the debilities commonly associated with senescence should be obvious from Part Two. With the completion of the great instauration, Bacon hopes to put aside the second question, whether natural dissolution is a good; his apologies assume its answer, which is "No."

The next two chapters, 9 and 10, should define Bacon's defense of longevity a little better by tracing alternative stances to it. These two chapters are alike in that they present early modern responses that one way or another implicitly disagree with Bacon's and assume, unlike Bacon, that senescence is an inevitable characteristic of longevity.

Complicating matters, Chapter 9 concentrates more attention on the idea of longevity as a function of embodied process. If longevity must entail maturity and senescence, as early moderns of course typically believed, longevity contains more than just the quantity of life to recommend or censure it. In early modern literature, a common narrative depicts old age as a focus of miseries, but another common narrative depicts healthy old age as a reward for sound living and as a time of life especially suited to wisdom. Chapter 9 shows how these competing narratives confuse the ascertainment of moral and spiritual progress. It does this primarily through analysis of Spenser's

Fowre Hymnes and *The Faerie Queene*, Book I. As I argue, the *Fowre Hymnes* depicts the decidedly Christian struggle of sanctification and derives much of its rhetorical power from the tension inherent in that struggle between what J.A. Burrow has dubbed transcendent and natural ideals of human perfection. In *The Faerie Queene*, Redcrosse Knight's encounter with Contemplation dramatizes a similar tension. Although this chapter lays a groundwork for Chapter 10, it addresses more prominently the limitations wrought by the human body and its ineluctable processes. In particular, the maturity and decline of the body raise problems about *tempestivas*, or seasonableness, of moral action and piety: for instance, how much our spiritual development depends or is predicated upon our physical and how much results from our own efforts.

Chapter 10 continues a discussion begun in Chapter 9 about the *summum bonum*, the highest good, which it advances via a selection of Ben Jonson's dramatic works and his Cary-Morison Ode. A preliminary analysis of the masque "Mercury Vindicated from the Alchemists at Court" and his plays *Volpone* and *The Alchemist* leads to a comparison between Jonson's conception of nature and Bacon's, but it also provides wider perspective on Bacon's indictment of the desire for long life voiced in the Cary-Morison Ode. In the larger section of this chapter I interpret Jonson's ode as a response to classical, and especially Stoic, attitudes toward longevity and the highest good. In philosophy, the Stoic tradition offers the most resolute opposition to the idea of longevity as a choice-worthy good. Like the Stoic Seneca, the model of his thought, Jonson extols moral perfection, but, unlike Seneca, his exaltation of "greatness" and "good" does not convert longevity into a matter of indifference however much it might diminish it. As I try to show, Jonson's ode exhibits some problematic assumptions inherent to the Stoic ideal, but it also attempts to rectify other problems wrought when that ideal is brought forward into a Christian context. In particular, Jonson revises the Stoic polemics that he inherits to fit them within his more sociable and Christian vision of a world in which friendship is paramount and endurance an article of faith. Additionally, though, the ode evinces anxiety about senescence—about Jonson's own senescence—and I conclude the chapter with a discussion of Jonson's attempt to use the ode as his elixir.

CHAPTER 8

FRANCIS BACON'S JUSTIFICATIONS FOR PROLONGING LIFE

(1)

> Although I placed the *History of Life and Death* last on the list of the six monthly histories that I planned, I have decided to bring it forward and publish it in second place on account of the exceptional utility of the matter, a matter in which the slightest loss of time should be counted precious. For I hope and wish that it works for the good of many, and that the more outstanding physician lift up their minds somewhat, and not immerse themselves in mercenary cures, nor acquire honor only out of necessity, but become servants of God's omnipotence and mercy in prolonging and renewing the life of man, especially as this is achieved by ways that are safe, convenient, and civil, though untried. For although we Christians ever aspire and thirst after the Promised Land, yet in the meantime it will be a mark of Divine Favor if, in our pilgrimage in this world's wastes, these our shoes and clothes (our frail bodies) be as little worn out as possible.
>
> Salutation, *The History of Life and Death* (OFB XII.143)[1]

(2)

> Ancient is the refrain and complaint that life is short and art long. So it seems right that I, who devotes his utmost strength to perfecting the arts, should also, by the grace of the Author of Truth and Life, apply my mind to the prolongation of human life. For though this mortal life is nothing other than an accumulation of sin upon sin, and affliction upon affliction, and though they who long after eternity set little store by this life, even so keeping works of charity going should not be held in contempt by us Christians. Besides, the beloved disciple outlived the others, and many of the Fathers, especially the holy monks and hermits, were long-lived; so that this blessing (repeated so often in the Old Law) seems to have been removed after our Savior's time less than other earthly blessings. Now it is easy to take this as the greatest good, but an inquiry to come up with means of achieving it is hard, the more so because it has been corrupted by false opinion and groundless reasons. For what the medical rabble generally says about the radical moisture and natural heat is deceitful, while the

[1] Cum Historiam Vitae & Mortis, inter Sex Designationes Menstruas, ultimo loco posuerimus; omnino hoc praevertere visum est, & secundam edere, propter eximiam rei utilitatem; in qua, vel minima temporis iactura, pro pretiosa haberi debet. Speramus enim, & cupimus futurum, ut id plurimorum bono fiat; atque ut Medici Nobiliores animos nonnihil erigant, neque toti sint in Curarum sordibus; neque solum propter Necessitatem honorentur, sed fiant demum Omnipotentiae, & Clementiae divinae administri, in vita Hominum proroganda, & instauranda; praesertim cum hoc agatur, per vias tutas, & commodas, & civiles, licet intentatas. Etsi enim nos Christiani, ad Terram Promissionis perpetuo asperimus, & anhelemus; tamen interim itinerantibus nobis, in hac Mundi Eremo, etiam Calceos istos, & tegimina (Corporis scilicet nostril fragilis) quam minimum atteri, erit signum Favoris Divini.

extravagant praise heaped on chemical medicines only raises men's hopes to dash them.

Preface, *The History of Life and Death* (OFB XII.145)[2]

(3)

But the lengthening of the thread of life itself, and the postponement for a time of that death which gradually steals on by natural dissolution and the decay of age, is a subject which no physician has handled in proportion to its dignity. And let not men make a scruple of it, as if this were a thing belonging to fate and divine Providence which I am the first to bring within the office and function of art. For Providence no doubt directs all kinds of death alike, whether from violence or disease or the decay of age; yet it does not on that account exclude the use of preventions and remedies. But art and human industry do not command nature and destiny; they only serve and minister to them.

De Augmentis IV.2 (SEH IV.383)[3]

* * *

The three quotations above represent Francis Bacon's most overt attempts to justify on moral and religious grounds the ultimate practical goal of his great instauration, the prolongation of life. Other passages from his works impinge on his justification, but the passages above, being the most straightforward, make good starting-points for analysis.[4] Though straightforward, none is very long. Bacon never spends much time defending the choice-worthiness of prolonging life. His reticence, as I hope shall become clear in this chapter, signals his deep and preceding conviction of longevity's

[2] De Vita brevi, & Arte longa, vetus est Cantilena, & querela. Videtur igitur esse tanquam ex congruo, ut nos qui pro viribus incumbimus, ad Artes perficiendas, etiam de Vita Hominum producenda, cogitationem suscipiamus, favente & Veritatis, & Vitae Authore. Etsi etiam Vita Mortalium, non aliud sit, quam Cumulus, & accessio Peccatorum, & Aerumnarum, quique ad Aeternitatem aspirant, iis leve sit lucrum vitae; tamen non despicienda est, etiam nobis Christianis, Operum Charitatis Continuatio. Quinetiam Discipulus Amatus caeteris superstes fuit; & complures ex Patribus, praesertim Monachis sanctis, & Eremitis, longaevi fuerint; ut isti Benedictioni (toties in Lege veteri repetitae), minus detractum videatur post aevum Servatoris, quam reliquis Benedictionibus terrenis. Verum ut hoc pro maximo Bono habeatur, proclive est. De Modis assequendi, ardua Inquisitio; eoque magis, quod sit & Opinionibus falsis, & Praeconiis vanis depravata.

[3] Atqui filum ipsum vitae producer, ac mortem per resolutionem simplicem et atrophiam senilem sensim obrepentem ad tempus summovere, argumentum est quod nemo ex medicis pro dignitate tractavit. Neque vero subeat animos hominum ille scrupulous, ac si haec res fato et Divinae Providentiae commissa in artis officium et munus iam primum a nobis revocaretur. Providentia enim proculdubio mortes quascunque, sive ex violentia sive ex morbis sive ex decuru aetatis, pariter regit; neque tamen ideo praeventiones et remedia excludit. Ars autem et industria humana naturae et fato non imperant, sed subministrant. (SEH I.590-1).

[4] Other passages relevant to Bacon's apologetics include several chapters in *De Sapientia Veterum* ("Prometheus," "Orpheus," "Memnon," and "Tithonus"), *The Advancement of Learning* II.7.6 plus similar passages in *Valerius Terminus* (SEH III.227) and *De Augmentis* (III.4), his essays "Of Youth and Age" and "Of Death," and *Novum Organum* I.92.

worth and of his preference for doing the business of scientific discovery over carrying on debates about whether or not that business should even begin.

Of the passages above, the first is the Salutation to *The History of Life and Death* minus the heading, "*Viventibus et Posteris Salutem*." The sentences after the first are later repeated almost word-for-word in *De Augmentis*, Book IV, Chapter 2, when Bacon dilates upon the third office of medicine. The second passage is the first paragraph of the Preface to *The History of Life and Death* and does not recur in *De Augmentis*. The last passage comes from *De Augmentis* IV.2 but appears earlier than the alternate of passage 1; it occurs at the end of Bacon's introduction to medicine, just after he has pronounced that medicine should contain three branches, not two.

I believe that across the passages above we find three arguments for prolonging life.[5] These differ from the moral and religious arguments that many other early moderns deploy about long life, because Bacon takes seriously the prospect of perdurance without senescence. We must keep in mind that when Bacon defends longevity he intends an unusually youthful variety.

Below, I trace the three arguments that cut across the above passages. I have arranged their demonstration so that certain relationships between them will emerge. These relationships are that the first argument, charity, relies upon proof that long life is a good, something provided, in part, by the second argument, divine favor. Above all, however, I am interested in Bacon's third argument, which is that the prolongation of life constitutes the "greatest good." The third supplies another anchor to the first. This anchor derives from natural reason rather than faith, but as I shall argue, it is the principle of the rest.

As we shall see, what Bacon means by the "greatest good" is not what one might first think. In his estimation, it is not the highest object of choice although its peculiar designation, the

[5] Among Bacon's other works, I find two other possible justifications for the prolongation of life, both more allusive and speculative than those here. One is longevity's potential benefit to the construction of knowledge; the other is its potential benefit to social and professional organization and activity. Several of the passages mentioned in the previous note hint at these justifications. A full study of Bacon's defense of prolonging life would account for them. I do not attempt a full study here. However, I am working on an essay about the connection Bacon draws between long life and epistemology, in particular his insistence that the "uniting of notions and conceptions of sciences" remedies the "complaint" of the Hippocratic aphorism *vita brevis, ars longa*.

prolongation of life, is the ultimate practical objective of Baconian science. Primarily, what I want to demonstrate is that Bacon is not a proleptic avatar of modern, technological democracies who subordinates public virtues and service to the continued well-being of individuals. Rather, his evaluation of the good of longer life reveals a complex engagement with classical ethics resulting in an ethical "platform" that ensconces influences from three classical traditions—Peripatetic, Stoic, and Epicurean—yet ultimately is different from any of the three. In this platform, the prolongation of life is a good of greatest necessity but lowest worth. As revealed by his commentary "Prometheus," however, a crucial difference separates classical attitudes toward longevity and Bacon's. Bacon has a revolutionary understanding of the goodness of nature as a thing discovered rather than given. Unlike most classical philosophers, Bacon believes that the goodness of prolonging life exceeds the supposedly natural span of life.

Charity. In passage 2, taken from the Preface of *The History of Life and Death* but roughly duplicated in *De Augmentis*, Bacon appeals first to *caritas*. To prolong life is to keep the works of charity going. Although the word "*caritas*" does not appear in passage 1, charity informs it, too. Service in the name of God's omnipotence and mercy amounts to charity. Thus, the first argument that Bacon stresses to readers of his *History* is that physicians should rally to the prolongation of life for the sake of charity.

This means two different things. In passage 1, physicians perform charity by increasing the lifespans of their patients. In passage 2, their gift of longer life enables those receiving it to do charitable works for more time. By presuming that longer life is good, both passages meet a serious objection; namely, that the bestowal of longevity is not a good and, if not a good, not charity. As Bacon admits, the gift of a longer stay on earth does not look like kindness if it means remaining mired in "the world's wastes" [*Mundi Eremo*] and delaying one's entrance into heaven: "though this mortal life is nothing other than an accumulation of sin upon sin, and affliction upon affliction, and though they who long after eternity set little store by this life…"

The depiction of the world as "waste" and as a worthless morass of sin and affliction can be found in the writings of John Calvin. Calvin argues that the mind cannot seriously contemplate and aspire to the next world "until it has learned to despise the present life."[6] A withering view of the present life is necessary, "for there is no medium between the two things: the earth must either be worthless in our estimation, or keep us enslaved by an intemperate love of it."[7] Among His chosen people, Calvin says, God attempts to depress the natural love of the present life and to restore a proper sense of the vanity of all worldly goods "by a constant proof of [life's] miseries." Through "diseases and dangers" God reveals "how unstable and evanescent are all the advantages competent to mortals." In the "contest" of life such afflictions assist the godly on the way to heaven:

> We duly profit by the discipline of the cross, when we learn that this life, estimated in itself, is restless, troubled, in numberless ways wretched, and plainly in no respect happy; that what are estimated its blessings are uncertain, fleeting, vain, and vitiated by a great admixture of evil.[8]

Afflictions help to free a faithful soul from the intemperate love of earthly life, and "in proportion as this improper love diminishes, our desires of a better life should increase."[9] Calvin exhorts believers "in forming an estimate of this mortal life, and perceiving that in itself it is nothing but misery, [to] make it their aim to exert themselves with greater alacrity, and less hindrance, in aspiring to the future and eternal life."[10] As measured by contempt of the present life, the desire for the next reaches its heights in "the most accurate" but nonetheless falsely established opinion of the ancient Greeks "who thought that the best thing was not to be born, the next best to die early." Disdain for the present life comes with an ardent longing for death.[11]

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[6]John Calvin, *Institutes of the Christian Religion*, trans. Henry Beveridge (Grand Rapids, MI: William B. Eerdmans, 1989), III.9.1.

[7] III.9.2.

[8] Ibid., III.9.1

[9] Ibid., III.9.4.

[10] Ibid.

[11] Ibid.

Not surprisingly, Bacon anticipates some faction of his early modern readers to share Calvin's outlook. He poses two answers to this Calvinist objection. One is the idea that a long life demonstrates divine favor. We hear this response in both passages 1 and 2. This is his second argument, however, so I shall discuss it in the next section. The other answer, heard in the clause from passage 2 that "keeping works of charity going should not be held in contempt by us Christians," is that the performance of holy works vindicates the continuance of earthly life. Although not clearly a good in other regards, long life undoubtedly allows more time for charity. What kind of spiritual benefit charity provides Bacon does not say. As a natural history addressed principally to physicians and written in Latin, *The History of Life and Death* seeks an audience larger than that of England, and the main clause of this sentence is written with accommodating touches, referring to readers broadly as "Christians," putting the clause in the understated negative ("should not be despised"), and declining to specify what contribution charity makes to a Christian's life. To many Catholic readers, the argument of charity may intend that longer life permits greater opportunity in which to do works contributing to one's salvation. To many reformist readers, however, including Calvinists who may object that the present life is to be despised, it may indicate an extension to regeneration or holiness.

Regeneration, according to Calvin, follows upon faith as a benefit when "sanctified by his Spirit, we aspire to integrity and purity of life" (III.11.37). Marked by repentance, it includes "love towards men" among its "fruits." Charity along with "offices of piety toward God" and "general holiness and purity of life" serves only as a sign of justification but informs regeneration.[12] Regeneration is a long and constant process that cannot culminate on earth:

> This renewal, indeed, is not accomplished in a moment, a day, or a year; but by uninterrupted, sometimes even by slow, progress God abolishes the remains of carnal corruption in his temples, restoring all their inclinations to real purity, so that during their whole lives they may practice repentance, and know that death is the only termination to this warfare.[13]

[12] Ibid., III.3.16.

[13] Ibid., III.3.9.

A longer life allows more time for this progress although for the whole of regeneration, repentance and its rewards, not for charity alone. Bacon singles out charity, perhaps because, when understood as love towards one's fellow men, it already orbits closer to this life than the other two theological virtues do, certainly closer than hope, which manifests the desire for heaven. With focus on charity, Bacon obscures hope, but one must wonder whether the pious, either Catholic or reformed, would crave to perform charity so much that they would postpone the ultimate object of hope.

The emphasis on charity aligns Bacon's apology with two other discursive traditions. In passage 1, Bacon insists that physicians by prolonging life do the work of charity. As I tried to show in the Introduction, learned physicians of the Renaissance generally affirm medicine's ability to prolong life, provided that the kind of lifespan assumed is what Laurent Jourbert calls "natural" as opposed to "supernatural." Their position makes practical sense. Defending their art, they square off against detractors who claim that in the remedy and prevention of disease medicine does no better, or does positively worse, than nature left to itself. As part of their defense, Renaissance physicians often characterize their art as a divine office, using Ecclesiasticus 38:1-2 as authority: "Honor a physician with the honor due unto him for the uses which ye may have of him: for the Lord hath created him. For of the most High cometh healing, and he shall receive honor of the king."[14] Above all, Christ healed diseases as part of his charitable missions while on earth. As Erasmus, a lay defender of medicine's ability to prolong life, says in *Encomium Medicinae*, "What of this, as the most convincing commendation of all: that the same Christ, when still unknown to the world, gradually worked his way into the minds and hearts of men, not by gold, not by authority, but by healing the sick?"[15]

The learned physicians whom Bacon addresses probably would not contest his claim that the prolongation of life is charity. The claim smacks of convention. The resemblance to convention lies

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[14] King James Version.

[15] Translation is from *Collected Works of Erasmus*, vol. 29, ed. Harry Vredeveld (Toronto: U of Toronto Press, 1974), 45.

on the surface, though. Bacon restricts the prolongation of life to the alleviation of age's decay. He promotes the achievement of "supernatural" lifespans that Joubert sets outside the bounds of possibility for art. In *De Augmentis*, his more precise definition is obvious from the moment he introduces the third branch of medicine. In *The History of Life and Death*, however, it initially remains obscure. In the Salutation, two details offer clues, the word "renewing" [*instauranda*] and the statement that physicians combat mere necessity; however, a candid discussion of natural dissolution does not begin till later in the Preface.

The bolder sense of the prolongation of life marks the other tradition whose apologetic strategies Bacon adapts. Commending charity, Bacon also rehearses an appeal found among the kinds of chemists mentioned at the end of passage 2. Medieval and Renaissance alchemists often defend the pursuit of the philosopher's stone as a work of charity. When finally produced, "the medicine" will enable the chemist to bestow riches upon the poor and health to the sick. Ben Jonson parodies such claims in *The Alchemist* when Subtle laments,

> …I should be sorry
> To see my labors, now even at perfection,
> Got by long watching and large patience,
> Not prosper where my love and zeal hath placed them.
> Which (heaven I call to witness, with your self,
> To whom I have pour'd my thoughts) in all my ends,
> Have look'd no way, but unto public good,
> To pious uses, and dear charity
> Now grown a prodigy with men… (II.3.10-18)

Rather than a selfish and unchristian striving for the perpetuity of lust and money, the *magisterium* will benefit others. But the deferral of benefits to other persons merely transposes the dilemma, for not all persons want the stone for altruistic purposes. Thus, alchemists frequently disguise their teachings in cryptic language meant to deter the wicked. As the English alchemist Thomas Norton (c.1433-c.1513) writes in his *Ordinall*:

> For this *Science* must ever secret be,
> The Cause whereof is this as ye may see;
> If one evil man had hereof all his will
> All Christian Pease he might hastily spill,
> And with his Pride he might pull down

Rightful *Kings* and *Princes* of renown:
Wherefore the sentence of peril and jeopardy,
Upon the *Teacher* resteth dreadfully. (Chap. 1)[16]

Though not quite so secretive or perhaps so ambitious, Marsilio Ficino also expresses a concern in *De Vita* that longevity serve charity: "Nor do I wish [these instructions] to be divulged to people who are dissolute through their corrupt passion for pleasures, fools who far prefer the brief pleasure that lasts only a day' nor disclosed to the wicked and unjust whose life is the death of good men; but only to prudent and temperate people of sophisticated intelligence who will benefit mankind, whether in the private or the public sphere."[17]

Again, Bacon's justification for the prolongation of life as charity would have sounded like a matter of course to those who shared his prolongevist objective. Like alchemists, Bacon insists in passage 1 that *The History of Life and Death* work "for the good of many." But unlike alchemists, he does not screen his instructions behind secret codes, thus reserving them exclusively for the initiated few. His cooperative and demonstrative methodology of science demands wider involvement and communication.

Divine Favor. Passages 1 and 2 both move from an assertion that the prolongation of life is charity to an explanation why longevity is a good. The prolongation of life cannot legitimately be an act of charity unless longevity is a good, and under the belief that human life is a welter of sin and grief, the possibility of duration's goodness withers. In response to the religious conviction that the infinite bliss of heaven reduces the attractions of life to misery, Bacon offers another religiously inflected argument, which is that longevity signals divine favor. His first case—that it is a sign of divine favor "if in our pilgrimage in this world's wastes, these our shoes and clothes (our frail bodies) be as little worn out as possible" (passage 1)—lacks a stated scriptural ground but may be another

[16] Elias Ashmole, *Theatrum Chemicum Britannicum* (London, 1652), 14.

[17] Marsilio Ficino, *Three Books on Life*, trans. Carol V. Kaske and John R. Clark (Tempe: Medieval and Renaissance Texts and Studies, 1989), 510-1.

appeal to Calvinists. In the midst of accusing the present life as "nothing but misery," Calvin also warns against cultivating too powerful a disdain: "Still the contempt which believers should train themselves to feel for the present life, must not beget hatred of it or ingratitude toward God. This life, though in all kinds of wretchedness, is justly classed among divine blessings which are not to be despised."[18] The "divine benevolence" behind life accrues especially to believers, whose salvation life promotes. For one, life offers believers signs: "Before openly exhibiting the inheritance of eternal glory, God is pleased to manifest himself to us as a Father by minor proofs—viz. the blessings he daily bestows upon us." Some of these blessings come through nature, according to Calvin, and nature instructs us to thank God for giving us life and "all the means necessary for its preservation." Other, even greater blessings include the daily "warfare" ordained to believers before they triumph in heaven and "the foretaste of divine benignity" offered by the occasional delights of this world.[19] With the present life understood as both blessing and misery, the proper attitude for the faithful becomes, according to Calvin, to "leave the period of our life and death" to God's disposal yet "despise life" and "long to renounce it" until death arrives.

Bacon's image of our pristine "clothes" attempts to justify youthful longevity perhaps as a "minor proof" or daily blessing, or perhaps as a sign of victory in spiritual warfare. As to the latter, it may distinguish a life of holiness, purity, and regeneration if it means that we preserve the healthiness of body through a strict temperance. In addition, the image plays upon the durable metaphor of life as pilgrimage, which Calvin and other reformists fervently adapted to their own ends.[20]

The second case Bacon makes has clear scriptural grounds: "Besides, the beloved disciple outlived the others, and many of the Fathers, especially the holy monks and hermits, were long-lived; so that this blessing (repeated so often in the Old Law) seems to have been removed after our Savior's

[18] *Institutes*, III.9.3.

[19] Ibid.

[20] Calvin uses this metaphor himself at III.10. The most famous example, of course, is John Bunyan's *Pilgrim's Progress*, which succeeds Bacon. The historian Thomas R. Cole discusses the handling of the metaphor by early modern Calvinists in *The Journey of Life* (Cambridge: Cambridge UP, 1992), esp. 32-47.

time less than other earthly blessings" (passage 2). The "beloved disciple" refers to John the Evangelist, commonly given the epithet "*amatus*"; later in *The History of Life and Death*, Bacon cites the "beloved" John as having lived 93 years.[21] In this same natural history of long-livers, he also names three of the "monks and hermits" mentioned here: St. Paul the Hermit, who lived 113 years; St. Antony, who died at age 105; and St. Athanasius, who lived over eighty years (OFB XII.210-1).

In the Preface, Bacon employs such instances to demonstrate a curious point, not that the God-given "earthly blessing" [*benedictio*] of longevity has remained unchanged since the days recounted by the Old Testament, but that it has been diminished less since the time of Christ than other Old Testament blessings have been. Bacon alludes to the undeniable fact that "in the Old Law" God rewards the pious with the gift of long life and longevity ranks as a good. As he says, examples are prolific. The fifth commandment reads, "Honor thy father and thy mother: that thy days may be long upon the land which the LORD thy God giveth thee."[22] In Proverbs 3:1-2 Solomon enjoins, "My son, forget not my law; but let thine heart keep my commandments: For length of days, and long life, and peace, shall they add to thee." At the end of Job's travails, God blesses him with 140 more years of life, so he dies "being old and full of days."[23]

Such examples would seem to clinch the case that long life is a good as determined by God if not for the Augustinian belief that, in fulfilling the Old Law, the New Law replaces earthly and material blessings with spiritual. With the examples of the beloved St. John and holy monks and hermits, Bacon hopes to demonstrate that after the time of Christ long life has continued to be a blessing although he concedes that the blessing has dwindled. His concession probably implicates the patriarchs of Genesis. If so, however, Bacon's later rebuttal of the theory of nature's decay reinterprets passage 2. Since the day of Moses, longevity has not only remained a blessing, it has not tapered, either.

[21] The use of the epithet may trace back to John 21:20.

[22] Exodus 20: 12.

[23] Job 42:17.

Passage 3 offers an additional safeguard to Bacon's argument. Passage 3, it must be remembered, appears in *De Augmentis* IV.2, not in either the Salutation or the Preface of *The History of Life and Death*. There, it precedes by a few pages the slightly altered version of passage 1 in which Bacon affirms more confidently that longer life is "a gift to men—of earthly gifts perhaps the greatest—of which, next to God, [physicians] may become the dispensers and administrators" (SEH I.598, IV.390). In *De Augmentis*, Bacon cares less about convincing readers that after the time of Christ longevity has remained a divine blessing; he skips the point altogether. Instead, he seeks to defend his project from the charge that it intrudes upon divine providence or the will of God, a point that, conversely, he does not raise in *The History of Life and Death*: "And let not men make a scruple of it, as if this were a thing belonging to fate and divine Providence which I am the first to bring within the office and function of art." From trying to prove longevity's worth through its bestowal by God, Bacon switches to denying that the prolongation of life transgresses upon God's will. At bottom, Bacon confronts a possible objection that the human lifespan as a law of nature represents an invincible mandate of God.

His responses to this expected objection are two. One is directed at persons who might raise it: "For Providence no doubt directs all kinds of death alike, whether from violence or disease or the decay of age; yet it does not on that account exclude the use of preventions and remedies." Perhaps Bacon expects readers to supply the apt Biblical verse, such as Ecclesiasticus 38:1-2, which testifies to God's approbation of the healing arts. But Bacon's remark works another way, too. Appealing to the good sense of readers, Bacon points out a potential hypocrisy among would-be calumniators who, although they concede that God appoints every time of death, nonetheless seek out cures for their diseases and injuries or already try to delay the onset of old age by ordinary hygiene. Bacon argues that if one does not scruple the administration of cures for wounds inflicted by violence or for periodic illnesses, one should not do so when he, Bacon, proposes that physicians ply their art to age directly.

This first response blurs the human lifespan and the individual lifespan, making it difficult to tell what kind of divine providence Bacon intends. In the terms of contemporary religious discourse, a universal providence creating and sustaining the works of creation would underlie the period of human life generally, but the period of each individual life would be the object of special providence, what Calvin defines as the power by which God upholds and superintends "all the things which he has made, to the very minutest, even to a sparrow."[24] Calvin, of course, wishes to collapse all providence into special and spurns the idea that God infused nature with its laws and then let it go. The latter idea, however, resembles an argument commonly used to dismiss efforts to extend individual lives beyond the human boundary; although art can influence the length of each person's life, it cannot conquer the natural limit set to the human race by God. Bacon sounds a little like Calvin, eliding the special providence overseeing individual lives with the providence that has established the laws of nature. The elision obscures a difference important to physicians and natural philosophers, but it also suggests that preventions and remedies hold sway over the entire range of nature. These are only two potential problems with Bacon's first response. Additionally, an observation about how people react in the face of death does not confirm the sanctity of their reactions.

The second response is found at large in Bacon's works and represents his main innovation upon divine providence. More often, Bacon acknowledges providence at the foundation of nature, or universal providence; however, he locates the foundation of nature in an uncommon place. According to Bacon, the invincible laws of nature, which providence has established, lurk in the most subtle operations and structures of matter, not in nature's familiar courses or, to use Aristotelian terms, in substantial forms. Thus, only art can perceive them. In the case of lifespans, this means that conventional measures do not reflect providence; instead, the maximum lifespan that art can achieve reflects providence. In passage 3, Bacon concludes, "But art and human industry do not command nature and destiny [*fato*]; they only serve and minister to them." Implicitly, the sentence aligns nature

[24] *Institutes*, I.16.1.

with divine providence by substituting the pair "*Divina Providentia*" and "*fatum*" of two sentences before with the pair "*natura*" and "*fatum*"; however, it is not as humble as it first seems. It echoes Bacon's famous paradox that "Nature is only overcome by obeying her." The paradox turns on the difference between nature in its familiar appearances, which one can command, and nature in its hidden absolutes, which one must obey. In the latter sense, art cannot work outside nature or, consequently, outside providence.

This second response, though, undermines the notion that longevity is a special blessing. If God can bestow the gift of longevity as a special blessing, how can the art of prolonging life not conflict with providence? Yet if providence operates strictly at the ontological basis of nature, how can God bestow longevity as a special blessing? In general, Bacon's defense of the prolongation of life as an art is squeezed by his apology that long life is a divine benediction. If the lifespan is controlled by God, of what use is the art? As we have seen, Laurent Joubert struggles to overcome a similar protest in *Popular Errors*.[25] But unlike Joubert, who distinguishes between three kinds of fate and then reconciles conflicting opinions accordingly, Bacon refrains from dissecting the matter further and leaves his readers with the impression that whomever physicians successfully minister must already have been graced with long life by God. Bacon finally forces a different question than Joubert. His is not whether men can handle the instrument of God's will, nature, better than God Himself can, and thereby defeat divine purpose, but whether the will of God operates through nature at all. At the start of *The History of Life and Death*, Bacon implies that it does. Whatever physicians can do to lengthen and renew life, means are permissible so long as they are "safe, suitable, and civil" [*tutas, & commodas, & civiles*]. If techniques result in a renewed body and longer life, it is clear after the fact that God has marked the patient with His favor. Before that, apparently, physicians should not worry about whether they countermand providence when they change the course of nature.

As *The History of Life and Death* proceeds, however, the connection between nature and the will of God becomes more tenuous, as it already is in the passage from *De Augmentis*. After the

[25] See the Introduction.

Preface, the notion of divine favor all but disappears from the text. The numerous long-livers catalogued include the pious and impious alike, and Bacon's instructions rarely pertain to holy living or devotion. In fact, as examples and directives mount, a contrary impression builds, that longevity has almost nothing to do with divine blessing and much to do with human know-how.

The Greatest Good. Inadvertently or not, Bacon has raised the question whether the goodness of longevity is known by faith or by nature. Although the argument of divine favor hinges on an article of faith, the third uses knowledge derived by nature and, I believe, constitutes Bacon's core answer to the question. The goodness of longevity represents another of the theological tests described by Graham Rees.[26] The argument of divine favor demonstrates (to Bacon's satisfaction) that Scripture does not contradict the goodness of prolonging life while Christian charity adds impetus to the demand that we enact deliver this good to others. Nonetheless, the determination of its goodness proceeds through nature.

In passage 2, Bacon asserts, "Now it is easy to take this as the greatest good," where "this" refers to the prolongation of life. In Rees's translation given above, the sentence serves as a clause; however, in the original Latin text, it actually stands alone: *Verum ut hoc pro maximo Bono habeatur, proclive est*. Its placement makes it difficult to decide what makes holding longevity as the greatest good so easy. Is it because the continuation of charity is so clearly triumphant or because God so obviously considers longevity a boon? Neither inference is obvious. In fact, Bacon has been striving to convince readers not that longevity is the greatest good but that it is a good at all. Now, suddenly, he claims that its supremacy as a good is easy to see. The phrase that Bacon chooses to describe the ease of belief is "*proclive est*." Belief in longevity as the greatest good is as easy as falling down. Considerations preceding this sentence—the presumption of life as sin or affliction and the comparison of this life with the incommensurable joys of heaven—are the very things that make belief difficult. Bacon's claim of ease seems to have nothing to do with what has come before. The

[26] See previous discussion in Chapter 6.

conjunction beginning the sentence, "*Verum*," which also could be translated as "But," signals a re-direction of thought, and Rees's decision to collapse this sentence with the next tracks the movement: Bacon is setting up a contrast between the ease of sighting a goal and the difficulty of achieving it.

The switch from doubt to certainty reflects a change in the metric of judgment from the theological to the natural. This change is embodied in another instance of word choice. For the adjective to modify the kind of good (*bonum*) that longevity represents, Bacon selects "*maximum*." In my own translation, the line under question reads, "That longevity should be held as the greatest good [*pro maximo Bono*], is easy." Bacon does not make the ordinary choice here, "*summum*."

At first, his unusual choice may not look all that important, but it has a significant precedent in Bacon's intellectual milieu. Girolamo Cardano distinguishes between *summum bonum* and *maximum bonum* quite self-consciously. The Italian physician and philosopher receives several mentions in Bacon's texts, including *The History of Life and Death*. Scholars have noted the influence of Cardano's *De Subtiltate* on Bacon's inductive methodology.[27] More germane here, though, is Cardano's *De Sanitate Tuenda*, which, as the name implies, describes a course of hygiene along Galenic lines. The fourth and final book of *De Sanitate Tuenda* offers one of the most thorough gerontologies of the Renaissance. Part of this gerontology comprises what may be the first natural history of longevity in the early modern age, chapters that also may have supplied Bacon with some of his material in parallel sections of *The History of Life and Death*.[28] One of these, Chapter Three, opens thus:

> Quia vita est omnium, quae homini advenire possunt fundamentum, qui vitae diuturnitatem procurat, aut adipisci decet, maximum mortalibus beneficium praestat, tametsi neque vivere bonum esset, certe summum non est.

[27] See, for example, Jessica Wolfe, *Humanism, Machinery, and Renaissance Literature* (Cambridge: Cambridge University Press, 2004), 11-14. As Wolfe notes, Bacon's interest in the concept is discussed by Graham Rees, "Atomism an 'Subtlety' in Francis Bacon's Philosophy" *Annals of Science* 37 (1980): 549-571.

[28] Graham Rees calls Bacon's "collection of data" on human longevity "startlingly original" and asks, rhetorically, "Who before Bacon had made such a collection?" (OFB XII.li). Cardano is at least one.

> [Because life is the foundation of all things that can happen to a man who seeks or is fitting to obtain a long duration of life, life stands forth as the greatest benefice to mortals, and although to live is a good, certainly it is not the highest good.][29]

Life, according to Cardano, is the *maximum* benefice and good yet not explicitly the highest, or *summum*. The highest good transcends life altogether. In the next sentence, which defines death as the separation of the soul from the body upon the extinction of innate heat, Cardano implies that the *summum bonum* belongs to the afterlife.

Bacon states what Cardano implies. More immediately, Bacon's choice of "*maximum*" resonates because of what he says about the *summum bonum* in *The Advancement of Learning*. The relevant passage is II.20.4, quoted here in full:

> The doctrine touching the platform or nature of good considereth it either simple or compared; either the kinds of good, or the degrees of good; in the latter whereof those infinite disputations, which were touching the supreme degree thereof, which they term felicity, beatitude, or the highest good, the doctrines concerning which were as the heathen divinity, are by the Christian faith discharged. And as Aristotle saith, *That young men may be happy, but not otherwise but by hope*; so we must all acknowledge our minority, and embrace the felicity which is by hope of the future world.

In the corresponding passage, *De Augmentis* translates "the highest good" as one would expect, with "*summum bonum*." According to Bacon, Christian revelation has resolved the keystone debate of classical ethics and removed the focus of tension between all its various schools. The *summum bonum* remains happiness, as Aristotle and many others proclaimed; however, the supreme happiness is now known to be the otherworldly bliss of the saved. This revelation nullifies further debates about the loftiest happiness. Additionally, it renders human beings perpetual children till by spiritual translation they reach the maturity of their heavenly selves. From the higher perspective of heaven, Aristotle's happy and virtuous man occupies the place that, from the lower perspective of nature, an adolescent occupies. While on earth, human beings may only hope for the true *summum bonum*, not achieve it.

[29] The Latin text comes from *Opera*, ed. Sponius, vol. 6 (Lyons, 1663), 243. The translation is my own.

In light of textual evidence, Bacon would seem to pick his superlative carefully. The two phrases do not refer to the same thing. The *summum bonum* designates one good, the *maximum bonum*, another. But the distinction leads to further questions. Does the *maximum bonum* replace the *summum* as the highest good on earth? The *maximum bonum* identifies longevity or the prolongation of life. But how do we know that this is greatest? Or how do we know its greatness so easily?

In *The Advancement of Learning*, Bacon helps us to answer these questions, and their answers, according to him, do not suppose Christian faith. In the passage above, Bacon faults the doctrines of philosophers over the matter of goods "compared." (Bacon's appraisal of moral science splits first into "the platform of the good," or moral theory, and "the culture of the good," or education to morality. The platform of the good is divided into knowledge of goods simple and knowledge of goods compared.) Deprived of true faith, philosophers have engaged in useless squabbling about the *summum bonum*, and after a point their rankings of goods fall into confusion. Bacon goes on to commend the philosophers, however, for their analyses of goods "simple." Without the benefit of faith, they nevertheless have "excellently" described "the forms of virtue and duty," distributed various virtues and duties in their proper kinds and actions, and persuaded readers to goodness "as much as discourse can do." They even have "excellently handled" certain aspects of goods compared, such as the division of contemplative and active lives, the distinction between "honesty and profit," and the balance of virtue with virtue (II.20.5). Philosophy, according to Bacon, can get much about morality right without the aid of faith.

In fact, as Bacon proceeds, it becomes clear that the only thing that divine revelation shows that man alone cannot determine is the true conception of the highest good. This true conception works as a tonic to philosophy, as Bacon states after defining the *summum bonum*:

> Freed therefore and delivered from this doctrine of the philosopher's heaven, whereby they feigned a higher elevation of man's nature than was, (for we see in what a height of style Seneca writeth, *Vere magnum, habere fragilitatem hominis, securitatem dei*), we may with more sobriety and truth receive the rest of their inquiries and labors.

The right definition of the *summum bonum* curtails arrogating too much to human happiness. It reduces our expectations of happiness in the present life should we expect happiness to be in every way as perfect and enduring as it promises to be in heaven. The faithful recognition of the *summum bonum* does not, however, totally re-organize lower goods or resolve other questions concerning them. Instead, natural reason continues to perform the tasks of denominating goods and plotting their values. Religious faith only confirms its answers. Although Bacon additionally chides philosophers for not having delved deeply enough into goods simple, he blames this shortcoming "specially" on their not having "consulted with nature" and on their having shifted too quickly from nature to popular opinions. Bacon rectifies what they have either omitted or distorted, beginning with an argument for "the double nature of good":

> The one, as everything is a total or substantive in itself; the other, as it is a part or member of a greater body; whereof the latter is in degree the greater and worthier, because it tendeth to the conservation of a more general form. (II.20.7)

His subsequent proofs of the superiority of the second kind of good derive from experience. They feature inanimate objects of nature. Although in small quantity lead moves to the lodestone out of sympathy, if it exceeds a certain size, it "forsaketh the affection of the lodestone," and turns to the earth, meaning that it stays put. Similarly, heavy and gross bodies normally seek the earth as their connatural, but rather than "suffer a divulsion in the continuance of nature," they will fly upward from the earth "out of duty to the world."[30] The principle elicits from Bacon the deepest distinction between human goods, private and public, to the preference of the latter:

> This double nature of good, and the comparative thereof, is much more engraven upon man, if he degenerate not: unto whom the conservation of duty to the public ought to be much more precious than the conservation of life and being: according to that memorable speech of Pompeius Magnus, when being in commission of purveyance for a famine at Rome, and being dissuaded with great vehemency and instance by his friends about him that he should not hazard himself to sea in an extremity of weather, he said only to them, *Necesse est ut eam, non ut vivam*.[31]

[30] The second example of dense, massy bodies is clearer in the corresponding section of *De Augmentis* (VII.1). There Bacon says that even such gross bodies will revert upward and away from the connatural earth rather than permit a vacuum (SEH I.717, V.7).

[31] This represents a crucial distinction between Bacon's moral theory and that of Thomas Hobbes, expressed in *The Leviathan*. According to Hobbes, all social duties arise logically from the sole natural right of the individual's self-

The principle of the superiority of public good does not originate with the Christian religion, to which Bacon turns next; however, no "philosophy, religion, or other discipline" has "so plainly and highly exalt[ed] the good which is communicative, and depress[ed] the good which is private and particular, as the Holy Faith." The coincidence testifies to the fact that the God who gave Christian law also implanted the laws of nature by which such things as iron and gross masses act. Bacon says that, like those inanimate objects, saints "have wished themselves anathematized and razed out of the book of life, in an ecstasy of charity and infinite feeling of communion." With "this being set down and strongly planted," Bacon is able to decide "most of the controversies" hobbling moral philosophy, and in each case the triumph goes to communicative good; for example, the active life over the contemplative. Ensuing upon a sentence about Christian faith, the word "this" has a vague antecedent, as does the "it" in the series of sentences following that begin either "it decideth" or "it censureth." But the thing set down and strongly planted that also decides such controversies and censures the answers that prefer private good is the principle of the superiority of the public good. This principle is manifest in nature, not a secret article of faith.

Consequently, philosophy, or, better yet, a renewed philosophy that takes better account of the nature of things, discovers it. The content of the *maximum bonum* constitutes part of this discovery. The ease with which we know that the prolongation of life is the greatest good reflects an interior impulse of nature. Like iron drawn to magnets or a heavy body seeking the earth, we have desires implanted in us by nature, and Bacon appears to be following a long-standing tradition of philosophical discourse whereby we naturally seek the good and flee the evil.[32] After separating private and public goods, he divides private good into two sorts, active and passive:

> for this difference of good, not unlike to that which amongst the Romans was expressed in the familiar or household terms of *promus* and *condus*, is formed also in

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preservation; according to Bacon, social goods arise parallel to individual goods. From Hobbes's perspective, I think that Bacon's analysis fails to explain, on mechanical grounds, why the communicative good is "worthier." Bacon is more comfortable than is Hobbes with a value judgment resting at the basis of his theory.

[32] This commonplace idea nonetheless admits diversity of opinion. In question are what does the seeking and how much authority it has. Does reason alone seek the good? Does it have sole authority to determine the good? Roman Stoics answer yes. As Bacon's examples of magnets and massy bodies foretell, he extends authority to other capacities.

> all things, and is best disclosed in the two several appetites in creatures; the one to preserve or continue themselves, and the other to dilate or multiply themselves. (II.21.1)

The passive, private good further branches into conservative and perfective subdivisions. At this fork Bacon provides a neat encapsulation of the preceding declension:

> For let us take a brief review of that which we have said: we have spoken first of the good of society, the intention whereof embraceth the form of human nature, whereof we are members and portions, and not our own proper and individual form: we have spoken of active good, and supposed it as a part of private and particular good: and rightly, for there is impressed upon all things a triple desire or appetite proceeding from love to themselves; one of preserving and continuing their form; another of advancing and perfecting their form; and a third of multiplying and extending their form upon other things; whereof the multiplying, or signature of it upon other things, is that which we handled by the name of active good. (II.21.2)

Both public and private goods concern the preservation of "form." Private and public differ, however; whereas all three private goods descend from the same basic appetite, the love of one's individual form, the public good serves the form of human nature at large, into which we as individuals fit as parts. Of the private goods, the active designates those outlying things upon which one seeks to multiply one's individual form, especially works and deeds. The passive also portends to one's individual form; however, of its two branches, the conservative signifies preservation "in state," while the perfective signifies preservation "with advancement."

As the *maximum bonum*, the prolongation of life, I believe, belongs among the first of the two passive, private goods, that is, the conservative. Underlying other goods by its priority in time, it results from the desire of creatures to preserve or continue themselves, the definition of the passive sort of good. Whether it fits with the conservative or perfective version of the passive good, though, is a harder question. As Bacon formulates the prolongation of life, it depends upon reaching, maintaining, and restoring a youthful condition, or wearing out the body as little as possible. It intends more than just eking out existence. It also supposes the perfection of the body's function, strength, and substance; it may even suppose the transcendence of usual norms if it is possible to enhance the peak of functioning beyond what one expects to find for a particular person or for the human race as a whole.

When defining the passive-perfective good, however, Bacon identifies the "divine or angelical nature" as the perfection of the human form. His idea of a perfective good verges on the Neoplatonic: all creatures in the scale of creation desire to be like that which ranks above them.[33] The passive-perfective good corresponds to the desire to transcend human nature and approach something superior. Unfortunately, Bacon explains less about the passive-perfective good than about any other, instead concentrating on its perversion when "advancement local" and "ambition" substitute for its true image. Nonetheless, we may be able to infer its true image. The phrase "divine or angelical nature" connotes spirit or mind rather than body, and "passive" indicates a state of spirit or mind before it manifests in action. Later, Bacon says, "the minds of men are at some times in a state more perfect, and at other times in a state more depraved" (II.12.14). To the passive-perfective category of goods seem to belong the intellectual virtues touted by classical philosophy as well as moral dispositions determining action. The latter are perhaps the more crucial, according to Bacon, especially "love," which "doth exalt the mind, and nevertheless at the same instant doth settle and compose it" (II.12.15). Alone among virtues, charity "admitteth no excess." The divine perfection of human nature consists largely of increasing feelings of charity: "by aspiring to a similitude of God in goodness or love, neither man nor angel ever transgressed, or shall transgress" (II.12.15).

Similarly, the passive-conservative good implicates more than just the maintenance of bare existence; it also implicates the "fruition" of human nature, which is a kind of perfection. This perfection, however, occurs within the bounds of the body:

> To resume the good of conservation or comfort, which consisteth in the fruition of that which is agreeable to our natures; it seemeth to be the most pure and natural of pleasures, but yet the softest and the lowest.

For the words "natures" and "natural" here one can substitute, I think, "bodies" and "bodily." The angelic or divine nature surpasses our natures, as Bacon maintains the rational soul does. By default,

[33] "For in all things there are some nobler natures to the dignity and excellence whereof inferior natures aspire to as to their sources and origins" (SEH V.12). *The Advancement of Learning* of 1605 lacks this sentence.

the passive-conservative good pertains to the body or everything in our natures besides the rational soul.

As a good of conservation, the prolongation of life ranks among the "lowest" of goods, below even the perfective good. It occupies the absolute floor of goods. This idea of a floor is what Bacon captures with the expression "*maximum bonum*." The adjectives imply the distinction: "s*ummum"* bespeaks height whereas "*maximum"* bespeaks size. The *summum bonum* is the highest good; the *maximum bonum*, the largest.

The earlier quotation by Cardano distinguishes between the two goods in the same sense, and Bacon reasons similarly, I believe, though not identically, to Cardano. Cardano argues that life is the greatest good because it serves as the foundation for all others. Life is the largest, most basic, and encompassing good. Health is better and higher, he believes, for health improves upon life. Even so, health arises from the same ground as every other good.[34] Bacon implicitly agrees with the idea that life is a good instrumental to all other goods. His word "*maximum*" acknowledges the hardnosed reality that any good on earth, even a spiritual good available here, necessitates life first. Life lays a basis that captures all other goods in its breadth. More life enables more goods and better goods even if the highest good lies in the opposite of life, death. Rather than noble and truly best, the greatest good is, paradoxically, a good most base.

Still, as we have just seen, Bacon adds something else to Cardano's thought. The goodness of longer life reflects more than the simplicity of a logical conclusion. It reflects an impulse of nature. With ease we know that longer life is the greatest good because the need of life for all other goods is obvious but, more immediately, because we experience a natural appetite for life, the satisfaction of which results in pleasure. The perfection of bodily function and health consists "in the fruition of that which is agreeable to our natures." With this fruition come the most pure and natural of pleasures, which are sensual pleasures, the greater part of the passive good.

[34] Because Cardano sees little chance of keeping or restoring health for the elderly since health truly belongs to youth, he defines geriatrics as a project of maintaining life. Like Bacon, Cardano judges health by peak of functioning seen across a lifetime; he does not adjust the standard along a presumed trajectory of decline.

According to Bacon, the goodness of prolongation of life is known by nature where "nature" takes on the dual senses of natural reason and natural pleasure. Its goodness is thus a concern of philosophy. Philosophically, Bacon evaluates long life in a manner quite like that of Aristotle although as a whole his platform of goods differs in marked ways from the moral doctrines of all major schools of classical philosophy.

In classical philosophy, the *summum bonum* is happiness, and longevity was thought to have two possible relationships to happiness. Historically, a story by Plato divided the two views. In *Gorgias* and *The Republic*, Socrates argues that a truly virtuous man is happy no matter what afflictions beset him; a virtuous man who suffers deprivation, imprisonment, public spite, and torture remains happy, whereas a wicked man who enjoys riches, freedom, political rule, and pleasures is actually miserable. Plato's example is often called the virtuous man "on the rack." The defense of his happiness rests upon a conception of happiness as a proper and natural order of the three parts of the soul (intellect, spirit, appetite).[35] True happiness can emerge only when the best part, the intellect, rules, which necessitates the recognition and choice of the good, operations often clouded and disrupted by the lower parts. The wicked man sacrifices genuine happiness for apparent advantages that the lower parts of his soul desire.

Socrates and his auditors do not include long life among the advantages the wicked man acquires and the virtuous man loses. Later, however, Aristotle does, but to the confutation of Socrates. His lines are some of the most famous in the *Nicomachean Ethics*: although happiness consists of the work of the soul in accordance with virtue, and especially the best virtue, this must be "in a complete life. For one swallow does not make a summer, nor does one day, and so too one day, or a short time, does not make a man blessed and happy."[36] Whereas Socrates implicitly removes

[35] See *The Republic*, 583b-592b.

[36] 1098a. The translation is by W.D. Ross and J.O. Urmson (Princeton, NJ: Princeton University Press, 1984).

length of life from the equation of happiness, Aristotle restores it. He distinguishes three kinds of goods: external, such as riches, power, and good fortune; of the body, such as strength, health, beauty, and pleasure; and of the soul, such as the moral and intellectual virtues. Long life constitutes either an external or bodily good, or both, but happiness depends mostly on virtues of the soul. Nonetheless, unlike Socrates, Aristotle insists that "someone who is happy has need in addition of the goods of the body, and of goods that are external and from fortune, in order that he may not be impeded on account of them."[37] Happiness according to Aristotle is a self-sufficient and complete and therefore unimpeded state realized when a soul performs the best actions for which it was made.[38] External and bodily evils hinder its progress toward happiness or upset happiness when attained. Aristotle scoffs at the notion that a virtuous man suffering torture and misfortunes can be happy.[39] Happiness surpasses external and bodily goods but requires them too, or at least requires some minimal amount of them. Among these, length of life is especially important. Aristotle says that all things desire life for pleasure, which brings activity to completion. Happiness is an elevated pleasure bringing human life to completion.[40] It culminates a process requiring a life of a certain but unquantified length.

After Aristotle, the Roman Stoic Seneca recites the opinion of Socrates but with added emphasis on longevity. In his *Epistles* and the essay *De Brevitate Vitae*, he argues that only virtue constitutes the good; bodily and external goods are actually *adiaphora,* matters of indifference, standing beyond rational choice and therefore beyond the achievement of human perfection.[41] For Seneca, happiness describes a state of natural fulfillment, as it does for Aristotle. Like Socrates, however, Seneca limits happiness to the soul and, more specifically, to the intellect's recognition and

[37] 1153b.

[38] 1098a, 1153a-b.

[39] 1153b.

[40] 1175a.

[41] Epistle 82.9-12.

choice of the good.[42] Human perfection arrives with wisdom.[43] In his epistles, he contends that longer life does not increase happiness; only *securitas*, or the freedom from care over things subject to fortune, can produce happiness, which is synonymous with virtue, which is synonymous with honor, which is synonymous with wisdom.[44] Paradoxically, a truly long life consists of the culture of wisdom no matter for how brief a time, whereas a chronologically long life without wisdom is no life at all, lacking what fulfills the human creature.[45] Virtue, happiness, honor, or wisdom evolves from a robust self-control that has successfully replaced the attractions associated with external and bodily fortunes with the attractions of a moral obedience. In such an ethic, the choice between continuance of life and suicide poses a profound test; because mere life is inferior to life replete with virtue, one should choose death before committing a crime against right reason, which Seneca also identifies with nature.[46] Not surprisingly, Seneca affirms the Socratic claim that the virtuous man on the rack is happier than the vicious man in freedom[47] but adds that the virtuous man will suffer death before living without virtue and wisdom.[48]

The ethical philosophy of Epicurus and Lucretius resembles the Stoic more closely than sometimes supposed in the Renaissance. Although it comes to a similar conclusion about the value of long life, it reaches the conclusion by a different path. Epicurus teaches that the *summum bonum* is really pleasure but not just kinetic pleasure of the body, which begins with pain or desire, culminates with their relief, and lasts only a short time. The greater pleasure is *ataraxia*, a condition of freedom

[42] According to Seneca, happiness represents the final point that human perfection reaches and therefore becomes synonymous with virtue. He takes "*summum bonum*" literally, as the peak alone, without the mountain underneath holding it up. According to Aristotle, although moral and intellectual virtues represent the apex of human development, they do not discount other, supporting goods. Virtues contribute to happiness but do not supplant it.

[43] Epistle 93.8. *De Brevitate Vitae*, 14.

[44] Epistle 32.5, 44.7, 49.12, 76.6-17, 90.1-2.

[45] Epistle 93.2-4, *De Brevitate Vitae*, 2, 14-16.

[46] *De Otio*, 8.

[47] Epistle 76.32-5.

[48] Epistle 76.27-9.

from pain which the soul experiences when it learns to accept the natural limits of pleasure.[49] The flesh knows no limits to its pleasures and therefore needs boundless time for their fulfillment. The mind, however, by recognizing the limits to fleshly pleasures and reasoning away the fear of death, orchestrates a happy life within the bounds of mortal existence.[50] To this end, the virtues, though admirable, are subservient.[51] Above all, one must use knowledge to conquer the natural fear of death, a topic to which Lucretius devotes Book III of *De Rerum Natura*. When pleasures have reached their end, one should accept death with a calm spirit. In the famous "diatribe" against the fear of death, Lucretius has a personified Nature scold an old man who desires to continue eking out existence: "[W]hy not, like a banqueter fed full of life, withdraw with contentment and rest in peace, you fool?"[52] But even if life does not sink into the miseries of old age, one should still prefer to make an end of life, because nature can offer no new pleasures that one has not already experienced and because the eternity of death will always swallow up the span of life, no matter how long.[53]

The names Socrates, Aristotle, Seneca, and Epicurus recur in *The Advancement of Learning* II.20, but of course their opinions do not arrive to Bacon totally unadulterated. A text coloring their later reception, especially that of their conflicting ideas about the *summum bonum*, was Cicero's dialogue *De Finibus Bonorum et Malorum*, which features Epicurean, Stoic, and Academic characters debating the content of happiness.[54] Notoriously so, Cicero caricatures and dismisses the Epicurean

[49] Diogenes Laertius 10.136-8, 2.88-90, 10.139-54 (maxims iii, x, xx, and xxi).

[50]Diogenes Laertius 10.139-54 (maxim xx).

[51]Diogenes Laertius, 10.139-54 (maxim v).

[52] DRN III.938-9.

[53] DRN III.944-51, 1080-94.

[54] I suspect that Bacon knew Cicero's *De Finibus* quite well. If nothing else, his appraisals of classical atomism evince familiarity with it. In *Meditationes Sacrae* (1597), Bacon arraigns the "figment" of the Epicurean swerve, which he says "has ever by the wiser sort been accounted a very empty device" (SEH VII.241, 253). The wiser sort would seem to include, most prominently, Cicero, who in *De Finibus* famously attacks the Epicurean swerve as a ridiculous and "childish" emendation to Democritean atomism (I.18-21). In *De Principiis*, Bacon claims that Cicero always mentions Democritus with highest praise, which exaggerates but nonetheless acknowledges Cicero's clear preference for Democritus over Epicurus in *De Finibus* (OFB VI.204-5).

view as intellectually confused and morally lax.[55] His representations of Stoic and Peripatetic (Old Academy) views, for which he has greater affinity, are fairer.

Cicero's Stoic and Peripatetic speakers agree that everything in nature has its *telos* called its *summum bonum* and that the *summum bonum* of living things represents their happiness, expressed in the principle "living according to nature." Human beings must live according to nature in order to be happy.[56] The speakers also agree that the desire for happiness proceeds from a natural impulse of self-love, which demands that creatures seek and retain whatever preserves them in their best state and avoid whatever harms them. Instinctively, all living things desire to fulfill their natures.[57] This instinct, furthermore, develops gradually. First, infants seek the goods of the body, food, drink, and sleep, which produce pleasures, and avoid the evil of the body, pain. As the mind develops, children discover its goods, too, although they often use them as instruments for obtaining future pleasures and avoiding future pains; children, unlike infants, have some sense of themselves as enduring through time. At maturity, however, adults come to apprehend virtue and to pursue it for its own sake, solely for its "splendor."[58] These speakers agree that virtue represents the peak of human perfection. Contrariwise, they both confute the opinion that Cicero puts in the mouths of Epicureans, which holds that bodily pleasure is the sole good and the only source of happiness. Instead, if there are multiple goods, the greatest by far is virtue.

The Stoic and Peripetetic speakers part over the "if" clause. The Stoic character argues that virtue annihilates the goodness of preceding goods. Virtue is the only good, for it represents the best state of humanity. The other supposed goods are really "advantages" (*commoda*). The Aristotelian character maintains, by contrast, that even in their best state human beings remain creatures of body, mind, and society. Thus human happiness depends upon all facets of human life. Not only do goods

[55] Cicero's indictment of Epicureanism, delivered in his own voice, fills Book II.

[56] III.20-6, IV.14-8, 41, 47.

[57] III.16, IV.16.

[58] IV.37; II.45, III.21, 23-4, 26.

of the body, such as health, beauty, and longevity, affect happiness, so do the external goods, such as family, friends, wealth, and political community. Cicero places himself in the dialogue as a defender of an "Academic," Aristotelian view. He scoffs at the "man on the rack" whom, he says, the Stoics vaunt as the exemplar of happiness. The Stoic character is Cato the Younger, who killed himself on the very principle that Academics scorn just a year before Cicero wrote his dialogue.

In the dialogue, longevity opens a major fault-line. In Books I and II, Cicero handles the "Epicurean" account of the *summum bonum*. He argues that if the only good is bodily pleasure, as he takes Epicureans to claim, then the wise man who practices the good must desire a long duration of life (contrary to what Epicurus and Lucretius expressly say).[59] Opposed to this view is that of Cato the Younger, the Stoic, who in Book III argues that, since virtue is the only good, the duration of life is a matter of indifference. What matters to achieving happiness in the peculiar, Stoic sense is meeting the pattern of goodness designed for humanity by nature, and one can achieve this kind of success no matter life's duration. Not surprisingly, Cicero-as-Aristotelian takes an intermediate position. He cites a lost book by Aristotle's pupil, Theophrastus, that apparently defended the importance of longevity and other goods of fortune to human happiness.[60] (Theophrastus subsequently became famous for his deathbed lament that human beings, who develop arts and philosophy, live more briefly than unreasoning animals such as crows and serpents—a story recounted by Cicero in *The Tusculan Disputations* and condemned as unbecoming of a philosopher in the opening pages of Seneca's *De Brevitate Vitae*.[61]) But as Cicero defines it, the Peripatetic view also sets virtue above pleasure and characterizes life as an instrumental good, the means by which the soul ennobles itself.[62]

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[59] II.87-9.

[60] V.12.

[61] Cicero, *Tusculan Disputations* III.28 and Seneca, *De Brevitate Vitae*, I. Seneca mistakes Aristotle for Theophrastus.

[62] *De Finibus*, IV.32-41.

From the foregoing survey of classical philosophy, it is worth noting a problem resonating in the disagreements over the *summum bonum*. This pertains to the conjunction of the good with happiness. Happiness refers to a subjective state, an affect of the soul, whereas the performance of good does not necessarily entail enjoyment.[63] Seneca describes happiness as an objective condition, the achievement for oneself of an ideal, of that which one considers praiseworthy.[64] Education to virtue consists of training oneself to find pleasure only in something that earlier in life one would not have found pleasurable at all, and the achievement of an objective ideal may displace pleasure altogether if it includes the elimination of one's own being. At the other end, the Epicurean caricature rendered by Cicero (perhaps, more accurately, a Cyrenaic position) defines happiness subjectively, as a feeling. It coincides with sensual pleasure. In the *Nicomachean Ethics,* Aristotle fuses the two extremes. Happiness is a pleasure, but an elevated kind of pleasure, because, unlike bodily pleasures, it does not emerge with the filling of a lack; nonetheless, it denotes a sense of well-being about oneself arising with the achievement of goods suited to the human nature, the best of which are not satisfactions of the body.

Bacon's platform of goods differs from the moral theories of most classical schools of philosophy mentioned above because of its decisive preference for "goods of communion." The exceptions that Bacon notes are Zeno of Citium and Socrates, both of whom practiced philosophy in the Agora of Athens. Otherwise, Aristotle, Epicurus, and Seneca, according to Bacon, glorify the retired life of intellectualism, a view not without justification, even of Aristotle, who rates intellectual virtues higher than active. For Bacon, the continuance of life compares meanly to other goods ultimately because of two things, his observation that everything in nature expresses a double nature of the good and his judgment that the good attending the more general form is worthier than that attending the individual form. Although the observation may describe natural phenomena, as Bacon

[63] In his new book *The Ends of Life; Roads to Fulfillment in Early Modern England* (Oxford: Oxford University Press, 2009), Keith Thomas observes a similar duality of meanings of "fulfillment," one a full development of capacities and the other a gratification of desires (8-9). Unfortunately, his book appeared too late for me to make more use of it in my dissertation.

[64] Epistle 76.10-14.

attests, the judgment reflects an anticipatory preference that carries through the rest of his appraisal of moral science: extroverted goods outweigh their introverted counterparts. Once again, Bacon exposes a predilection for dichotomies, and this dichotomy mirrors another one important to his philosophy of matter, outward-seeking versus inward-sustaining.

Just beneath the *summum bonum*, from which the goods of this world are cut off, public duty dominates its counterpart, private good. Of all goods besides eternal salvation, public duty has the greatest worth. The preeminence of society, furthermore, decides many controversies of ethics. It favors the active over the contemplative life (because only God and angels can live as spectators), thus chastising Aristotle, and the active virtue of Socrates and Zeno over the retired pleasures of Epicureans and Pyrrhonists (because such virtue braces society). It also censures Epictetus for believing that happiness accords only with what we can control, thereby abandoning political life to fortune; the whole class of professional philosophers for abstaining altogether from "temptations and perturbations"; and any philosopher present or past who retires from civic duties "too easily" (II.20.8-12).

On the side of the private goods, the active variety likewise excels the passive. Being a private good, the active does not necessarily equal public beneficence although it may coincide with it. Instead, it keeps "respect private to a man's own power, glory, amplification, continuance." It overshadows the passive good nonetheless, because the appetite of all creatures "to dilate or multiply themselves" is worthier than their appetite "to preserve or continue themselves." The appetites of multiplication and preservation, as we saw in Part Two, are Bacon's fundamental motions of matter. Here, the superior worthiness of the active good rests mostly on public opinion. We consider the agent heaven worthier than the patient earth, as we also rate it better to procreate than to feed and to give than to receive. Additionally, no person's spirit is "so soft, but esteemeth the effecting of somewhat that he hath fixed in his desire, more than sensuality." Bacon uses one insight not rooted in public opinion to defend the superiority of active good, which is that mankind by nature possesses an "affection" toward variety that "upholds" the preeminence of the active good. The sensual pleasures

making "the principal part of the passive good" cannot offer this affection much latitude, but the "enterprises, pursuits, and purposes of life," expressing much greater variety, can (II.21.1).

On the side of passive goods, the perfective outshines the conservative, for "to preserve in state is the less, to preserve with advancement is the greater." If previously I interpreted Bacon aright when I said that a disposition to charity makes up the largest part of the perfective good, even this passive good is sociable or other-directed.

As a good, the prolongation of life falls below all goods just listed because of its selfish confinement. But not only does it occupy the bottom rung of Bacon's scale of goods, all along this scale it suffers demerit. Several times, Bacon uses continuance of life as a foil to goods of greater worth. I already have quoted the story of Pompey the Great and his speech, "*Necesse est ut eam, non ut vivam*," or "It is necessary that I go, not that I live." The example illustrates Bacon's point that to anyone not "degenerate" public duty "ought to be more precious than the conservation of life and being." The avowal echoes Bacon's admonition in *The History of Life and Death* that the pursuit of longevity not interfere with the offices of life. Bacon also deflates the good of longer life when he reproves the opinion of the Stoic Epictetus that happiness derives solely from things over which we have control, not from things subject to fortune. According to Bacon, Epictetus speaks "as if it were not a thing much more happy to fail in good and virtuous ends for the public, than to obtain all that we can wish to ourselves in our proper fortune" (II.20.11). The length of life is a thing subject to fortune and worth risking, according to Bacon, for more meritorious ends. A third example confirms his point. Approvingly, Bacon quotes the Spanish general Consalvo de Cordoba out of Guicciardini's *History* as he addresses his troops before battle: "He had rather die one foot forwards, than to have his life secured for long by one foot of retreat" (II.20.10).

Despite its importance to Bacon's conception of science, the continuance of life does not eclipse all other goods, demand the sacrifice of all else to its fulfillment, or overthrow values of public service and action; quite the opposite. Public duty and the more sociable goods warrant first choice. Bacon's depreciation of the conservative good accords with the relatively low value placed

upon long life by all the classical philosophies surveyed above although his clear preference for duty over contemplation differentiates his moral theory from many of theirs. On this point, that with which his would seem to disagree most is the Epicurean. Whereas Epicurus and Lucretius teach the utility of virtue for pleasure, Bacon insists that the goodness of public duty has a source apart from the individual, and pleasure of either kind, kinetic or static, resides, with the continuance of life, at the lowest level of Bacon's platform, as the thermometer of being's "fruition." In fact, although overall Bacon's moral theory drifts far from the Epicurean position, his analysis of pleasure accompanying the conservation of life stands upon Epicurean assumptions.

Although lowly, the good of conservation is still a good, and its goodness is indicated by pleasure. What form pleasure takes is the question that organizes Bacon's discussion of the passive-conservative good. A final division of goods occurs at this level. It originates over dueling conceptions of sensual pleasure, the major part of passive good.

The first way Bacon evinces an allegiance to Epicurus is that he jumbles pleasure and happiness, which Plato, Aristotle, and Seneca are careful to distinguish. From their standpoint, Bacon deals with pleasure but often uses philosophical arguments about happiness to interpret it. Along with equating happiness and pleasure, he interchanges states of mind with states of body. Ostensibly, Bacon is speaking about the body insofar as it enables "sensual pleasures," but he applies to it the traditional conception of tranquility of mind. Perhaps the substitution signals doubt that either mind or body is wholly responsible for our feeling pleasure. Nevertheless, there is something Epicurean about these two positions, and his subsequent bifurcation of pleasure also reproduces an Epicurean dichotomy.

About the "the good of fruition or contentment" Bacon entertains two views that, he says, have arisen in debates about pleasure. As he explains, some expositors, such as Socrates, have maintained that "felicity" describes "an equal and constant peace of mind," whereas others, such as the sophist Callicles, have maintained that it describes "much desiring" followed by "much

enjoying."[65] The first view looks for felicity in "the sincereness of the fruition," or in static pleasure, while the second, looks for it in the "quickness and vigor" of fruition, or in kinetic pleasure. The first view, which is defended by "the general consent even of the Epicures themselves," according to Bacon, takes felicity or pleasure to be "an equal and constant peace of mind," a kind of tranquility not unlike that of Stoic *securitas*. Accordingly, pleasure consists in "clearing perturbations." The second view takes happiness or pleasure to consist in the active satisfaction of appetites. From the first perspective, a pleasure or happiness like that defined by the second is the felicity of "itch and scratch." From the second perspective, a pleasure or happiness like that described by the first is "the felicity of a block or stone" (II.21.3-4).

Bacon does not commit to one view over the other, because he thinks the whole debate tilts on an either-or fallacy; human nature is capable of both kinds of pleasure. Although Bacon considers the question whether human nature is capable of both "a question not inquired," his answer echoes that of Epicurus and Lucretius, who implicitly admit both kinds. For Bacon, the good of conservation comprises a final wedge because the conservation of being elicits a kinetic pleasure upon the satisfaction of bodily appetites, such as those for food and drink, yet it also allows for a static pleasure upon the freedom of the body from disease, pains, and weakness (perhaps the pleasure of health). Not surprisingly, Bacon esteems the sophist's kind worthier. It "show[s]" more akin to the "good of advancement" than does "a good of simple preservation" and therefore excels the other (II.21.4). Bacon's language of appearance needs emphasis; the sophistical kind of pleasure truly does not express advancement, only the illusion of advancement, like motion in a circle. It, like its more static counterpart, remains a conservative good.

Bacon's blending of pleasure and felicity raises the possibility that he sunders the good and happiness, but this is not the case. He also speaks of public duty and other, more active goods as contributing to human happiness. Though somewhat confusedly, he distinguishes two kinds of happiness, one at the level of the conservative good and identified with pleasure, and another

[65] Bacon seems to refer to the exchange between Socrates and Callicles beginning at *Gorgias*, 495a.

encompassing all goods and signifying some kind of subjective state of well-being. His hazy distinction mirrors Aristotle's effort to explain how true happiness unites the practice of virtue with a feeling of pleasure that nevertheless is not pleasure as normally understood. Consequently, it also underscores the Aristotelian and Stoic concerns with educating sensual youths into virtuous adults.

If read in reverse, Bacon's scale of goods presents something like the Peripatetic and Stoical accounts of progressive goods given by Cicero's *De Finibus*. Although taxonomic rather than developmental, it locates the roots of all goods in preservation of natural form, either the individual's or humanity's. The desire for preservation of form expands from the pure and natural self-preservation of the individual into a nobler sort that assumes the individual as a member of a larger moral order.

The preeminence of the communal good underscores the importance of "the culture of the good," a subject Bacon finds desperately wanting in all classical philosophy. As defined by Bacon, the culture of the good, which ensues upon moral theory, refers to the practicum of "how to attain these excellent marks, and how to frame and subdue the will of man to become true and conformable to these pursuits" (II.20.1). The difficulty of its task is apparent in the story of the military commander Consalvo de Cordobo, who insisted that "he had rather die one foot forwards, than to have his life secured for long by one foot of retreat." For Bacon, the case of Consalvo exemplifies the superior worthiness of public duty. Bacon also uses it to explain how doing public duty can be not only better but "more happy." He reads Consalvo's speech in light of Proverbs 15:15: "a good conscience is a continual feast." The verse uses sensual pleasure ("feast") to explain a happiness of a higher order, which it optimistically describes as "continual." The sensuality of a feast confronts the attractions of longer life while the perpetuity of a good conscience opposes the Stoic doctrine of a centripetal happiness unshaken by fortune. In Bacon's reading, Consalvo appropriately weighs the pangs of conscience he shall suffer if he retreats. In the balance are the good of life and the good of duty, both of which, according to Bacon, have an innate pull on human nature, or at least should for someone who is "not degenerate." Certain Stoics (Epictetus) make the mistake of supposing that a

philosopher in "retreat" (Bacon capitalizes on the word) can be happy while ignoring this other side of human nature. Thus, the example of Consalvo substantiates a decisive moral principle, which is also backed by the authority of Scripture: "the conscience of good intensions, howsoever succeeding, is a more continual joy to nature, than all the provision which can be made for security and repose" (II.20.10).

The statement nonetheless fails to solve a problem confronting both Stoic and Aristotelian ethics, namely, how this "joy" continues when intentions do not succeed, that is, when one is dead. If the prospect of joy attracts one to self-sacrificing duty, the loss of all capacity for feeling poses a large obstacle in the way of commitment to duty. Additionally, life itself may offer some pleasure that can dampen the guilt that one would endure by living. Such considerations underscore the importance to Bacon's theory of moral education. A person will not choose aright if degenerate. Conversely, an upright character will consider death a better substitute to shame. The preference of death to shame emerges, according to Bacon, when one recognizes the priority of the human form over individual form.

The need for moral education underscores, in turn, the ambiguity of "nature." Although supposedly everything by nature responds to dual goods—one directed toward its substantive self and another directed toward its communal self—a person does not respond to one or the other according to some inviolable and propulsive law, the way iron responds to a magnet. If one did, one would not require the culture of the good. Instead, the good of conservation, the lowest kind of good, is the "most pure and natural" of pleasures, whereas higher goods or felicities, especially public duty, require for their fulfillment a proper education of the will. Although, as Bacon contends, the "double nature of the good, and the comparison thereof, is much more engraven upon man" than upon other creatures, apparently something more is needed for man to choose what has been engraved.

Although Bacon adapts Peripatetic and Stoic theories of ethical development and winds up struggling with the same core problems that they encounter, he enforces differences between his moral science and theirs. One of the differences separating his from both is, as noted, the insistence

upon the priority of communal good, which, as Bacon says, decides against cloistered study and Epictetus. But Stoic theory elicits more objections from Bacon than does Peripatetic. From Stoic theory, Bacon maintains two additional distinctions. One, mortality upholds the active good. According to Bacon, knowledge of our death raises the value of active goods and lowers the value of passive:

> [The] priority of the active good, is much upheld by the consideration of our estate to be mortal and exposed to fortune. For if we might have a perpetuity and certainty in our pleasures, the state of them would advance their price: but when we see it is but *magni aestimamus mori tardius*, and *ne gloerieris de crastino, nescis partum diei*, it maketh us to desire to have somewhat secured and exempted from time; which are only our deeds and works: as it is said *opera eorum sequuntur eos*. (II.21.1)

Bacon's statement that a constancy of pleasure would increase its price echoes the argument made in Cicero's *De Finibus* that hedonists must of necessity desire longer life as an expansion of pleasure. But Bacon challenges the hypothesis of perpetual pleasure with both mortality and fortune. Not only does death eventually cut off the possibility of pleasure, fortune upsets pleasure before death ever arrives. The Latin quotation reading, "We value it a great thing to die later," comes from Seneca, whose line, "But it is great to have the fragility of man but the security of a god," Bacon previously used as an example of philosophy's exaggeration of human happiness. The previous quotation equally applies here. According to Bacon, the main reason that the philosopher's *summum bonum* cannot exist is mankind's susceptibility to fortune, but whereas Seneca takes human fragility as cause to extol those things over which one has control—the passive-perfective goods in Bacon's scheme—Bacon uses it as reason why human beings pursue active goods and esteem them higher than passive. Tellingly, Seneca attempts to describe the way things should be; Bacon, the way things are.

The other difference between Bacon's moral science and the Stoic is their stances on the worth of long life. Bacon maintains that the continuance of life is a good; however, according to Zeno, Cicero's Cato, and Seneca's letters, the *summum bonum* nullifies the goodness of everything

else conventionally dubbed good.[66] True goods pertain to moral decision, everything else to fortune or vice. Long life falls among the indifferent things. Bacon, by contrast, explicitly approves Aristotle's "triplicity of good," goods of the soul, goods of the body, and external goods (II.20.5). In his view, the highest good of this world, public duty, does not render lower goods indifferent, much less evil. Instead, nature offers a multiplicity of goods, all of which earn their status by fulfilling and preserving in their various ways individual and human forms. Goods combine into a complicated theoretical scaffolding, wherein the highest does not nullify but retains the lowest.

With respect to prolonging life, Bacon's moral theory most closely resembles Aristotle's. Based on a triplicity of goods, Aristotle's ethics allows for material goods and pleasure even while it exalts moral and intellectual virtues. Happiness requires a life sufficiently long for the development of character and wisdom. Thus, for Aristotle, length of life is a necessary and preliminary good contributing to the highest good of happiness. Like Aristotle and the Peripatetic Cicero of *De Finibus*, Bacon rates the conservation of being a definite "good." The goodness of conservation is clear, according to Bacon, from pleasures attending the satisfaction of appetites that restore and preserve the body. Its goodness does not evaporate with the pursuit or attainment of more active and public goods but remains a necessary component of a plenary happiness. Nevertheless, as with Aristotle, its value and electability recede before more splendid choices.

The agreement with Aristotle proceeds only so far, however. The preeminence Bacon gives to public duty separates his analysis from Aristotle's no less than from Seneca's, but the most provocative point Bacon raises about conservative good may be that all philosophers, Aristotle included, have considered sensual pleasures more dangerous than they are and have too strictly enforced a certain kind of life. As evidence that human nature admits both tranquil and vigorous pleasure, Bacon observes:

> For can it be doubted but that there are some who take more pleasure in enjoying pleasures than some other, and yet nevertheless are less troubled with the loss or

[66] Cicero, *De Finibus*, III.41-54; and Seneca, Epistle 76.11-7. For Zeno, see Diogenes Laertius, *Lives of Eminent Philosophers*, vol. 2, trans. R.D. Hicks (Cambridge, MA: Harvard University Press, 1925), 208-213.

> leaving of them? So as this same, *non uti ut non appetas, non appetere ut non metuas, sunt animi pusilli et diffidentis*.

The concluding maxim reads, "Not to enjoy that you may not desire, not to desire that you may not fear, are the marks of a pusillanimous and diffident mind." Implicitly, Bacon endorses the converse of the motto: a bold and enterprising mind seeks and enjoys pleasures as marks of its magnanimity. It can do so, apparently, without loss of its courage and zeal. Hence his next point, that philosophers "are more fearful and cautionary than the nature of things requireth." In particular, Bacon targets their use of the fear of death:

> So have they increased the fear of death in offering to cure it. For when they would have a man's whole life to be but a discipline or preparation to die, they must needs make men think that it is a terrible enemy, against whom there is no end of preparing.

He posits a formidable argument. If a philosopher such as Seneca, who often does speak of death metaphorically as an enemy,[67] wishes to reduce affection for this life, constant reminders of death's imminence and ruinous costs subvert the message. The more terrible death seems, the more precious life seems. Secondly, ceaseless preparations for death leave no room for—and, in fact, intentionally forego—smaller pleasures, which are also a natural good. Bacon approves instead the middling attitude heard in lines from Juvenal's *Satire* X:

> Qui spatium vitae extremum inter munera ponat
> Naturae…[68]
>
> [Which places the length of life last among the gifts of nature.]

This is precisely where Bacon places longevity in *The Advancement of Learning*, a gift but "lowest" of all gifts.

The reason Bacon offers for why philosopher enjoin the preparation for death takes his criticism deeper: "so have they sought to make men's minds too uniform and harmonical, by not breaking them sufficiently to contrary motions: the reason whereof I suppose to be, because they

[67] Epistle 32.2-4, 49.6-10.

[68] Lines 358-9. The lines occur within the concluding prayer that Juvenal enjoins his readers to use: "You should pray for a sound mind in a sound body; ask for a stout heart that has no fear of death, and deems length of days the least of nature's gifts." Translation is by G.G Ramsay (Cambridge: Harvard UP, 1918).

themselves were men dedicated to a private, free, and unapplied course of life" (II.21.5). In other words, philosophers have rebuked pleasures and politics and solicited exclusively for the life of contemplation because they have known nothing else themselves. As Bacon sees it, there is something wrong with a mind "too uniform and harmonical" or unbroken by "contrary motions." Based on his preceding statements, his objection would seem to aim at the willful exclusion of natural goods. It is almost as though he believes that evil, or perhaps one form of evil, is not making the most of the goods that nature offers. (Another kind of evil, already suggested, would be the overthrow of a higher good by a lower.) Indeed, natural goods are manifold, and each contributes something to the fulfillment and preservation of the human form. Thus, those who insist on a uniformity of good or a uniformity of life neglect large parts of human happiness.

It is difficult to tell which philosophers Bacon has in mind—perhaps Seneca. The brunt of his reproach falls on a conventional notion reaching back at least as far as Aristotle that the kinds of lives available to humans number three, the public or political, the philosophical, and the pleasurable.[69] Aristotle writes that each life corresponds to a different good (moral virtue, intellectual virtue, or pleasure) and that each may accommodate something of the other goods. Nonetheless, he believes that one good predominates in life and directs it. Bacon does not necessarily disagree with these notions; his objection seems to be to more prohibitive permutations. But he does insist, more perhaps than does Aristotle in the *Nicomachean Ethics*, on the incorporation of pleasure. He exhorts readers to imitate the "wisdom" of jewelers who

> if there be a grain, or a cloud, or an ice, which may be ground forth without taking too much of the stone, they help it; but if it should lessen and abate the stone too much, they will not meddle with it: so ought men so to procure serenity as they destroy not magnanimity.

In the analogy, magnanimity takes precedence over serenity, or pleasure. Bacon continues to rate the active higher than the passive, yet he also brooks pleasure so long as it does not demean the superior good. The metaphor is a bit confusing; the jeweler grounds out a defect whereas a person procures

[69] *Nicomachean Ethics*, I.5 (1095b-1096a).

serenity. Still, it conveys Bacon's sense of the pliability of goods, which tolerate admixture without reduction of value. Implicitly, Bacon argues that, provided a person balances various goods wisely, all goods, even sensual pleasures, the lowest, can be sought without moral debasement, and should be sought for a complete, earthly happiness.

Despite some possibly greater concessions made to the kinds of pleasures attendant upon the conservation of being, Bacon's appraisal of long life as the *maximum bonum* conforms fairly well with Aristotelian ethics and is not quite as strange as it may first seem. For Bacon, the continuance of life is a good, a natural desire, and advantageous to the achievement of nobler qualities and actions—all ideas prevalent in the Renaissance. Yet it is by no means the object of living, however much his obsession with the prolongation of life may tempt the interpretation. Or, at least, Bacon never asserts that it is. Repeatedly, his statements subordinate the pleasures attendant upon the continuance of life to public duties and sociable deeds. His devotion to the prolongation of life, the lowest of goods, can be explained by its universal applicability to human lives (it is the most far-reaching of charities) and by its malleability to natural science.

All the same, there are a couple of sticking-points with Bacon's appraisal of long life as the *maximum bonum*. One of these is his professed acknowledgement that "perpetuity and certainty in our pleasures" would alter human will and appetite and thus the platform of goods. Earlier, I mentioned Bacon's prediction when reviewing his analysis of the active good, which, he says, "the consideration of our estate to be mortal and exposed to fortune" upholds. According to Bacon, the desire to have ourselves "somewhat secured and exempted from time" fuels the desire to perform deeds and works that perpetuate our image in fame. With fortune defanged and mortality deferred, pleasure would gain higher prominence, or, in Bacon's words, "the state of them would advance their price."

The trouble, of course, is that Bacon's instauration of the sciences portends human control over much that fortune now dominates and, above all, over mortality. His ambition to prolong life

threatens to alter the balance of goods, and Bacon knows it. His potential subversion of the highest of private goods, the active good, is self-conscious and self-willed, which means that Bacon may esteem the pleasures attendant upon the conservation of being more greatly than he lets on. The advanced price of such pleasures may have the benefit, as Bacon foresees it, of mitigating the rife perversions of the active good. As we should recall, he explains little of what constitutes the goodness of the active good, instead harping on ambitions and "advancement local" that basely substitute for it. Perhaps he views natural pleasures a favorable trade-off against the corruption "which possesseth the troublers of the world" (II.21.1). After all, the desire for fame itself substitutes for living perpetuity, and longer life would seem not to diminish and perhaps even brace the other pillar of the active good, the variety of "enterprises, pursuits, and purposes of life," which also yields "sensible…pleasure" through the "inceptions, progressions, recoils, reintegrations, approaches and attainings to their ends" (II.21.1).

We may wish to add among the explanations for Bacon's devotion to prolongation of life the potential improvement longer and more energetic lives may make to professional, nationalistic, and humanitarian endeavors, as some commentators have observed;[70] however, as just shown, Bacon's hope for such improvements must be balanced against his express belief that longer life can diminish the human appetite for the active good. Along with the expectation of improvements to human endeavors, for which Bacon's texts do give evidence, he perhaps hopes too that longevity will extend natural pleasures, which nevertheless trammel the will for the active good—but only the active good. For Bacon reserves public duty, which is higher than any private good, to the preservation of the human form, not the individual form. Thus, in his view at least, the perpetuation of individual life should not retard the will to public duty.

[70] See Gerald Gruman's Introduction to Louis Cornaro, *The Art of Living Long*, trans. William F. Butler (New York: Springer Publishing, 2005), esp. xxviii-xxxv. Also see See Guido Giglioni, "The Hidden Life of Matter: Techniques for Prolonging Life in the Writings of Francis Bacon" in *Francis Bacon and the Refiguring of Early Modern Thought*, ed. Julie Robin Solomon and Catherine Gimelli Martin (Burlington, VT: Ashgate, 2005), 129.

The second sticking-point, which this chapter has mostly avoided till now, is that the prolongation of life in the Baconian sense is not the same thing as the preservation or conservation of form or the continuation of life, the phrases that Bacon uses to define the lowest of goods in *The Advancement of Learning*. The prolongation of life as the increase of human lifespan necessarily includes the continuance of life, but the continuance of life does not necessarily include the increase of the human lifespan. A child, for instance, may continue to live by eating a meal and thereby experience the pleasures of "fruition" but has not come close to surpassing the upper limit of human life. By the same token, longevity is not the same as self-preservation, and the goodness of the latter does not necessarily entail the goodness of the former. Self-preservation occurs all through one's lifetime; however, longevity connotes a preceding accumulation of life larger than what, say, a child or adolescent can claim. How much is uncertain and variable. Nevertheless, longevity, for us as well as for early moderns, is prone to a different set of moral judgments; a teenager, for instance, who dies of sickness seems cheated in a way that a ninety-year-old does not.

Likewise, well before Thomas Hobbes grounded an entire system of political philosophy in the natural right to preserve oneself, early moderns maintained that self-preservation is a natural affection and a good of nature while at the same time defending the supposedly natural limits to human life. The scholar Henry Cuffe's book *The Difference of the Ages of Man's Life* (1607), for instance, supposes that humans and all other creatures possess natural tendencies to both preservation and destruction, and thus Cuffe approves nutrition as a natural means to continue life but condemns any desires and efforts to live beyond the natural term as foolish and impossible. Harkening Aquinas, Thomas Wright underscores the goodness and naturalness of a self-love that promotes the preservation of the individual, yet radical moisture theory entails a fixed period to human life.[71]

Here, Bacon's trouble is that his apologies of prolonging life in *The History of Life and Death* and *De Augmentis* and his argument about goodness of the conservation of being in *The Advancement*

[71] Henry Cuffe, *The Differences of the Ages of Man's Life* (London, 1607), esp. 3-5, 71-9; and Thomas Wright, *The Passions of the Mind in General* (London, 1604), 12-15, and *A Succinct Declaration of the Nature of Climacterical Years* (London, 1604), 5.

of Learning do not meet the objection that the pursuit of a longevity surpassing the so-called natural term is wrong. His response to this objection has been suggested nonetheless in Part Two of my dissertation as well as in an earlier section of this chapter: the limits set and the gifts offered by nature and hence by universal providence are not always obvious but often must be divulged by art. The occasions when Bacon applies this principle to the length of human life are few, and most only implicit; for instance, in *Valerius Terminus* he writes that art has the duty to search out all available good works, even human immortality "if possible," and in *The History of Life and Death* he uses the Old Testament to verify the possibility of stretching human life to centuries. The most explicit example occurs in "Prometheus, or the State of Man" in *De Sapientia Veterum*.

In Bacon's rendition of the myth, the human race snitches on Prometheus for having stolen heavenly fire for their sakes; however, "this act of theirs was not so taken as justice may seem to have required." Instead of punishing, Jupiter and the other gods reward the human race, bequeathing them "a new gift, of all others most agreeable and desirable,—perpetual youth." The humans, however, foolishly place their new gift on the back of an ass. While travelling home, the ass comes to a fountain guarded by a serpent. Parched with thirst, the ass trades the gift to the snake for a drink of water. "[A]nd so for a mouthful of water the power of renewing youth was transferred from men to serpents" (SEH VI.669, 745).

In his exposition, Bacon reads the surprising munificence of the gods as a sign that complaint is more pious and holy than complacency: "The meaning of the allegory is, that the accusation and arraignment by men both of their own nature and of art, proceeds from an excellent condition of the mind and issues in good; whereas the contrary is hated by the gods, and unlucky" (SEH VI.672, 748). Those persons who take nature and the arts as already perfect err twice, arrogating to themselves the perfection of divinity and declining to make their works more useful to mankind. Against expectations, those by contrast "who arraign and accuse nature and the arts, and abound with complaining, are not only more modest (if it be truly considered) in their sentiment, but are also stimulated perpetually to fresh industry and new discoveries" (SEH VI.672, 748-9). Bacon's

inversion of the normal comparison bears out his belief, as stated here, that "truth is drowned in very deep wells, that the true and false are strangely joined and twisted together…," a belief underpinning his maxim that nature can be controlled only by obeying her. As a symbol, the ass too indicts humanity. The ass represents "experience," according to Bacon, the plodding and haphazard method of distilling axioms from instances. To perfect the art of discovery, this empirical faculty wants its dogmatical counterpart, with which it has never been "well united and coupled." Bacon's instauration of learning promises the marriage of both (SEH V.673, 749-50). Finally, the gift on the back of the ass, "the unfading flower of youth," gauges the full potential of human arts. This gift is not only something that the gods approve, it is something within the reach of human ingenuity and effort:

> it seems to show that methods and medicines for the retardation of age and the prolongation of life were by the ancients not despaired of, but reckoned rather among those things which men once had and by sloth and negligence let slip, than among those which were wholly denied or never offered. For they seem to say that by the true use of fire, and by the just and vigorous accusation and conviction of the errors of art, such gifts might have been compassed; and that it was not the divine goodness that was wanting to them therein, but they were wanting to themselves; in that having received this gift of the gods, they committed the carriage of it to a lazy and slow-paced ass. (SEH V.672-3, 749)

Enduring youth and the prolongation of life stand as the examples *par excellence* of "new and augmented measures of divine bounty" attainable by a reformed method of discovery (SEH V.673, 750). God has hidden these bounties in nature for humankind to unearth through diligent application of mind and works. Prometheus symbolizes not only the state of man, as the subtitle declares, but also "Providence," as Bacon later says (SEH V.670, 746). The development of the arts begins with recognition of what the state of man is and proceeds with foresight of what God has arranged for the state of man to become.

Unlike *The Advancement of Learning* or Bacon's other apologies for the prolongation of life, his interpretation of the Prometheus myth justifies the prolongation of life as the alleviation of a widespread complaint. The complaint, like all complaints against nature, acknowledges an evil inherent to nature and therefore assumes that nature in its ordinary course is not an infallible

benefactor. Bacon's mythology strives to sanctify the attitude hidden behind complaints against nature. Instead of accepting such an attitude as prideful sin and thence re-adjusting one's disposition to something supposedly more pious, one should re-conceive nature and its goodness. The good of nature is not universal and immediately forthcoming but must be searched out. A valid art searches out nature's true good and participates in realizing it. A stagnant art takes nature as given and is defective but considers itself perfect. Thus, "if it be truly considered," someone who refuses the progress of the arts, the final step of which comprises the prolongation of life, runs into two other sins, sloth and pride. With complaint legitimated, however, redress becomes a good. It not only relieves a defect or evil of nature, its process fulfills the duties of labor imposed on mankind by God, one to discover the truth of nature through works and another to implement knowledge for charity. As Bacon affirms in *The Advancement of Learning*, the "true ends" of knowledge are "the glory of the Creator" and "the relief of man's estate" (I.5.11).

Because the prolongation of life is the *maximum bonum*, the complaint that it meets is the most pervasive and intense. It targets the human state of physical corruption and mortality. Complementarily, in *De Augmentis* Bacon calls "the desire of life" [*vitae desiderium*] the "greatest" [*maximum*] desire in an individual (SEH I.717, V.7).[72] In this case, the word "*maximum*" may signify either or both the extent of the desire across humanity and its intensity for each person. But as Bacon understands the complaint, it does not impugn death so much as the brevity of life and decline into old age. By taking its own state and that of art as unfulfilled, humankind can achieve perpetual youth, not simply more time, which one may attain also in a Tithonus-like condition of a prolonged fade. When other Renaissance commentators (Thomas Hobbes, for example) describe the natural desire for self-preservation, "self-preservation" seems to signify the perpetuation of bare existence. For Bacon, however, the natural desire for self-preservation rises to the desire to preserve the "fruition" of being, to preserve individual "form." Naturally, human beings desire not just to live, according to Bacon,

[72] The phrase appears amidst the previously cited story of Pompey the Great, who said, "*Necesse est ut eam, non ut vivam*." *The Advancement of Learning* of 1605 does not include the like.

but to live in their best state, which, in the normal courses of nature, eventually deteriorates and, prior to the completion of human learning, may not even be known. This is the desire that Bacon hopes the instauration of natural sciences will satisfy.

CHAPTER 9

SPENSER'S ASCENT TO AGE: THE *FOWRE HYMNES*

In Book IV of *The Faerie Queene*, Edmund Spenser's allegory of friendship, we hear how one of its titular heroes, Triamond, overcomes mortality. When his mother Agape begins to worry that he and his two brothers will meet early deaths as a result of their adventure-seeking—that, as Spenser writes, "their days mote be abridged through their corage stout" (ii.46)—she travels to the underworld to speak with the three Fates, "desirous th'end of all their dayes / To know, and them t'enlarge with long extent" (ii.47).[1] As in classical mythology, the Parchae spin, measure, and cut the threads of human lives. Reaching "the bottom of the deep Abysse" (ii.47), Agape is startled to find the threads of her three sons as thin and short as the gossamer of spiders' webs and quickly implores the Fates "to draw them longer out, and better twine, / That so their lives might be prolonged late" (ii.50-51). After the Fates reprove her ignorance (their decrees cannot be undone, even by Jove), she offers a compromise, which, in the terms of human negotiation, the Fates really have no cause to accept, Agape having no chip to bargain. Nonetheless they oblige her. Their acquiescence testifies to the power of divine love over nature. Instead of prolonging any one of her sons' threads, they combine the lives of all her sons into one so that when the brother with the shortest thread, Priamond, dies, his life passes into the next, Diamond, and his, in turn, into the next, Triamond (ii.52).

This strange metempsychosis becomes important to the allegory, for when Triamond engages Cambell in combat to win the hand of Cambell's sister Canacee, it is what enables him to be killed twice yet not die. Partly, therefore, it is what enables Triamond and Cambell to unite in fast friendship. Cambell also has a means of revival housed in a magic ring that repairs all wounds. Each

[1] My text is *The Faerie Queene*, ed. Thomas P. Roche (New York: Penguin, 1978).

knight surviving a protracted fight that neither could endure without supernatural help, the men are at stalemate when ministered by Cambina, Cambell's sister. The Homeric Nepenthe that she applies washes away their gall and enmity and infuses new, kindlier affections, thereby bonding the former enemies into friendship.

The possible significations of the allegory are manifold. As Spenser writes at the start of the next canto, the allegory illustrates, in part, the mutability of human relationships. As "it often fals," foes become friends, and friends become foes. Additionally, according to Spenser, friendships built upon the advantages of occasions do not last; the more constant ones have as their basis "regard of good" (iv.1). Implicitly, Cambell and Triamond enjoy such a friendship after Cambina plies them with Nepenthe. Moreover, the quaternion of the two friends and their wives plus the triplex of brothers enable Spenser to suggest amatory principles that the rest of the book will develop. The tetrad evokes the Plato's double-mean (*Timaeus* 32b-c) and extends the allegory to the metaphysical friendship uniting the four elements and sustaining the cosmos.[2] Meanwhile, the trinity of brothers alludes to the tripartite soul of Aristotle and Scholastic doctrine (natural, sensitive, intellectual) and hence to the three kinds of love associated with them, love of kin, love of woman, and love of friends.[3]

Agape poses a different interpretive problem. Her name associates or identifies her with Christian love, translated as *caritas* and charity. In a passage from Colossians that Patrick Cheney quotes in relation to Spenser's allegory, St. Paul defines *agape* as "the bond of perfectness."[4] As Cheney observes, charity was thought to have three forms, the love of God and Christ for man, man's love for God and Christ, and the love of man for his fellow men. Despite Christian resonances, however, there is something oddly foreboding or even evil about Agape's mission to prolong the lives

[2] James Nohrnberg, "*The Faerie Queene*, Book IV," in *The Spenser Encyclopedia*, ed. A.C. Hamilton (Toronto: University of Toronto Press, 1990), 273-280.

[3] Patrick Cheney, "Triamond," in *The Spenser Encyclopedia*, ed. A.C. Hamilton (Toronto: University of Toronto Press, 1990), 698-699.

[4] Ibid., 698.

of her children. Spenser impresses upon readers a sense of its danger and sin with his description of the Fates' home. It is hellish. Located at "the bottome of the deepe Abysse," its other occupants include the "dark" and "hideous" characters Demagorgon and Chaos. Most terrible for an epic in which geography so often reflects moral and religious values, it lies "farre from the view of Gods and heavens bliss" (ii.47). Readers of the previous books probably would recall another, decidedly sinister venture into the underworld taken for similar reason, the descent of Duessa with her mother Night, who in Book I seek the aid of Aesculapius to revive the dead Sansjoy. As Darryl Gless has argued, Duessa's mission infernally parodies voluntarist theories of salvation, which teach that we can achieve heavenly bliss through good works and which fail to see that salvation depends exclusively on grace.[5] But the episode also parodies more generally the vehemence with which those who live for that which Duessa symbolizes, the sensual vices of the world, desire to continue their life on earth, forgetful of the greater bliss of heaven. Correspondingly, the threads issuing from the looms of the Fates are, despite Agape's desire to lengthen those of her sons, "vaine" (ii.48).

The hints that Agape's errand is nefarious coalesce in the next canto into a bald statement:

O why doe wretched men so much desire,
To draw their dayes vnto the vtmost date,
And doe not rather wish them soone expire,
Knowing the miserie of their estate,
And thousand perills which them still awate,
Tossing them like a boate amid the mayne,
That euery houre they knocke at deathes gate?
And he that happie seemes and least in payne,
Yet is as nigh his end, as he that most doth playne.

Therefore this Fay I hold but fond and vaine,
The which in seeking for her children three
Long life, thereby did more prolong their paine.
Yet whilest they liued none did euer see
More happie creatures, then they seem'd to bee,
Nor more ennobled for their courtesie,
That made them dearely lou'd of each degree;
Ne more renowned for their cheualrie,
That made them dreaded much of all men farre and nie. (iii.1-2)

[5] Darryl Gless, *Interpretation and Theology in Spenser* (Cambridge: Cambridge University Press, 1994), 102-104.

The stanzas communicate much the same view of earthly life as John Calvin's pronouncement that "this life, estimated in itself, is restless, troubled, in numberless ways wretched, and plainly in no respect happy."[6] Life is misery, and prolonging it is simply to prolong pain. Tellingly, when the second stanza shifts to the happiness of the three brothers, it also alters perspective from that of the narrator to that of third-party observes within the story, to what other persons saw and what "seem'd." The three brothers do a better job than most at seeming happy—their courtesy and chivalry win them honors, fame, and universal respect—but their happiness may, from a different perspective, be illusory.

Why would Spenser have Agape, the namesake of Christian love, do something that he judges fond and vain? This question may yield several answers, but I believe that the infernal journey of Agape illustrates something that also underpins the *Fowre Hymnes*, the focus of the present chapter. What it illustrates is the rectification of nature by divine grace.

Back in Book I, readers saw a justifying grace mingle with nature when Redcrosse Knight confronted the figure Despayr. Now, the opening stanzas of IV.iii echo lines spoken by Despayr:

> The lenger life, I wote the greater sin. (I.ix.43)

> For what hath life, that may it loued make,
> And giues not rather cause it to forsake?
> Feare, sicknesse, age, losse, labour, sorrow, strife,
> Paine, hunger, cold, that makes the hart to quake;
> And euer fickle fortune rageth rife,
> All which, and thousands mo do make a loathsome life. (I.ix.44)

> Why then doest thou, o man of sin, desire
> To draw thy dayes forth to their last degree?
> Is not the measure of thy sinfull hire
> High heaped vp with huge iniquitie,
> Against the day of wrath, to burden thee? (I.ix.46)

[6]John Calvin, *Institutes of the Christian Religion*, trans. Henry Beveridge (Grand Rapids, MI: William B. Eerdmans, 1989), III.9.1.

Despayr, of course, unfurls these arguments to prod Redcrosse Knight into committing suicide. When narrating the opening of IV.iii, Spenser does not affirm them. Rather, his reiteration of some of the same points underscores the perverse use to which Despayr puts them and the distortion wrought when valuations true enough in themselves are removed from a complex of restricting beliefs. Primarily, Despayr neglects the inordinate power of divine grace, signified by Una, who ends up saving Redcrosse Knight from suicide. Ignoring unmerited grace, Despayr is able to twist a Calvinist depiction of the world into grounds for self-inflicted death, something Calvin and most all Christian theologians from Augustine forward condemn. Una's intervention exposes the futility of trying to conform salvation to reason, which cannot account for the metaphysical orchestrator of the world.

In the case of Agape, the sense of wickedness attaches to an impulse opposite to that which Redcrosse Knight nearly yields, perhaps the most natural desire in human beings, that for survival. Spenser first draws attention to this desire when Duessa ventures to the underworld, an episode left unconcluded, with Aesculapius applying his restorative medicines and charms. The desire next emerges in the following scene of the same canto when Redcrosse Knight's dwarf, often interpreted here as the native sense of self-preservation, persuades him to escape the House of Pride. The juxtaposition highlights the justifying grace secretly suborning Redcrosse Knight's native sense of self-preservation, something that the forsaken Duessa and Sansjoy lack.[7]

Spenser never returns readers to the operating-table of Aesculapius; however, the episode has its thematic and symbolic sequel in Agape's descent. Agape initiates a process of consecration whereby earthly survival is redeemed from the voluptuous life of the flesh and fitted to divine purpose. The speaker-poet's disparagement of her as "fond and vaine" borrows the language of *memento mori* texts to remind readers that, seen from the vault of heaven, the world is a place in which to die, not to live, but by targeting Agape's desire simply to extend her sons' lives, it also

[7] Possibly, with the difference between the fortunes of Duessa and Redcrosse Knight Spenser also limns the Thomistic dichotomy of despair-by-lust and despair-by-sloth. (See *Summa Theologica* Pt. II-II, Q. 20.) The former obscures spiritual goods with the bodily pleasures, whereas the latter perceives spiritual goods but imagines them impossible to obtain. The first would seem to result in the more destitute case, someone willfully ignorant or forgetful of even the existence or worth of spiritual goods. I do not know whether or not reformist theologians tended to retain this distinction.

allows for a different assessment of living *for* something. Indeed, the names of the titular heroes separately enfold the mutability of the earth and the *telos* of heaven. Slowly, divine love works strange alchemy upon nature, converting by steps the filial love implanted by nature into a self-sacrificing love of good.

Although charity begins with the effort to secure the life of another, the love between friends does not reach fulfillment until one desires for a friend more than what is necessary, but what is good, even if it may cost one his life. In the case of Cambell and Triamond Spenser represents this fruition of friendship in canto iv when they fight in each other's armor against Satyrane, each risking his own life but prepared to give glory to the friend. Before then, however, Spenser already has illustrated the importance to the development of true friendship of self-abnegation, particularly the lack of concern for one's own existence. At their first meeting, the miraculous amity forged between Cambell and Triamond follows their long, exhausting, deadlocked battle when "So wearie both of fighting had their fill, / That life it selfe seemed loathsome, and long safetie ill" (IV.iii.36).

Although festooned with classical references and sparing of biblical, the allegory seems to affirm the Christian inversion of life and death. Mortification is needed as much for the charity one is to feel towards one's fellow men as it is for the private virtue of temperance. When Cambina appears bearing her arts and charms acquired from her mother—another maternal Fay who, like Agape, is a magus—she hurls Cambell and Triamond into a deathlike trance before she revives them into true friendship (IV.iii.48). Her magic spells signify the supernatural element at the core of perfect friendship, which mysteriously kills the natural desire for survival by transforming it. Suddenly, living for the sake of another to the neglect of oneself becomes a heightened and satisfactory form of self-preservation. With a subtle echo, Spenser sets Cambina's successful magic in opposition to Aesculapius's failed medicine of Book I. She enters bearing a "rod of peace" with two serpents twined around it, an addition to the rod of Aesculapius, which features only one serpent. More closely her rod resembles the Caduceus of Hermes Psychopompos ("Maias sonne"), which alone has the power to lead souls into and out of the underworld (IV.iii.42). Christ, who in the earlier story of

Aesculapius comes to the minds of readers through obvious omission ("Physician, heal thyself"), infiltrates the story of Cambell and Triamond under the guise of a pagan emblem. He is the true Mercury.

The story of Cambell and Triamond reminds Christian readers that life is but lent and that, as such, the glory of this life consists not in extending the lease but in using it to the purpose that God intended. By this rule, longer life befits a Christian as an extension on the opportunity to enact charity. St. Paul offers a model of the resulting ambivalence that a Christian should take toward earthly life:

> For to me to live is Christ, and to die is gain. But if I live in the flesh, this is the fruit of my labour: yet what I shall choose I wot not. For I am in a strait betwixt two, having a desire to depart, and to be with Christ; which is far better. Nevertheless to abide in the flesh is more needful for you. And having this confidence, I know that I shall abide and continue with you all for your furtherance and joy of faith; That your rejoicing may be more abundant in Jesus Christ for me by my coming to you again. (Philippians 1:21-26)

Charity, however, may involve the love of man toward God as well—not only the love toward fellow man to which Paul refers, which is the same, narrower sense of the word that Francis Bacon uses in the opening pages of *The History of Life and Death*, discussed in the previous chapter.

While the story of Cambell and Triamond, and indeed most of the stories of Book IV of *The Faerie Queene*, lay more emphasis on social charity, the *Fowre Hymnes* moves between that and the loves directed toward and extended from God and Christ. Like the allegory of friendship, it features multiple kinds of love, which it arranges in progression—or in what looks like progression, anyway. Switching to heavenly loves, however, it confronts another facet of earthly longevity, which is the old age to which longevity inevitably leads. The allegory of friendship touches upon a particular issue that old age raises. The *Fowre Hymnes*, however, expands upon it. In the allegory of friendship, the passage I have in mind concerns Cambina's memory-erasing drug:

> Nepenthe is a drinck of souerayne grace,
> Deuized by the Gods, for to asswage
> Harts grief, and bitter gall away to chace,
> Which stirs vp anguish and contentious rage:
> In stead thereof sweet peace and quiet age
> It doth establish in the troubled mynd.

Few men, but such as sober are and sage,
Are by the Gods to drinck thereof assynd;
But such as drinck, eternall happinesse do fynd. (IV.iii.43)

To the "anguish and contentious rage" stirred by grief and gall, nepenthe opposes "peace" and—what is more unexpected—"quiet age." Age is not necessarily an affect of the soul, much less an affect opposite to rage; ignoring the rhyme of the stanza, one might think instead of other synonyms for peace, such as calm or tranquility, or affections closer to friendship, such as benevolence, amity, or even love. In the midst of describing a transcendent, spiritual renewal, Spenser suggests that this seemingly supernatural change reproduces the very natural process of growing older. Age brings with it the peace of mind that nepenthe suffuses. The comparison deepens when we realize that for early moderns, as for us, the loss of memory was a widely recognized effect of senescence.

The *Fowre Hymnes* evinces a similar alignment between nature and divine grace, which merge at old age. Although Francis Bacon assumes that the prevention and reversal of senescence is undeniably an act of charity, the *Fowre Hymnes* illustrates that for early modern Christians the loss of youthful vigor after maturity could occupy a much more ambiguous status and, in some cases, may even manifest the work of grace. The remainder of this chapter discusses how it does this.

* * *

Anyone reading Spenser's *Fowre Hymnes* eventually must confront the question how to interpret the white space between the "earthly" and "heavenly" pairs.[8] In the Dedicatory Epistle, dated 1596, and the exordium of "An Hymne of Heavenly Love," the third hymn, Spenser appears to reject the earthly love and beauty praised by the first two hymns ("An Hymne in Honour of Love" and "An Hymne in Honur of Beautie"), which he wrote in his "youth." The four poems form a diptych. The question is how the two panels of hymns relate to one another. Is there a steady and

[8] The text of the *Fowre Hymnes* that I have used appears in Edmund Spenser, *The Shorter Poems*, ed. Richard A. McCabe (New York: Penguin, 1999), 451-489.

continuous progress from the love for physical beauty to the love for divine Sapience celebrated in the final hymn ("An Hymn of Heavenly Beautie"), or is there a break followed by a new beginning when one switches from the earthly to the heavenly? Maybe Spenser seriously wants readers to reject and ignore "lewd" love like that celebrated by the first two hymns. But if so, why, as Thomas Roche has pointed out, include the first pair of hymns and publish them with the second?[9] Or why commend the Countesses of Cumberland and Warwick, the dedicatees, as paragons of "both kinds" of love and beauty?

Recently, Patrick Cheney has surveyed the various responses to these questions by critics from J.B. Fletcher onward and grouped them into three types—progressive, dialectical, and typological—to which he has added a fourth, careeric.[10] Although my immediate aim is not to defend one or another of these views, much less add a fifth, I suppose that my analysis here nonetheless confirms or, maybe more accurately, assumes one of them, and that is the dialectical theory, which places emphasis on the contrast between the two panels of hymns while asserting the overall unity of the four. The critics who have read the earthly and heavenly pairs dialectically have tended to pause over the Dedicatory Epistle and the exordium of the third hymn, as I do below, and have stressed the distinct shift in modalities as Spenser veers from Neoplatonic language, images, and ideas in the earthly hymns to scriptural references and revelatory faith in the heavenly. Like most dialectical theorists, I suppose that I would doubt any "progressive" reading of the *Fowre Hymnes* that conceives it as perpetuating a neat Neoplatonic schema according to which the mind's ascent from sensible to intellectual beauty is available to anyone naturally gifted and liberally educated, regardless of Christian faith.

My interest, however, is in the play between concepts that in large part, I think, contributes to the perplexity and self-contradictions apparent in the "macrotext" of the *Fowre Hymnes*.[11] In the last

[9] Quoted by Mary I. Oates, "Spenser's *Fowre Hymnes*: Spenser's Retractations of Paradise," *Spenser Studies* 4 (1984): 145.

[10] Patrick Cheney, *Spenser's Famous Flight* (Toronto: University of Toronto Press, 1993), 197-198 and 285-286.

[11] Elizabeth Bieman, *Plato Baptized* (Toronto: Toronto University Press, 1988), 153.

few decades, historians and literary scholars have drawn attention to the inconsistencies and confusions in the intellectual legacies that Renaissance writers inherited. William Bouwsma, for instance, has identified two divergent tendencies in Renaissance humanism, which he has called "Stoicism" and "Augustinianism." In part, these two "faces" of humanism conflict over how effectively reason can control the passions and bodily desires, the Stoic legacy confident of its success, the Augustinian legacy certain of its failure.[12] Similarly, according to Debora Shuger, much Christian theology, especially reform theology, insists upon the "profoundly unclassical" notion that the vulnerability of the flesh is an essential constituent of humanity.[13] Such varied and discordant intellectual inheritance is often responsible, according to Michael Schoenfeldt, for the incongruent statements that Renaissance authors, sometimes the same Renaissance author, makes about corporeal determinism and self-control.[14]

Contradiction need not indicate senseless mistakes of logic, however, as these scholars also point out. Sometimes, incommensurable ideas may be used to approach subjects that are themselves dark and mystifying. The *Fowre Hymnes* discloses such a troubled mingling of intellectual legacies related to the soul's education. The perplexities into which the text tantalizingly sinks its readers arise, I think, largely because it remains defiantly uncertain about how divine grace works through the body, which acts sometimes as an aid, sometimes as a hindrance to the will.

The importance of the body figures into the *Fowre Hymnes* through its language of aging, something often noted but little explained by critics. This language proliferates especially in the Dedicatory Epistle and the exordium of Hymn 3 when Spenser glances back upon the feckless love poetry of his past. The contrast between his youth and age has prompted Thomas Hyde to interpret

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[12] William Bouwsma, *A Usable Past* (Berkeley: University of California Press, 1990), 19-73.

[13] Debora K. Shuger, "Subversive Fathers and Suffering Subjects: Shakespeare and Christianity," in *Religion, Literature, and Politics in Post-Reformation England, 1540-1688*, ed. Richard Strier and Donna Hamilton (Cambridge: Cambridge University Press, 1996), 50.

[14] Michael C. Schoenfeldt, *Bodies and Selves in Early Modern England* (Cambridge: Cambridge University Press, 1999), 11-12, 18-21, 176.

Spenser as accommodating "the hierarchy of his hymns to the succession of youth and age," a reading possibly corroborated by numerous Neoplatonic poems and commentaries proposed as influences on the *Fowre Hymnes*—Benvieni's *Canzona* with Pico della Mirandola's commentary, Castiglione's *Il Cortegiano*, Pietro Bembo's *Gli Asolani*, Leone Ebreo's *Dialoghi d'Amore*, and Louis Le Roy's *Le Sympose*.[15] Traveling up a Neoplatonic scale of love, one may not reach the highest form and ultimate source of beauty until well after maturity, if at all. As Robert Ellrodt has pointed out more recently while invoking Hyde's claim, however, Spenser never urges his readers to postpone the pursuit of heavenly wisdom till old age. Although the gospels stress the inversion of first and last, it was hardly considered charity to advise others to wait to the end of life before accepting spiritual comforts.[16]

We might wonder, then, why the language of aging abounds in the very passages in which Spenser opposes the two pairs of hymns. As I see it, the language of aging has three effects. First, it helps Spenser define and contrast two conceptions of human perfection that J.A. Burrow has termed ideals of nature and ideals of transcendence. Second, it intensifies the drama of the hymns, for the drama pivots on those ideals. Last, it renders the means of accommodating heavenly wisdom to human nature more obscure, not less.

To understand those effects, first we must examine how the dedicatory epistle and the exordium of Hymn 3 define youth and, by implication, maturity:

> Having in the greener times of my youth, composed these former two Hymnes in the praise of Loue and beautie, and finding that the same too much pleased those of like age & disposition, which being too vehemently caried with that kind of affection, do rather sucke out pyson to their strong passion, than hony to their honest delight, I was moued by the one of you two most excellent Ladies, to call in the same. But being vnable so to doe, by reason that many copies thereof were formerly scattered abroad, I resolued at least to amend, and by way of retractation to reforme them, making in stead of those two Hymnes of earthly or naturall loue

[15] Thomas Hyde, *The Poetic Theology of Love: Cupid in Renaissance Literature* (Newark, DE: University of Delaware Press, 1986), 139.

[16] Robert Ellrodt, "Fundamental Modes of Thought, Imagination, and Sensibility in the Poetry of Edmund Spenser," *Spenser Studies* 20 (2005): 18.

and beautie, two others of heauenly and celestiall. The which I doe dedicate ioyntly vnto you two honorable sisters, as to the most excellent and rare ornaments of all true loue and beautie, both in the one and the other kinde, humbly beseeching you to vouchsafe the patronage of them, and to accept this my humble seruice, in lieu of the great graces and honourable fauours which ye dayly shew vnto me, vntill such time as I may by better meanes yeeld you some more notable testimonie of my thankfull mind and dutifull deuotion. (Dedicatory Epistle)

* * *

Many lewd layes (ah woe is me the more)
In praise of that mad fit, which fooles call loue,
I have in th'heat of youth made heretofore,
That in light wits did loose affection moue.
But all those follies now I do reproue,
And turned haue the tenor of my string,
The heauenly prayses of true loue to sing.

And ye that wont with greedy vaine desire
To reade my fault, and wondring at my flame,
To warme your selues at my wide sparkling fire,
Sith now that heat is quenched, quench my blame,
And in her ashes shrowd my dying shame:
For who my passed follies now pursewes,
Beginnes his owne, and my old fault renewes. (H3 8-21)

In these two passages, as is often the case, youth signifies two different things, an "age," or a mere chronological index, and a "disposition" (ED 3). As a numerical age, it helps distinguish the date when Spenser composed the initial pair of hymns from the date of the heavenly hymns and the dedicatory epistle. The exordium reinforces that sense of distance with temporal cues such as "heretofore" (10), "passed" (20), "old" (21), "renewes" (21), three occurrences of "now" (12, 18, 20), as well as four tense changes and the evocative juxtaposition "quenched, quench" (20). In the dedicatory epistle, the disposition of youth is conveyed with the word "greener" (1). According to Hymn 2, youth breeds strong "vitall spirits" (102), for it lies closer to birth. Over time those spirits have dispersed, but in youth, they influenced Spenser as much as his peers who read his hymns. All were "vehemently caried" by an earthly love (4). Likewise, in the exordium of Hymn 3, Spenser refers to this love as a "mad fit" and the youths, including himself, who mistook it for true love as

"fools" (9). There, too, Spenser defines the passions of his younger self through an array of images linked to heat and fire: "heat of youth" (10), "my flame" (16), "warme your selves" (17), "my wide sparkling fire" (17), "heat is quenched" (18), and "in her ashes" (19).

To limn the disposition of youth, Spenser relies upon Galenic-Arabic physiology, according to which warmth, in addition to growth, distinguishes youth as a period of life and makes young men and women unusually susceptible to passions of love and anger. As this physiology maintains, the warmth results from the natural abundance early in life of the sanguine humor, which is also wet in quality. The depletion of the sanguine humor and the subsequent increase of dry and cold humors mark the passage of the body out of its youth and registers at the level of secondary humors deeper changes effected at the level of the radical. The surge of blood and vital spirits in youth bends the will toward lechery, rioting, and foolishness. "By meanes of the heate and abundaunce of bloude," the physician Levinus Lemnius writes, youths become "prone and prompte to pursue the inticements of all sensuall lustes and unbrydled affections, reputing the chieftest felicitye to consist in pleasure."[17] Hot humors produce hot passions, as humors fill the heart, the seat of the passions.

Furthermore, "simplicity and foolishnes proceedeth of the Bloud," a commonplace belief based upon blood's moistness.[18] Since Heraclitus and the pseudo-Aristotelian *Problems*, it was believed that intelligence proceeded from dryness whereas moisture dampened the intellect's light. The vital spirits of which Spenser speaks further impel this distraction from reason, for according to the standard physiology this brand of medical spirit, generated in the heart, is the most communicative with the passions, which are tied to the body's senses and movements, the offices of the vital spirits. Effervescences thrown off by blood, the vital spirits constitute another kind of internal heat familiar to youth and another source of moistness (vapor) beclouding the rational faculties.

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[17] Levinus Lemnius, *The Touchstone of Complexions*, trans. Thomas Newton (London, 1576), 101 v.

[18] Ibid., 96 r - v.

Over the question to what numeric ages the disposition of youth corresponds, Renaissance writers do not always agree; in fact, they differ widely about the number, names, and order of the stages of life all down the line. In 1596, when Spenser published the *Fowre Hymnes*, he was around forty-four years of age. A conventional and somewhat casual definition during the Renaissance placed the end of youth at forty.[19] Most schemes of the ages of man fit it either there or somewhere nearby. The influential scheme designed by Isidore of Seville sets it at fifty, whereas Lemnius puts it at thirty-five.[20] After youth there may follow any number of periods—"age," "man's estate," "full ripeness," "*status*," "virility," or even "old age." Jean Fernel, who marks the end of youth at forty, names the next period "steady and mature." In *The Castel of Helth*, Thomas Elyot, who also bounds youth at forty, follows it up with "*senectus*."[21]

Despite variations in Renaissance schemes of ages, we should not think them wholly arbitrary. Often, their authors designed them to demarcate inexorable mutations of the body, which they thought such schemes did reasonably well so long as they were viewed as the broadest kinds of rules allowing for exceptions such as individual temperament, geographic location, and habits of work and diet. Such schemes charted the order of changes more reliably than duration, as Fernel admits, the latter having more to do with individual temperaments and behaviors, and their authors often profess the ability of temperate persons to shape their destinies for good or ill, the good usually being the prolongation of ripeness, and ill, the acceleration and magnification of senescence. Nevertheless, while enforcing an ethic of self-control, they also insist upon flesh's indomitableness. Fernel defines age in the periodic sense as a "stage of life at which the bodily constitution alters of its own accord…a change that befalls just the temperament and original constitutional cause of all

[19] Creighton Gilbert, "When Did a Man in the Renaissance Grow Old?" *Studies in the Renaissance* 14 (1967): 7-32.

[20] Isidore of Seville, *The Medical Writings*, trans. William D. Sharpe (Philadelphia: The American Philosophical Society, 1964), 49; and Lemnius, 29 v.

[21] *The* Physiologia *of Jean Fernel (1567)*, trans. John M. Forrester (Philadelphia: American Philosophical Society, 2003), 248-251; and Thomas Elyot, *The Castel of Helthe* (London, 1541), 10 v.

functions."[22] Allowing exceptions, his five different stages—adolescence, youth, steady and mature, old age, and decrepitude—are meant to account for these involuntary changes of temperament and function. Relying on a metaphor lifted from Cicero's apology for old age, Lemnius introduces his eight-part scheme with a less technical explanation of ordinary changes:

> For as yeares do passe and mans age doth march forward, there still happen chaunges and mutacions. For age is no other thing but the race or course of life, or the time that wee haue to runne from oure Infancie till wee come to olde age, in which time, the state and constitution of mans Bodye is altered, and steppeth from one temperamente to an other, and at lengthe (natiue heate beinge extincte) by death is diuorced and broughte to finall dissolution.[23]

The race-course metaphor divides life into segments. Although Lemnius repeatedly insists upon the transformative effect that habits and choices can have on the rate and extent of the body's alterations, he, like Fernel, believes that all these stages "must" be run.

In this necessary sequence of ages or alterations in the body's temperament and functions, youth denominates a stage of life when hot affections linked to the abundance of blood often rebel against the rule of reason. Conversely, maturity, a stage subsequent to youth, defines a state of the body wherein the blood dries and affections consequently become more stable. Lemnius describes the period of such "ripeness" as when a man "leaving former pleasures and delightes, his mynde aduysedlye, carefullye, and wysely dealeth in euery thinge that he enterpryseth."[24] Given the flexibility of terms, old age may be synonymous with this period of maturity, or it may succeed it. Furthermore, old age may advance the blood's desiccation, assisting the operations of wisdom as a kind of naturally induced and moderate melancholy, or it may, in certain persons, promote new passions in accord with coldness and wetness of older humors. Fear and avarice were the two passions most commonly ascribed to the elderly.

In Spenser's case, however, what has quenched youth's fire is not said, at least not by the exordium of the third hymn. The language of age prevalent there and in the Dedicatory Epistle,

[22] Fernel, *Physiologia*, 247.

[23] Lemnius, 29 r - 30 r.

[24] Lemnius, 30 r.

however, invites readers to ask the question and search for its answer. Spenser solicits one response through the earthly hymns but overturns it with the heavenly hymns. The response solicited is, of course, reason. When readers familiar with the tradition of Neoplatonism arrive at the exordium of Hymn 3 likely they would assume that what has quenched the poet's heat is a matured rational faculty, one turned away from earthly beauties toward the abstract form Beauty seen in pure contemplation. They then would expect the two heavenly hymns to trace the remaining legs of his journey, following him to the destination to which the earthly hymns point.

We have a clear example of age's significance to Neoplatonic scale-climbing in *Il Cortegiano*, which makes the age of the wise lover the decisive point. The character Pietro Bembo introduces his Platonic ladder because he seeks to prove to his doubtful auditors that an elder courtier can love without shame and embarrassment. Perhaps Castiglione pays deference to the historical Bembo, whose own *Gli Asolani* condemns sensual love among the old.[25] Anyway, by the end of the fourth evening, Lord Gaspar has noticed a problem with the model courtier whom he and the other nobles have fashioned in speech, namely, that while a wise counselor "must in manner of necessitie be aged, for knowleage commeth verye syldome times before beefore yeeres, and speciallye in matters that bee learned with experience," nevertheless "Love frameth not with olde men." Gaspar acknowledges and re-affirms the traditional prejudice against the *senex amans*, whose indecorous continuation of the youthful sports of love attracts the scorn of those around him, especially women: "the trickes that in yonge men be galauntnesse, courtesie and precisenesse so acceptable to women, to them are mere folies and fondnesse to be laughed at, and purchase him that useth them hatred of women and mockes of others."[26]

Bembo, who is thirty-seven-years old at the time in which the dialogue is set and not yet accounted "old" by those around him, counters with an explanation whereby the old courtier may

[25] See Book III.

[26] Baldassare Castiglione, *The Book of the Courtier*, trans. Thomas Hoby and ed. Victoria Cox (London: J.M. Dent, 1994), 339.

submit to love without slander, without, furthermore, the grief and deceits that plague younger lovers, but with, surprisingly, positively more happiness than sensual lovers enjoy. His explanation relies on the Platonic definition used by Spenser throughout the *Fowre Hymnes* of love as a coveting of beauty and also relies upon the conception of the soul partitioned into "sense, reason, and understanding," the first beastly, the second human, and the last angelic.[27] Each faculty recognizes a different kind of beauty and therefore experiences a different kind of love. On the premise that the soul derives successively greater happiness from the satisfaction of successively higher loves, Bembo argues that the old courtier who has passed beyond the coveting of bodies whom his senses can observe and beyond the abstracted, almost geometric beauty that his reason can conceive will achieve the greatest happiness possible on earth when he reaches the "great universall beautye," which he discovers with angelic intellect, disconnected from sense.[28] Thus, the old courtier can love without mockery, for his love has no longer anything to do with a particular woman or even with women in general. Instead, he admires "heavenly beawtie," the luminous spark of all beauties, which Bembo nearly equates with God as "this most holye light, that showeth us the waye which leadeth to heaven."[29]

Granted, Spenser's two earthly hymns do not depict an ascent as smooth as that mapped by Bembo or by other Neoplatonists such as Ficino or Pico, for unlike those thinkers Spenser dramatizes the journey from the perspective of a man in the midst of the journey. The man struggles, slides back, and never ascends very high. The problem he has advancing up the scale, he says, is the affection love itself. Its heat keeps waylaying him: he can find no relief from the "force of this new flame" (H1 8), from its "wontlesse fury" (H2 2) and "raging fyre" (H2 4). So he tries to propitiate Cupid and Venus—and in turn his mistress—with hymns, hoping that his praise will earn him some "drop of dew relief" (H2 284).

[27] Ibid., 341.

[28] Ibid., 358.

[29] Ibid., 358-359.

For readers who bring with them a Neoplatonic perspective, the repetition of physical metaphors and corporal passions like heat, fire, pain, and grief betoken the distance that lies ahead of the poet. Other images, though, offer such readers grounds to hope that he will continue the journey. He keenly imagines the harmony of a love that binds two souls and prefers it over the base lust of bodies, and he understands that every earthbound beauty reflects its own celestial origin:

> For hauing yet in his deducted spright,
> Some sparks remaining of that heauenly fyre,
> He is enlumined with that goodly light,
> Vnto like goodly semblant to aspyre:
> Therefore in choice of loue, he doth desyre
> That seemes on earth most heauenly, to embrace,
> That same is Beautie, borne of heauenly race. (H1 106-112)

Setting proper Neoplatonic doctrine against grief-stricken complaint and furious longing, the earthly hymns dramatize love's growth as an imperfectly balanced and disrupted process. Disruptions arise necessarily, it would seem, given that through this process one strives to refine out of love the very thing that makes it palpable at its early stages, its heat. Somehow one must train and discipline love while still nurturing it—a difficult task if one seeks to avoid its mad fits.

Readers influenced by Castiglione may see in Spenser's earthly hymns and perhaps in the whole quartet what literary historian J.A. Burrow calls an "ideal of nature."[30] Ideals of nature, like their counterpart ideals of transcendence, represent a way of interpreting the *cursus aetatis*. According to ideals of nature, human perfection adheres to a rule of *tempestivitas*, or seasonableness: actions and ways gain luster or are deemed good at certain times of life whereas they lose luster or are deemed evil at other times. Book IV of Dante's *Il Convivio* provides a *locus classicus* for ideals of nature. A summary given by him formulates such ideals conveniently:

> Our nature, when it is good and upright, develops in us by following a fitting sequence (just as we observe the nature of plants developing in them), and so different customs and different kinds of behaviour are fitting at one stage which are not so at another. In these the ennobled soul develops in an ordered way guided by a single criterion: it brings its activities into play at the times and stages suited to producing its final fruit.[31]

[30] J.A. Burrow, *The Ages of Man* (Oxford: Clarendon Press, 1986), 135ff.

[31] IV.xxiv.8. Translation is by Christopher Ryan, *The Banquet* (Saratoga, CA: Anma Libri, 1988).

Using the medieval commentaries upon Virgil's *Aeneid* written by Fulgentius and Bernard Sylvestris, who interpreted the epic as an allegory of human life, Dante divides the life-course into four stages, "youth," "maturity," "old age," and "extreme old age," with their respective virtues defined by the soul's changing capacities to overcome the waywardness of the body and by the amount of experience available to reason. In youth, for instance, which Dante reckons as lasting till the twenty-fifth year, a noble man should be "obedient," "gentle," and "bashful," none of which qualities shine quite so brightly in maturity, when he should have instead and in addition "temperance," "fortitude," "love," "courtesy," and "loyalty." Because of declining powers of body and, conversely, because of heightened expectations one might have for the rational powers of those over the age of forty-five, the noble man in old age must possess, above all, "justice and prudence" as well as "affability" and "generosity." Lastly, retiring from the activities of public life, the noble man in extreme old age must dedicate himself to God and look back on his journey with gratitude, feats performed largely through faithful "contemplation."[32]

According to Dante, our perfection unfolds gradually and in an orderly fashion, and our virtues are seasonable because by nature we grow into and out of them. We need courage before we can become just; we have to accumulate experiences before we can be prudent; and such virtues as shame and temperance lose something of their luster once we reach an age at which we should do right and have moderate desires and passions anyway. On Dante's model, as is commonly the case for medieval ideals of nature, wisdom is the last of virtues; it befits old age, the time when one has gathered fruits and is freed to contemplate.

Natural ideals represent, in Burrow's words, a "high norm" to which most human beings can only aspire.[33] Bembo's scale represents such a natural ideal. In fact, it throws more emphasis on

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[32] IV.xxiv-xxviii.

[33] Burrow, 135.

naturalness than do some other Neoplatonic scales, which tend to ignore aging—and certainly more than does Socrates in Plato's *Symposium*. An old courtier has a better chance of achieving the highest heights of love and beauty, primarily because through the processes of nature the old courtier has fallen into a distinct advantage, observable in the troubles impeding youths:

> The cause therfore of this wretchednesse in mens mindes, is principally sense, which in youthfull age bereth moste swey, bicause the lustinesse of the fleshe and of the bloode, in that season addeth unto him even so much force, as it withdraweth from reason: therfore doeth it easelye traine the soule to folowe appetite or longing, for when she seeth her selfe drowned in the earthly prison, bicause she is sett in the office to govern the body, she can not of her self understand plainly at the first the truth of spirituall behouldinge.[34]

"The contrary," as Bembo goes on to assert, "chaunseth to them of more ripe age" (344). Old courtiers are better able than young to "restraine the yll disposition of sense" with the "bridle of reason," for in more ripe age "the soule is not nowe so much wayed downe with the bodyly burdein." Thus,

> whan the naturall burning asswageth and draweth to a warmeth, if thei be inflamed with beawty, and to it bend their coveting guided by reasonable choise, they be not deceived, and possesse beawtye perfectly, and therefor through the possessing of it, always goodness ensueth to them.[35]

By "old," Bembo is careful to insert, he means not "the age at the pittes brinke, nor when the canellas of the body be so feble, that the soule can not through them worke her feates, but when knowleage in us is in his right strength."[36]

Situating a Neoplatonic scale within a context of physical aging, Castiglione draws our attention to the influence of the body upon the traditional Platonic pursuit of beauty and wisdom. According to Bembo, in the normal course of nature, the intellect struggles to ascend before the body's burden sinks with age. The "naturall burning" of love then wanes to a "warmth," which can be swallowed by a flame moderated by rational choice—a transition between images of fire that

[34] Castiglione, 343.

[35] Ibid., 344

[36] Ibid.

Spenser, as we shall see, adopts with significant alteration in "An Hymne of Heavenly Love." Castiglione evinces concern with the question whether the mind tempers the body or the body tempers the mind but abstains from a clear answer. Rather he seems intent on complicating the question. While Bembo gears up for his speech, he has the character of Signor Morello, the oldest member of the group and something of a *senex amans* himself, remind readers repeatedly that Bembo speaks not from experience and deny, on the basis of experience, the notion that love can exist without a body. More subtly but also more seriously, Castiglione extends this critique by having the urbane Lady Emilia pluck Bembo by the hem of his suit at the end of his ecstatic speech and warn, "Take heede (M. Peter) that these thoughts make not your soule also to forsake the bodye."[37]

In the first pair of hymns, Spenser certainly posits earthly love as a high norm, something for which one must aspire and which does not come easily. It develops over time and in stages, through a process of rationally directed growth. The language of the Dedicatory Epistle, however, is what first prompts readers to think of the ensuing spiritual progress as concomitant with the *cursus aetatis*. It collapses upon the subsequent poems the frame of a natural ideal, reinforced momentarily by the exordium of Hymn 3. The earthly hymns then continue what the Dedicatory Epistle starts. The first invokes Cupid as the patron of young women like the poet's mistress who disdain entreaty:

> And ye faire blossomes of youths wanton breed,
> Which in the conquests of your beautie bost,
> Wherewith your louers feeble eyes you feed,
> But sterue their harts, that needeth nourture most,
> Prepare your selues, to march amongst his host,
> And all the way this sacred hymne do sing,
> Made in the honor of your Soueraigne king. (H1 36-42)

Eventually, such a woman drives her admirer to martial feats appropriate to young men as he seeks to win her favor:

> Then forth he casts in his vnquiet thought,
> What he may do, her fauour to obtain;
> What braue exploit, what perill hardly wrought,
> What puissant conquest, what aduenturous paine,
> May please her best, and grace vnto him gaine:

[37] Ibid., 362.

He dreads no danger, nor misfortune feares,
His faith, his fortune, in his breast he beares.

Thou art his god, thou art his mightie guyde,
Thou being blind, letst him not see his feares,
But cariest him to that which he hath eyde,
Through seas, through flames, through thousand swords and speares:
Ne ought so strong that may his force withstand,
With which thou armest his resistless hand. (H1 218-230)

The earthly hymns retrace the initial steps of Bembo's elegant depiction of love. The first concentrates on sensual pleasures—visual, auditory, tactile—ending with the hope of innocent sexual dalliance, whereas the second concentrates on the image of beauty abstracted from sensible vision:

But they which loue indeede, looke otherwise,
With pure regard and spotlesse true intent,
Drawing out of the obiect of their eyes,
A more refyned forme, which they present
Vnto their mind, voide of all blemishment;
Which it reducing to her first perfection,
Beholdeth free from fleshes frayle infection. (H2 211-217)

Although the lover passes through the jealousies and suspicions that Bembo considers the hallmarks of young men's love, he cannot find satisfaction in this "refined forme" that an old courtier supposedly enjoys; instead, he falls back to the beauty of a single and embodied woman, whose acceptance he still craves:

And you faire *Venus* dearling, my deare dread,
Fresh flowe of grace, great Goddess of my life,
Wh&etilde; your faire eyes these fearefull lines shall read,
Deigne to let fall one drop of dew reliefe,
That may recure my harts long pyning griefe,
And shew what wõdrous powre your beautie hath,
That can restore a damned wight from death. (H2 281-287)

As we see in ideals of nature, Spenser's earthly hymns doubt the possibility of breaking free from the impulses and limitations of the body. By recounting the poet's struggles to manage love's fury, the earthly hymns accentuate the natural conditions of spiritual progress. When the poet enters the scene, he, like Bembo's young courtier, has already been refined beyond the basest longings and actions. The "disloyal" (170) and "hellish firebrand" lust (169) is a pretender to love, for it denies

that beauty is a spark from the celestial light and fixates instead on outward appearances. Yet, as the poet tells us, he too, when he was even younger than at the writing of this greener hymn, mistook beauty as simply a pleasing arrangement of "colors fair" (66) and "parts well-measured" (70). He verged on the side of lust until he "proved" that mere physical beauty decays with time and, in turn, that beauty is immortal (85-98). Now a similar struggle marks his progress in love. Instead of the poet controlling love, love "tyrannizes" him (H1 4). The exordium of Hymn 3 gestures toward the next stage in the process as it looks back in regret at a love not as sensual as lust but not totally abstracted from physical bodies either.

Although invited to supply reason as the thing that has quenched the poet's youthful heat, readers after arriving at the heavenly hymns discover something else, Christian repentance. In the exordium of Hymn 3, the poet chastises himself for his earlier pursuits of love and beauty, a self-rebuke he revives at the end of Hymn 4, avowing "late repentance" for his "follies prief":

> Ah then my hungry soule, which long hast fed
> On idle fancies of thy foolish thought,
> And with false beauties flattring bait misled,
> Hast after vaine deceiptfull shadowes sought,
> Which all are fled, and now haue left thee nought,
> But late repentance through thy follies prief;
> Ah cease to gaze on matter of thy grief. (H4 288-294)

The tone that Spenser takes is somewhat surprising when compared with Neoplatonic texts, and it certainly upsets an interpretation that Spenser is enforcing an ideal of nature, according to which the preceding love for which the poet strove would not be folly but a seasonable good. An apt parallel is, again, *Il Cortegiano*. Although Bembo extols as "godlye" young men who early "bridle their appetites, and love with reason," he recognizes this as a rare case. But the rest he is far from rebuking:

> And I wil not also hide this from you: namely, that I suppose, where sensuall love in every age is naught, yet in yonge men it deserveth excuse, and perhappes in some case lefull: for although it putteth them in afflictions, daungers, travailes, and the unfortunatenes that is said, yet are there many that to winne them the good will of their Ladies practice virtuous things, which for all they be not bent to a good end, yet are they good of them selves, and so of that

> much bitternesse they pike out a little sweetnesse, and through the adversities which they susteine, in the ende they acknowleage their errour.[38]

Young courtiers who submit to sensual love may deserve more than mere excuse, because they act lawfully: as in Spenser's first hymn, their sensual love impels them to brave actions. Yet they deserve at least excuse, according to Bembo. The cause, as he goes on to explain, is that young men are inclined to sensual love "through the weakenesse and frailtie of man" although he affixes a couple of qualifiers here as well. Young courtiers must exhibit in their sensual love nonetheless "meekenesse, courtesie, and prowess" (attributes that may also distinguish Spenser's earthly love from lust) and, upon leaving youth, abandon sensual love altogether and rein in their natural appetites with reason.[39]

Bembo's concession to the follies of youth is a mark of a natural ideal. In the heavenly hymns, however, Spenser explicitly admonishes against concessions to youthful folly. He beseeches his readers to avoid his own course altogether as though they can reach perfection more assuredly by some other route. With that admonition, he implies that, although his own repentance is late, for his readers repentance cannot come too early.

A difference between repentance and reason emerging here is something that the *Fowre Hymnes* seems designed to stress: repentance is not a seasonable good. Unlike reason, which is a natural faculty and therefore must develop in orderly steps and over time, repentance can and should always occur at this moment, now. As such it would seem to constitute the other ideal defined by Burrow, an ideal of transcendence. According to ideals of transcendence, human perfection lies outside a natural order of goods and ages. It is always available and should be sought as soon as possible. Among medieval texts, Burrow finds ideals of transcendence propagated by hagiographies, which frequently praise their subjects for exhibiting traits such as temperance, wisdom, and courage outside their "due time."

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[38] Castiglione, 345.

[39] Ibid.

Why Spenser believes that repentance can happen suddenly and outside a natural course only becomes clear as he establishes its theological modalities. It can, because, although an affect, it seems to contradict human nature and derive from beyond it, whereas reason, as displayed in the earthly hymns, must come into itself against the passions and appetites instilled by nature. Repentance irrupts after one reads the Biblical story of Christ's life and passion and understands, again through scriptural mediation, "most holy reede" (H3 211), that Christ gave up all for the sake of an undeserving humanity, a "miserable crew" (214). Spenser portrays repentance as a surrendering:

> Then let thy flinty hart that feeles no paine,
> Empierced be with pittifull remorse,
> And let thy bowels bleede in euery vaine,
> At sight of his most sacred heauenly corse,
> So torne and mangled with malicious forse,
> And let thy soule, whose sins his sorrows wrought,
> Melt into teares, and grone in grieued thought.
>
> With sence whereof whilest so thy softened spirit
> Is inly toucht, and humbled with meeke zeale,
> Through meditation of his endlesse merit,
> Lift vp thy mind to th'author of thy weale,
> And to his soueraine mercie doe appeale;
> Learne him to loue, that loued thee so deare,
> And in thy brest his blessed image beare.
>
> * * *
>
> Then shalt thou feele thy spirit so possest,
> And ravisht with deuouring great desire
> Of his deare selfe, that shall thy feeble brest
> Inflame with loue, and set thee all on fire
> With burning zeale, through euery part entire,
> That in no earthly thing thou shalt delight,
> But in his sweet and amiable sight. (H3 246-259, 267-273)

But to what does one surrender? Read against the poet's professions of grief and longing in the earthly hymns, his assertion that until repentance one's "flinty hart…feeles no pain" suggests the power of divinity. Apparently, by nature the heart can feel grief when its desires go unsatisfied—the earthly hymns provide ample evidence of that—but from a theological perspective the heart is truly flint, because it is hardened to the gratitude it should feel for receiving deliverance from sins at

Christ's expense. The heart is prideful. Hence, the next stanza speaks of the humbling effect of "meeke zeale" (254). In the heavenly hymns, meek and "burning" zeal replaces youthful heat (271). After the exordium of Hymn 3, Spenser does not mention humanly felt heat till this moment when it assumes new form. The supernatural origin of burning zeal implies that the love of the heavenly hymns is heavenly to a degree that the heavenly love of the first two hymns is not: it stands apart from, not in continuity with, natural *eros*. Consequently, zeal is able to accomplish what maturity, a natural process, cannot, which is to quench youth's heat—like a greater flame swallowing a lesser.

Repentance is an unseasonable, transcendent good; nevertheless, it is but one good. Possibly, a transcendent good such as repentance may initiate a process of spiritual growth akin to natural growth in that it proceeds in regular, successive stages but different in that its stages are unconfined to certain periods of life. This seems to be the kind of process displayed in the heavenly hymns, which continues from love of God and Christ to love of neighbors (H3 190-204) and eventually to the contemplation of Sapience herself:

> Thence gathering plumes of perfect speculation,
> To impe the wings of thy high flying mynd,
> Mount vp aloft through heauenly contemplation,
> From this darke world, whose damps the soule do blynd,
> And like the natiue brood of Eagles kynd,
> On that bright Sunne of glorie fixe thine eyes,
> Clear'd from grosse mists of fraile infirmities. (H4 134-140)

What Spenser shows here resembles the journey of sanctification that Redcrosse Knight undergoes in Book I of *The Faerie Queene*, especially Canto X when he travels through the House of Holiness up to the Mount of Contemplation. Because the path begins with repentance, which can intercept nature at any moment, no succeeding part need correspond to a particular age. That goes presumably even for Sapience, which according to a natural ideal should accompany old age.

Of course, *The Faerie Queene* also offers a striking contrast to the *Fowre Hymnes*, which encourages young readers to take up the path to Sapience immediately and depicts the poet, who is only in his forties, as tasting the joys of contemplation. In *The Faeire Queene*, the figure of

Contemplation is plainly old—and not old in Bembo's expansive sense of "not young" but withered and feeble of body, as Spenser lavishly describes him:

> There they do finde that godly aged Sire,
> With snowy lockes adowne his shoulders shed,
> As hoarie frost with spangles doth attire
> The mossy braunches of an Oke halfe ded.
> Each bone might through his body well be red,
> And euery sinew seene through his long fast:
> For nought he car'd his carcas long vnfed;
> His mind was full of spirituall repast,
> And pyn'd his flesh, to keepe his body low and chast. (I.x.48)

At first, a reader may suspect that Spenser is allegorizing here the *contemptus mundi* that heavenly contemplation demands by imaging him as the grotesque deterioration of the most natural part of ourselves. This interpretation holds water for a while. Yet, as Spenser continues, the necessity for revising it becomes apparent, for Contemplation's age also seems to indicate the appropriate time of life for the activity that he represents. While Redcrosse Knight stares rapturously at gleaming "Hierusalem," Contemplation must check his desire to remain on the Mount:

> O let me not (quoth he) then turne againe
> Backe to the world, whose ioyes so fruitlesse are;
> But let me here for aye in peace remaine,
> Or streight way on that last long voyage fare,
> That nothing may my present hope empare.
> That may not be (said he) ne maist thou yit
> Forgo that royall maides bequeathed care,
> Who did her cause into thy hand commit,
> Till from her cursed foe thou haue her freely quit. (I.x.63)

Although signifying spiritual growth, Contemplation's body also doubles back to the physical. Redcrosse Knight's prior duty, according to Contemplation, is to protect the one, true faith from the handiworks of Satan by performing works of charity. But when one considers that on the depraved earth and among the corrupt and recidivist human beings who populate it the defense of the faith and the works of charity probably will have no end, it appears that Contemplation enjoins Redcrosse Knight to delay the fruits of contemplation till he becomes old like himself and unfit for public service—a return to the ideals of nature.

We should recall Robert Ellrodt's statement that Spenser nowhere tells readers to postpone the pursuit of wisdom till old age. If the *Fowre Hymnes* implies that wisdom can be possessed in youth, Spenser would be endorsing a full-fledged transcendence ideal with roots in the Bible and Christian hagiography and homiletics. An especially succinct example appears in the *Book of Wisdom*, often cited as a source for Spenser's Sapience: "For honourable age is not that which standeth in length of time, nor that is measured by number of years. But Wisdom is the gray hair unto men, and an unspotted life is old age" (4:8). Here wisdom does not wait upon the revolution of years; in fact, it has nothing to do with time but everything to do with the way we live. The passage divides corporeal and spiritual ages, a common *topos* in sermons and saints-writings from Augustine onward.

Christ offers another example, though one fraught with problems in evaluating the human *cursus aetatis* because of his dual natures. In many medieval paintings and narratives, Christ is depicted as the archetypal *puer senex*, the ancient boy, who attained wisdom far in advance of his years.[40] These visual and verbal portraits generally allude to Luke 2:46-7, when Mary and Joseph go searching through Jerusalem for their missing twelve-year-old son: "And it came to pass, that after three days they found him in the temple, sitting in the midst of the doctors, both hearing them, and asking them questions. And all that heard him were astonished at his understanding and answers." Of course, Christ also preached the transcendence of nature in the downward direction: to enter the kingdom of heaven we adults must become like little children (Matthew 18:3).

Erasmus emphasizes the especially Christian value in pursuing wisdom *contra naturam* when he has Folly endorse a proverb taken from Apuleius: "*Odi puerulos praecoci sapientia*" [I hate small boys with precocious wisdom].[41] In the *Adages*, when he cites the same proverb, Erasmus says that generally the opinion has grown strong that "little boys too prematurely wise either will not be lively

[40] Burrow, 135-143.

[41] *The Praise of Folly*, trans. Robert M. Adams (New York: W.W. Norton, 1989), 14.

or will be mad as soon as they come to a ripe age."[42] A more general but shorter variation on the proverb was "soon ripe, soon rotten," an aphorism that one finds quite often in texts of the early modern period.[43] At the time, it had physiological justification: the early attainment of the ideal humoral temperament nourishing wisdom—the dryness that normally comes later in life—indicated a low level of healthful moisture, prophesying an early death and fits of distracting melancholy. As Burrow writes, when Erasmus has Folly affirm the line from Apuleius, he "follows a well-established medieval custom of attributing such sentiments to wicked or misguided speakers, who seek to lure young people from the straight and narrow path by unscrupulous appeals to doctrines of naturalness."[44] Indeed, Folly ranks youth as one of her most loyal handmaids and boasts of herself, folly, as the only viable means of prolonging youth, which one enjoys as long as one remains foolish.[45] The two states are veritably identical.

We might suppose that Christians would always encourage others to pursue wisdom as soon as possible, but as Burrow has demonstrated, such was not always the case. He cites different sermons by Gregory the Great, some in which the pope lauds saints for their having transcended their ages and others in which he warns his auditors, who are Christians of a more ordinary sort, about striving to reach beyond what their natures will allow. The saints and Christ constitute exceptions—a premise useful to preserving ecclesiastical orders and their age requirements.

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[42] Adage 3100. Desiderius Erasmus, *Opera Omnia*, vol. II.7, ed. R. Hoven (Amsterdam: Elsevier, 1999), 98. Translation is mine.

[43] E.g., Lemnius, 28 r - v; and Henry Cuffe, *The Difference of the Ages of Man's Life* (London, 1607), 95. Shakespeare expresses the idea in *Romeo and Juliet*: "And too soon marred are those so early made" (I.ii.13); and in *Richard III*: "So wise so young, they say, do never live long" (III.i.79. For a discussion of like occurrences in Medieval texts, see Burrow, 147-150. The proverb "soon ripe, soon rotten" seems as though it could refer to the differences in the lifespans between animal species; as some Renaissance writers mention, overall lifespan is in proportion to the length of time it takes for an animal to reach maturity. The idea can be traced back to Plato's *Republic* (546a). However, I have not seen a Renaissance writer use the proverb in this way. Limited to humans, "soon ripe, soon rotten" also opposes another oft-quoted proverb, discussed a few pages below, that to be old long one must be old early.

[44] Burrow, 147.

[45] Erasmus, *Praise of Folly*, 14-15.

Gregory's sermons were reproduced and disseminated in later centuries in England, and Spenser's "Maye" eclogue evinces concern over the application of natural ideals to priests.[46] In the *Fowre Hymnes* and the Contemplation episode of *The Faerie Queene*, however, Spenser handles a broader and less ecclesiological problem. What he seems to be acknowledging is the difficulty of discriminating between the will suborned by divine grace, which may come to desire salvation and holiness, and the corporeal material upon which it works. Although now *de rigeur* to note the danger and corruption that the body posed to reformers, for whom holiness comprised, in part, the temperance needed to master it, the body need not always threaten and wreck the works of a will properly supported by divine grace. Although often hindering the will's progress, at other times the body could, through the effort of divine grace again, help it. Gless notes that for reformed Protestants of various stripes the "gracious immanence" of God infusing and directing everything in the world was one of several means by which the distance between nature and grace was "constantly annulled."[47] This immanent grace complicates any judgment about how reformist Christians of early modern Europe may have viewed the prolongation of life, conceived in the more ordinary sense of living into old age. On the one hand, one can easily find among reformed Protestants the kind of pessimistic statement espoused by Calvin—which does not give even Calvin's complete view on the topic—that this life is a sty of misery enlarged by the time spent in it. For example, *A Discourse on Life and Death*, a *memento mori* tract written by the Protestant Philippe de Mornay, a friend of the Sidney circle, comes to this bleak assessment:

> Conclude then, that Childhoode is but a foolish simplicitie, Youth, a vaine heate, Manhoode, a painefull carefulnesse, and Old-age, a noysome languishing: that our playes are but teares, our pleasures, fevers of the minde, our goodes, rackes, and torments, our honors, heavy vanities, our rest, unrest: that passing from age to age is but passing from evill to evill, and from the lesse unto the greater: and that always it is but one wave driving on another, untill we be arrived at the Haven of death.[48]

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[46] I am working on an essay comparing the "Februarie" and "Maye" eclogues over the axis of aging.

[47] Darryl Gless, "Nature and Grace," in *The Spenser Encyclopedia*, ed. A.C. Hamilton (Toronto: University of Toronto Press, 1990), 505. I refer to this kind of grace in the previous chapter as well.

[48] Philippe de Mornay du Plessis-Marly, *A Discourse of Life and Death*, trans. Mary Sidney Herbert, Countess of Pembroke (London: 1592), D1 v – D2 r.

When reading such a profession, however, one must keep in mind its rhetorical purpose, which is to help tamp down the natural inclinations of human beings to savor this world too much and to forget about its position relative to heaven. Almost inevitably, an injunction like de Mornay's ignores the opposite side of the coin, the gratitude one is to feel toward God for life and for the opportunity to serve him. De Mornay does not remind readers of that until the final two pages, when he cautions that, despite the vanity and misery of the world, death is not "a thing to be wished for."[49] Christians, and perhaps reformist Christians more so, found Stoic indifference to life an amenable creed so long as its presumed endorsement for suicide could be subtracted or revised (wishing for death but not acting upon the wish). The Elizabethan minister Richard Greenham writes, "The readiest way to obtaine life is to be content, either to live or die, and to commit ourselves to the Lord, knowing that nothing ever perished, which was committed to him."[50] George Herbert's *The Temple* is remarkable for often bringing both sides into view and exploiting the tension between them.[51] But, as with de Mornay, the rhetorical situation sometimes required tipping the balance between the two tenets constituting indifference—not loving life yet not wishing for death, or wishing for death yet wanting to fulfill spiritual duties.

Alternately, some reformed Protestants, or the same reformed Protestants at different times, stress the blessing of long life for the added goodness that comes with old age—a notion usually indicative of natural ideals. As Plato, Cicero, and Seneca wrote, when the body's heat wanes at the stage of maturity and afterward, psychological benefits accrue. The parts of the soul come by nature to a better temperament than what they had in youth, the passions subside, and sexual lust especially fizzles, posing less of a threat to reason. Plato's *Republic* features the *locus classicus* of the

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[49] Ibid., E2 r – E2 v.

[50] *The Workes of the Reverend and Faithfull Servant of Jesus Christ M. Richard Greenham*, ed. Henry Holland (London, 1601), 286.

[51] As examples, see "Affliction (2)," "Employment (2)," "Life," "Home," "Time," "Man's Medley," "The Size," "The Discharge," "The Elixir," and "Death."

psychological benefits of old age, in particular its benefit to contemplation and wisdom. In the first book, the elderly Cephalus celebrates old age as the time of life when one is finally given over to thought and philosophical discussion because only then is one freed from the torments of lust and other passions.[52] Centuries later, when Cicero defends old age as a positive good, he quotes heavily from the speeches of Cephalus. What we might call the Cephalus thesis infiltrates Bembo's depiction of love, as seen, but it appears in theological writings of the period as well. The French minister Simon Goulart, who replaced Theodore Beza as the head of the Genevan churches, invokes Plato and Cicero in *The Wise Vieillard*, which manages the twin, sometimes contradictory purposes of foiling the natural desire for long life and consoling the aged against the miseries of senescence. In the latter capacity, Goulart repeats Cicero's fourfold apology to a tee, one of which opposes the presumption that old men no longer enjoy pleasures:

> But if they account the follies, fond jollities and gambolles of youth for true pleasures, their accusation is false, and they speake injuriously of Old age, which more procures great good unto us, blotting out quite, whatsoever is most vicious and bad in young men, to wit, carnall pleasure, a capitall enemie to us all, which headlong plungeth all those that are vassalls and slaves unto her, into gulfes of eternall perdition, is the mother of gluttony, drunkennesse, whoredome, adulterie, of all dissolutenesse, and debauched villanies, and in fine is the cause of the ruines of Common weales and families.[53]

Such a view of wisdom as a gift of old age also has scriptural antecedent, one used on the title-page of Goulart's English translation: "O how comely is the wisdom of old men, and understanding and counsel to men of honour" (Ecclesiasticus 25:5).

The Cephalus thesis diminishes the power and effect of the will on the reduction over time of carnal pleasures, which it conceives as fading involuntarily. The will it portrays likewise as a rather passive beneficiary of a natural, inevitable process. But it speaks to a darker, more knotted problem for those who imagine and venerate old age as a time fit for contemplation and wisdom, the problem of disentangling the efforts of the will from the effects of nature. Plato may use the example of

[52] 328c-331d.

[53] *The Wise Viellard*, trans. T.W. (London: 1621), 51.

Cephalus, who quickly disappears from the philosophical discussion, ironically—as a mouthpiece of a conventional view that Socrates opposes. Ordinarily, Socrates insists upon educating the young and exhorts them to take up philosophy and continue with it all through life; by contrast, in the *Gorgias*, Socrates's defiant adversary Callicles condones a philosophical life only for children, who, he thinks, should abandon it as they grow up.[54] In Epistle 26, Seneca professes to use his own old age—a time when he is decrepit but not yet broken—for characteristic self-evaluation but with new emphasis on the differentiation between "his" efforts and the effects of his body: "The mind bids me do some thinking and consider how much of this peace of spirit and moderation of character I owe to wisdom and how much to my time of life."[55] The sixteenth-century French court physician Laurent Joubert devotes the dedicatory epistle of *Popular Errors* to a question debated, as he claims, between the Platonists and Aristotelians of his era about whether wisdom emerges over the time because the body dries or because the mind grows stronger; he comes down on the side of the Aristotelians, who champion the mind's growing strength.[56]

Although Goulart recapitulates the arguments of Cephalus and Cicero, he also assigns many of the debilities commonly associated with old age to dissolute and wanton practices taken up in youth. This is the "sink" theory of old age. According to it, old age is a sink or trough catching all the accumulated damage done to the body by intemperance of youth, especially indulgences of lust, drink, and gluttony. In *De Senectute*, Cicero encapsulates the theory in a line that Renaissance medical writers and moralists sometimes cite: "An intemperate and indulgent youth delivers to old age a body all worn out" [*Libidinosa enim et intemperans adulescentia effectum corpus tradit senectuti*].[57] Conversely, an adage that Cicero quotes which was probably more frequently repeated in Renaissance texts admonishes forbearance in youth to produce a healthier old age: "Become old

[54] 484c-485e.

[55] Seneca, *Epistulae Morales*, Vol. I, trans. R.M. Gummere (Cambridge, MA: Harvard University Press, 1925), 186-189.

[56] Laurent Joubert, *Popular Errors*, trans. Gregory de Rocher (Tuscaloosa: University of Alabama Press, 1989), 26-31.

[57] Cicero, *On Old Age*, trans. W.A. Falconer (Cambridge, MA: Harvard University Press, 1927), ix.29 (pp. 38-39.)

early if you would be old long."[58] As the proverb implies, old age can become a repository of health and mental clarity if one acts moderately in earlier years—a treasure of potency expendable in old age when one is freed from public obligations. After asserting the miseries of long life, Goulart also notes that many of the "inconveniences and faults" usually attributed to old age should be imputed instead to "our corrupt manners and nature," and in the later chapters he basically enjoins readers to follow the counsel of Cicero's proverb.[59] Old men cannot enjoy the health and fruits due to their age without the continual effort of the will:

> Old age doth not by and by so weaken a man, but that by divers exercise, wherewith he may inure his bodie and minde, and by ordering himself well in his drinking, eating, sleeping, by giving himselfe ease, vacancie and rest, and not tyring himself, and spending his spirits with much labour and studie, he may keepe himself from bending in the hammes, and stooping in the showlders, and be still an able and practiced man.[60]

As the example of Goulart demonstrates, reformed Protestants could, and probably often did, hold two contrary ideas about old age, that after maturity virtue and wisdom become easier because appetites of the body weaken and that the appetites of the body weaken because virtue and wisdom become easier. In the terms of Stoicism, this problem might be posed by the question, "Over time, do our bodies become weaker, or do 'we' (understood as a mastering reason) become stronger?" As Seneca says, he is not always sure how to answer this. Reformed Protestants may have been less sure, finding it harder than Seneca to separate the body from "we." Greenham defines wisdom appropriate to a Christian as "the wisdome of sicknesse," which rests upon understanding of the

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[58] Ix.32 (pp. 40-41). Cicero's speaker, Cato the Elder, actually detests this proverb and claims to have achieved his vital old age by living contrary to its advice: "I have never assented to that ancient and much-quoted proverb, which advises: 'Become old early if you would be old long.' For my part I would rather not be old so long than be old before my time." [*Nec enim umquam sum assensus veteri illi laudatoque proverbio, quod monet mature fieri senem, si diu velis senex esse. Ego vero me minus diu senem esse mallem quam esse senem ante quam essem*.] Cicero's text is a good example of natural ideals about aging.

[59] Ibid., 47; and 35, where Goulart quotes Cicero's proverb approvingly.

[60] Ibid., 50-51. Goulart is engaging a question related to the question whether old age is a disease, which I discussed in Parts One and Two, namely, whether the disabilities often associated with old age are natural or the result of habitual behaviors. Renaissance authors debated the point. Luigi Cornaro takes an extreme view that the typical afflictions of old age will never come to those who practice strict rules of health; they do not reflect nature's intentions. Most others, however, like Goulart, cede something to both nature and choice.

body's mortality and consists of "continuall thinking, that death is nigh."[61] As closely as his counsel resembles the Stoic doctrine of learning to die, it differs in that remembrance of death leads to repentance—a heartfelt, passionate suffering and increasing awareness of God's mercy.[62] For Stoics, the accumulated afflictions of life result in fearlessness based on the intellect's separation from the body, but for Greenham they promote humbleness of heart.[63] Longer life affords more opportunities for repentance. Greenham, however, also acknowledges that when tabulating the time life affords for God one must deduct the fourteen years of youth, "wherein we are unfit to glorifie God, or doe good to man."[64]

For reformed Protestants, divine grace would have been foundational to either answer. The natural weakening of the body with age could be viewed as the blessing of God as, more clearly, the ability of the will to choose the good was. A divinely infused nature helps define the fitness of action, as the figure Contemplation in *The Faerie Queene* assumes. Fleetness and strength of body, according to him, indicate something of the way Redcrosse Knight is to live his life so long as he has them. Likewise, the hoariness and frailty of body render what is inappropriate for Redcrosse Knight appropriate for Contemplation.

In the *Fowre Hymnes*, the mysterious interaction between grace and nature emerges at the disjunction between what Spenser exhorts of his readers and what he shows of himself. Starting with the exordium of Hymn 3, what Spenser exhorts of his readers seems designed to illustrate faith's power over nature. Faith is stronger because, in part, it pays no heed to season. If Spenser in the exordium of Hymn 3 is right, one can cross over to the path of righteousness at any point. This idea

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[61] Greenham, *Works*, 286.

[62] Ibid. "By this they that had no delight in the word, if once they take this account, that every day they thinke they draw their last breath, the word will be full of comfort to them. And then the meditation of death working above the hope of long life, the wisdome of sicknesse wil be found to be above the wisdome of health." Greenham illustrates his point with the Old Testament examples of Hezekiah and Balthasar.

[63] Ibid., 418.

[64] Ibid., 285. In his "strange Aritmeticke" based on Psalm 90 ("Lord, teach us to number our days"), Greenham drops an additional five years calculating from the 35 years left after sleep to the 16 years left after youth. If he tacitly subtracts five years for infancy, youth spans roughly five to nineteen years of age.

was something upon which Lactantius insisted, using it to draw a contrast between Christianity and Roman Stoicism. According to Stoics, Lactantius writes, in youth every person has the choice between following a path of virtue or a path of vice. The so-called Pythagorean Y, whose bottom stem represents life lead up through youth and the two branches, the paths of virtue and vice during the rest of life, illustrates the choice. (Emblems of "the choice of Hercules" signify much the same; Hercules also made the choice in his youth.) The Bible offers a parallel to the choice at Matthew 7:13-14, on the wide path to hell and the narrow path to heaven. But, as Lactantius argues, whereas Stoics and other classical philosophers insist that after the choice is made one cannot switch to the other path, Christians believe that one can cross (for better or worse) at any time, even well after the initial fork.[65]

In what Spenser dramatizes of himself, though, faith is shown to work within the conditions of nature. After his repentance, the path to holiness is long and arduous. Like Redcrosse Knight, he continues to struggle, and he does so with a weakness parallel to that which he exhibits in the earthly hymns. The final hymn concludes with two stanzas in which he admonishes himself to turn away from his "matter of…grief" and look up toward the "soveraine light" of Sapience (294-5). As in the earthly hymns though now in higher register, his satisfaction depends upon the condescension of the beloved. The poet believes that he has yet to reach as far as some men can, who along with the angels perceive the face of Sapience:

> But who so may, thrise happie man him hold,
> Of all on earth, whom God so much doth grace,
> And lets his owne Beloued to behold. (H4 239-241)

Instead, the poet comforts himself with the thought that he is able "to admyre so heavenly thing / And being thus with her huge loue possest, / In th'only wonder of her selfe to rest" (236-238). He constantly projects the enjoyment of Sapience into the future. Though no longer "green," he may

[65] *Divine Institutes*, Book VI, 3.1-4.24 (trans. Anthony Bowen and Peter Garnsey (Liverpool: Liverpool University Press, 2003), 333-338).

only "wonder" at her. He has yet to perceive her. He may not till he is older—or may never while on earth.

The disjunction between what Spenser says and has done makes it unclear whether earthly love is needed to prepare for heavenly love. Although the modalities of love and beauty alter between the two pairs of hymns, the second pair may build upon the progression of the first pair if it is necessary for us mortals to learn by trial—to recognize perhaps the most certain way our natures allow—the shortcomings of some form of earthly love before we can begin to appreciate the superiority of God's love and wish to have it. The drama of the *Fowre Hymnes* tells such a story. The poet discovers divine love not despite of but as a result of earthly love's failure to satisfy him. However ennobling, earthly love has disabilities: it leaves him longing and wasted. It never gives him the rest he craves, and it saps him of his living spirits. The love from God, however, is opposite: it offers eternal rest, and it renews. It thus redefines love, which before appeared to result from a lack.

One could dismiss Spenser's story as peculiar and claim that he included it for the sake of confession, not as a model for readers. But a few points militate against that response. One, the dedicatory epistle obliquely praises earthly love, as noted, through the two Countesses. Second, "retractation" is not the same as repudiation; as Mary Oates has shown, the word could mean something like "re-handling."[66] Lastly, the proem of Book IV of *The Faerie Queene*, published the same years as the *Fowre Hymnes*, defends the love that distracts "fraile youth" as a the root of all honor and virtue (1-2). In light of Spenser's renewed praise, earthly love looks like a good of nature that the heavenly hymns rectify and sanctify by setting it within a wider perspective.[67] If so, what Spenser bemoans in the exordium of Hymn 3 may be that he once extolled nature so highly and for

[66] Oates, "Spenser's Retractation," 163-164.

[67] I owe much to analyses by critics who come to a similar conclusion: Robert Ellrodt, *Neoplatonism in the Poetry of Spenser* (Geneva: Droz, 1960); William Nelson, *The Poetry of Edmund Spenser: A Study* (New York: Columbia University Press, 1963); and Enid Welsford, *Spenser: Fowre Hymnes, Epithalamion—A Study of Edmund Spenser's Doctrine of Love* (Oxford: Basil Blackwell, 1967).

itself. From the poet's experience one can extrapolate to a broader human problem: maturity, which promises the right perspective, proves elusive. Its repeated displacement accents our temporality and the incommensurable gulf between us and an eternally perfect God. In the story he tells of himself, Spenser resembles St. Augustine, who surmised that God made him stumble upon Platonism before his conversion so that he might apprehend the difference between presumption and confession.[68]

Of course, blunting the hortatory edge of Spenser's example stands the exordium of Hymn 3. It admonishes readers to bypass presumption altogether. But what if they cannot? With the prominence given to the heat and foolishness of youth, avoidance of an arrogating love appears nearly impossible, especially for the young, unless God intervenes. Unfortunately, as Hymn 3 goes on to illustrate, we must prepare ourselves for God first, and preparation is hardest for those most in need, such as the young, who are trammeled by the impulses of the body. The hymns offer a solution to this paradox: in the light of the second pair of hymns, earthly love can act as an instrument of divine grace. Because the young cannot contravene their natures, grace may work through a love suited to their natures in order to prepare them for salvation. But then of course Spenser has little praxis to recommend, and young readers little to do. Then, Spenser's exhortation loses something of its hortatory power.

Uncertainty appears to be built into the hymns and grounded in a deep tension. If Spenser brings wisdom too far forward in life or makes earthly love out to be too beneficent, he underrates the corruption of human nature. Yet if he sets wisdom too late or makes earthly love out to be too intractable, he underrates the power of transcendent grace.

[68] St. Augustine, *The Confessions*, VII.20/26 (trans. Maria Boulding (New York: Viking, 1997), 142).

CHAPTER 10

BEN JONSON AND THE SENECAN PARADOX OF LONG LIFE: THE CARY-MORISON ODE

The contrast between the plaudits he lavished on Francis Bacon and the acerbic condemnation of prolongevous ambitions in his dramas make us wonder what, if anything, Ben Jonson understood of Bacon's ultimate vision of the new science. Nowhere in his works does he say. A brief ode written to honor Bacon on his sixtieth birthday in January 1621, three years after he had been created Lord Chancellor, concentrates on his birth and service and ignores his philosophical writings.[1] The unadulterated praise in *Timber: or Discoveries* extols his eloquence and diagnosis of common epistemological follies but stops short of mentioning, much less appraising, the revision of the concept "nature" implied by the new logic.[2] This last point is the peculiar one. As I argued in Part Two, Bacon took the highest practical objective of his new science, the prolongation of life, from alchemists. For Jonson, alchemy fuses greed and ignorance into projects that twist and tailor nature to suit the most fanciful and improbable of ambitions. Clearly, one such misguided ambition is the rejuvenation and perpetual health promised by the *elixir vitae*, which Jonson mocks more than do many alchemical satirists preceding him. Although the focus of this chapter is another work into

[1] "Lord Bacon's Birthday" (*Underwoods* LI) stresses the continuity between Elizabethan past and Jacobean present: by destiny, Francis occupies the "ancient pile" (1) York House, which his father Nicholas occupied when Francis was born, and like his father he once served as Lord Keeper of the Great Seal although now he has ascended to even higher rank where he serves as "the wisdom of the king" (20). Like many personal panegyrics of the day, the poem includes a wish or prophecy that Bacon live long; the fashionableness of the remark detracts from the sense that it registers a value of special importance to Bacon. Nonetheless, hindsight imbues the lines "Whose even thread the Fates spin round and full, / Out of their choicest, and their whitest wool" (15-16) with wryness: Bacon's demise from bribery charges followed a few months later, and he lived only five years more. For Jonson's lyrics, including the Cary-Morison Ode, I have used *The Complete Poems*, ed. George Parfitt (New York: Penguin, 1988; revised, 1996). This is also my source for *Timber: or Discoveries* (see below).

[2] See Jonson, *The Complete Poems*, 401-3 and 436-7 (lines 1091-1171 and 2589-2595). Future references to *Timber* give line numbers only. A remark recorded by William Drummond also lauds Bacon's eloquence; see *The Complete Poems,* 471 (lines 365-367). The closest Jonson comes to acknowledging Bacon's interest in prolonging life may be "An Epigram to My Jovial Good Friend Mr. Robert Dover, on his Great Instauration of His Hunting and Dancing at Cotswold," in which he says that the Cotswold games "renew the glories" of King James and "keep alive his memory" (4-5). This interpretation of the title's allusion to Bacon, however, would be a stretch.

which human longevity figures quite heavily, the Cary-Morison Ode, a brief review of three dramas will help to establish a context in which to read it.

As critics such as Edward Partridge, Alvin Kernan, and Leo Salingar have written, Jonson capitalizes on the metaphorical fecundity offered by alchemy in the three dramatic pieces in which its imagery and milieu rise to highest prominence, the plays *Volpone* (1606) and *The Alchemist* (1610) and the masque *Mercury Vindicated from the Alchemists at Court* (1615).[3] Alchemy, with its goal of transmutation and its temptation to endless riches and deific power, provides Jonson a potent and versatile symbol of human striving and self-deception while its bizarre, singular idiom gives him the fodder for entertainingly bombastic speeches that substantiate his belief that corrupt language reveals corrupt minds and manners.

By the time Jonson wrote, alchemical satire already had a venerable tradition behind it. Stanton Linden has charted many of the English examples within this tradition, which grew in response to the credence shown alchemy by European courts and scholars.[4] Of the many examples that Linden has collated, most target alchemy's metallurgical craft; they ignore the *elixir vitae*. Two of the most famous examples may represent the rest. In Chaucer's *Canon's Yeoman's Tale* and Erasmus's colloquy "Alchemy," the adept, lacking any clue how to transmute metals, is a charlatan who uses dreams of riches to bilk clients of gold. Neither story mentions perpetual youth and health.[5]

[3] See Edward B. Partridge, *The Broken Compass* (New York: Columbia University Press, 1958), esp. 70-160; Alvin B. Kernan, "Alchemy and Acting: The Major Plays of Ben Jonson" *Studies in the Literary Imagination* 6 (1973): 1-22; and Leo Salingar, "Comic Form in Ben Jonson: *Volpone* and the Philosopher's Stone" in *Modern Critical Interpretations: Ben Jonson's* Volpone, ed. Harold Bloom (New York: Chelsea House, 1988), 45-66.

[4] Stanton J. Linden, *Darke Hierogliphicks* (Lexington, KY: University of Kentucky Press, 1996), 37-103.

[5] Erasmus, of course, is not English, but, as Linden says, his *Colloquies* were widely read in England and influenced many subsequent English satires. Other alchemical satires of sixteenth-century England that treat alchemy as the art of chrysopoesis and ignore its corollary of life extension include John Lyly's *Gallathea*, Reginald Scot's *Discoverie of Witchcraft* (book 14), and Robert Greene's *Friar Bacon and Friar Bungay*. The reason for this bias may be partly formal: the manufacture of gold enables much word-play between alchemy and theft, a favorite topos of Erasmus and his imitators.

Satires featuring the elixir of life increased in number after the advent of Paracelsian chemistry.[6] *The Alchemist* is among the longest and best of these. Although Jonson's arch alchemist, Subtle, mirrors Erasmian predecessors in certain ways—for instance, he is a confidence man who manufactures gold in the ironic sense that he exchanges empty promises for money—he differs in that his repertoire of tricks also includes the bait of perpetual youth. His most credulous gull, Epicure Mammon, whose double name reflects the twin quests of alchemy, desires the philosopher's stone, in part, on Subtle's assurance that it will

> Restore his years, renew him, like an eagle,
> To the fifth age; make him get sons and daughters,
> Young giants; as our philosophers have done,
> The ancient patriarchs, afore the flood,
> But taking, once a week, on a knife's point,
> The quantity of a grain of mustard of it;
> Become stout Marses, and beget young Cupids. (II.i.55-61)[7]

The religious language ("renew him, like an eagle," "fifth age," and "ancient patriarchs") betrays the millenarian expectations which Subtle masterfully turns to excite Mammon and convince him of the stone's truth. According to John S. Mebane, the play explodes an illusion at the core of occult philosophies of the Renaissance "that the individual can realize a godlike potential through a series of self-transformations and that this perfection of the soul can lead directly to the radical reformation of nature and society."[8] This illusion falls not to Subtle, who uses alchemy cynically, but to Mammon, who imagines his life trans-shifted into a paradisiacal banquet of delicacies from around the globe

[6] Other satires that mention alchemy's quest for prolonged life include Joseph Hall's *Virgidemarium* ("Satire 4" of book 2) and Thomas Lodge's "Epistle 7" in *A Fig for Momus*. Linden sees a Paracelsian influence in the first of these. Thomas Nashe includes a brief gibe at alchemy's quest for immortality in *The Unfortunate Traveller* that does not obviously target Paracelsians although Nashe mocks Paracelsus via Harvey in *Have with You to Saffron-Waldon*. Another early source of satire against alchemy's life-restoring quintessence is Henry Cornelius Agrippa's *Of the Vanitie and Uncertaintie of Artes and Sciences* (Chapter 90), an influence on Lodge and Nashe. For a more detailed discussion of these and other works, see Linden, 62-103.

[7] My text of *The Alchemist* comes from *The Complete Plays of Ben Jonson*, Vol. 3, edited by G.A. Wilkes (Oxford: Oxford University Press, 1982), 223-356.

[8] John S. Mebane, *Renaissance Magic and the Return of the Golden Age: The Occult Tradition and Marlowe, Jonson, and Shakespeare* (Lincoln, NE: University of Nebraska Press, 1989), 137.

(II.ii.72-87). With renewed body and unassailable health, he expects to prolong his sybaritic indulgences:

> For I do mean
> To have a list of wives and concubines,
> Equal with Solomon, who had the stone
> Alike with me; and I will make me a back
> With the elixir, that shall be as tough
> As Hercules, to encounter fifty a night. (II.ii.34-8)

Mammon's sensuality distracts and exposes him to all the snares and frauds of the alchemist—his idiosyncratic and therefore deracinated language, his esoteric lore, his hieratic theories immune to experiments. Jonson divulges Mammon's stupidity when Subtle convinces him that he can prove Adam an alchemist by showing a book that Adam wrote in High Dutch and again when, having just evoked the salacious image of Mammon begetting young Cupids on some unnamed Venus, Subtle persuades him that the whole *magisterium* fails because he does not have holy and charitable purposes in mind.

Although not expressly about alchemy, *Volpone* relies more heavily on the imagery and language of rejuvenation and vitality than does *The Alchemist*. An essay by Salingar on the topic warrants even greater elaboration than what I can give here. Of course, there is the memorable scene in which Jonson lampoons quacksalvers by having Volpone don the disguise of the mountebank Scoto of Mantua and hawk a medicinal oil whose virtue surpasses "Raymond Lully's great elixir" and "Paracelsus, with his long sword" (II.ii.129, 131).[9] Initially, Volpone-Scoto distances himself from alchemists, whom he derides as aping impostors, but really this is all part of the ruse designed to raise his own "chemical art" above that of garden-variety alchemists. The resemblance between his empiric medicine and alchemy, especially their obfuscating language, is noted by the skeptical Peregrine: "But alchemy / I never heard the like: or Broughton's books" (II.ii.117-118). Along with perplexing idiom is the bait of imperious effect, which the *oglio del Scoto* shares with the philosopher's stone: "For, this is the physician, this the medicine; this counsels, this cures; this gives

[9] For the text of *Volpone*, I have used the *New Mermaids* edition edited by Philip Brockbank (New York: W.W. Norton, 1968).

the direction, this works the effect: and, in sum, both together may be termed an abstract of the theoric, and practice in the Aesculapian art" (II.ii.110-115). By collapsing all the medical art into a solitary nostrum, Volpone hopes to delude his audience with the Edenic fantasy of perfection without labor. The song by Volpone's dwarf Nano details its supernatural effects, all bent toward preserving the body's perfection of function against the diseases of old age:

> You that would last long, list to my song,
> Make no more coil, but buy of this oil.
> Would you be ever fair and young?
> Stout of teeth, and strong of tongue?
> Tart of palate? quick of ear?
> Sharp of sight? of nostril clear?
> Moist of hand? and light of foot?
> Or, I will come nearer to it,
> Would you live free from all diseases?
> Do the act your mistress pleases;
> Yet fright all aches from your bones?
> Here's a medicine, for the nones. (I.ii.193-204)

Besides this scene, however, Jonson fills this comedy with the images of occult medicine and its supernatural effects. Disguised as an aging invalid, Volpone seduces legacy-hunters to surrender their own fortunes to him; however, the legitimately aged Corbaccio proves more susceptible to the disguise than most. He is easily fooled by the promise of that which he would wish for himself, rejuvenation, as Mosca observes:

> Nay, here was one,
> Is now gone home, that wishes to live longer!
> Feels not his gout, nor palsy; feigns himself
> Younger by scores of years, flatters his age
> With confident belying it, hopes he may,
> With charms, like Aeson, have his youth restored:
> And with these thoughts so battens, as if fate
> Would be as easily cheated on, as he,
> And all turns air! (I.iv.151-159)

When the lawyer Corvino bring his young wife Celia to comfort the supposedly dying Volpone, he is obeying a physician's orders for Shunamitism, the occult remedy derived from the Biblical account of King David, who revived his aged spirits by lying with a young woman name Abishag the Shunamite (1 Kings 1:1-4). When Volpone springs from bed, he mimes a miraculous age-reversal not otherwise

accomplished. Elsewhere Jonson equivocates the dominant symbol of avarice in the play, gold, and the *elixir vitae*. Perversely, gold imbues Volpone and Mosca with life, as Mosca slyly admits to Corbaccio, "This is true physic, this your sacred medicine, / No talk of *opiates*, to this great *elixir*" (I.iv.71-72).

In *Volpone* and *The Alchemist*, adepts are self-conscious deceivers, but Jonson also portrays them as over-credulous students who deceive their gulls only while deceiving themselves. *Mercury Vindicated* shows alchemy in both forms. On the one hand, alchemists are con-men who "pretend" expertise and stake out a "corner of the court to cozen in." The predominant imagery of fire and metal notwithstanding, the masque presents the medicinal arm of alchemy as perhaps its more seductive bait. The speaker Mercury depicts court alchemists as freeloaders who stay warm and fed by making—and receiving advance payments on—outrageous promises to butlers and cooks, the "underofficers" who work below stairs in noble homes. These promises include, of course, manufactured gold, but more copious are promises of a cure-all "quintessence," *aurum potabile*, and "Medea's kettle." Additionally, Mercury says, these alchemists dupe the ladies upstairs with the same temptation of the phoenix-like refreshment of their aging bodies (49-80).[10]

But court alchemists are also proselytes to an art with a cadre of special tools, procedures, and jargon. Their allegorical representative Cyclops insists upon the truth of alchemy while Mercury notes that all their aims rest upon a belief in nature's decay, a notion that Jonson disavows in *Timber*.[11] Depicting alchemy as an art, albeit, a false art, *Mercury Vindicated* underscores the links between its metal and vital sides but emphasizes the latter. The second Antimasque enlists "imperfect creatures" cooked out of limbecks (S.D.). These imperfect creatures are alchemical homunculi, or

[10] The text that I have used appears *Ben Jonson's Plays and Masques*, ed. Robert M. Adams (New York: W.W. Norton, 1979), 356-363.

[11] "I cannot think nature is so spent, and decayed, that she can bring forth nothing worth her former years. She is always the same, like herself: and when she collects her strength, is abler still. Men are decayed, and studies: she is not" (154-9). Linden (119, 315) sees a contradiction between this affirmation and a later one, "But it [lying] is the disease of the age: and no wonder if the world, growing old, begin to be infirm: old age itself is a disease" (369-371). However, the two statements do not clash as much as they may first seem. "Nature" and "the world" need not refer to the same thing; society, language, and manners may decay although nature does not. As Jonson says, "Men are decayed, and studies: she is not." In the second passage, Jonson suggests that civilization becomes more corrupt over time as it loses sight of the truth.

artificial humans. As the historian William R. Newman has written, although "tinkering with natural human generation" was a topic "widespread" among philosophers in the Middle Ages and early modern period, in the age of Jonson the project of fashioning artificial humans gained new vogue among alchemists. According to Newman, the advent of Paracelsian alchemy in the sixteenth century changed the tenor of scientific art-nature debates, for Paracelsians posited the homunculus as "the crowning piece of man's creative power, making its artificer a sort of demiurge on the level of a lesser god."[12]

In Jonson's masque, Mercury laments the tortures that he endures at the hands of alchemists who seek to control the life force in every way, not just to preserve it in living things but to fix it in inanimate ones too. The homunculus is a creature of the furnace, born of fire and chemical solution rather than "Sun and Nature" (142). In Mercury's words, though, the imperfect creatures emerging from the register are more deformed "than the very flies and insects that are her trespasses and 'scapes" (143-4). They are not artificial life, for the flies and insects mentioned are not living things either but metaphors for ash and soot. As Mercury says, "Paracelsus's man…never came to light" (110-112). Instead, the imperfect creatures are the parodic symbols of adepts and clients, the "creatures of art" tallied in Mercury's succeeding speech, the quarrelers, drunks, shysters, busy-bodies, and other riff-raff whom Jonson imagines as the only true products of alchemy (113-133). Real-life homunculi resemble Mosca, whose name means "fly," or any of Volpone's deformed children, such as Nano the dwarf, who embody the monstrosity of their father's soul. The masque hinges on Mercury's transmutation from quicksilver tortured in workshops to valid and natural

[12] William R. Newman, *Promethean Ambitions* (Chicago: University of Chicago Press, 2004), 165, 199. Paracelsus wrote a treatise titled *De homunculis*, considered genuine, which Newman discusses, 217-221. Jonson's phrase "Paracelsus's man" may indicate familiarity with it. Stanton Linden argues that Jonson's source is Michael Sendivogius's *Dialogus Mercurii, Alchymistae et Naturae* (Cologne, 1607) although the *Dialogus* cannot explain the masque's peculiar focus on "the great act of generation." Linden's argument (131-153) is not wholly convincing, anyway.

learning. Transmuted, he pledges allegiance to "the Majesty of this light"—who is at once King James, the Sun, Nature, and Christ—and banishes the "ridiculous monsters" from the court.[13]

As limned by Jonson, the alchemists who subscribe to occult learning and the gulls hoodwinked by the cozeners who do not are guilty of the same sin, which Mosca defines by devilish parody as the Christian virtue of hope.[14] Hope so pervades humanity that it is the trick of tricks, the self-willed deceit that suborns every ploy, whether artificial gold, legacies, fortune-telling, magical spirits, snake-oils, or the philosophical elixir. Mosca calls it "such a bait, it covers any hook" (I.iv.134-135). Hope induces the comic overreaching so often noted by readers of Jonson's plays, and it is responsible too for the downfall of its manipulators such as Volpone and Subtle, who explode their own schemes in fits of arrogance. This hope is the unreasonable expectation of metamorphoses, powers, and goods beyond what nature, especially human nature, permits. Alvin Kernan identifies its antidote as the brand of conservatism reinforced by almost all of Jonson's comedies, "a deep-rooted pessimism about the possibility of change and the potentialities of man…an understanding of the difficulty of changing anything very much, and the consequent sad necessity for compromise, adjustment, and the scaling down of ambition."[15]

One ambition reined by the alchemical dramas is the desire for abnormally long life. Volpone, Subtle, and the court alchemists solicit freaks from the ordinary courses of nature, either the permanent station of youthful vigor or the reversal of the debilities of old age. Such aberrations off nature's usual path entail the extension of the individual lifespan beyond what humans "naturally" obtain. Alchemists and their victims fail to see that length of life is a limited potentiality of man; it cannot be enlarged, because the process of senescence cannot be halted or reversed. The conventions of nature pose moral criteria, for it is foolish to strive for that which cannot be had. Jonson's

[13] The less obvious parallel with Christ is observed by Linden, 150. The first two performances of the masque occurred during the Christmas season, the same days as the Feasts of the Circumcision and the Epiphany.

[14] Of course, among early moderns, "hope" did not always carry a theological meaning, but the many inversions of language perpetrated by Volpone and Mosca raise the possibility that the bait of hope is a grotesque secularization of a spiritual value.

[15] Kernan, 7.

alchemical dramas enact the argument common among early moderns that the prolongation of life in the occult or Baconian sense should not be sought, because it is impossible.

The stability of natural terms is no clearer than in *Mercury Vindicated*. Mercury complains that his torturers commit "treason against nature." After the second antimasque, Nature appears and subjugates art. This scene is particularly evocative after reading Bacon, because to allegorize art Jonson employs the same mythic figure whom Bacon uses in *De Sapientia Veterum*, a work in which Bacon argues that the prolongation of life to extraordinary terms does not violate nature. At the feet of Nature obediently sits Prometheus. Although the masque gives no reason to suppose that Jonson responds directly to Bacon, he certainly engages the same art-nature debate that Bacon engaged six years prior. Jonson illustrates a conclusion that Bacon seeks to overturn: art must obey nature in its observable forms. As Nature, Prometheus, and the Chorus join their voices, Jonson poignantly puns on the word "form," which indicates the order of the dance, the external beauty of the noble ladies dancing, and, in Neoplatonic terms, the secret power of nature:

> *Cho.* Move, move again, in forms as heretofore.
> *Nat.* 'Tis form allures.
> Then move, the ladies here are store.
> *Pro.* Nature is Motion's mother, as she's yours.
> *Cho.* The spring whence order flows, that all directs,
> And knits the causes with the effects. (183-187)

Bacon might reply that, yes, the only way art can command nature is to obey her and that, yes, the forms of nature are ultimate, they just lie outside normal perception. Nevertheless, there is a fundamental disagreement here. Although Jonson preserves art, this tableau with its songs and dialogue restricts the hopes appropriate to art. Jonson seems not to admit as much natural mutability as Bacon envisions, certainly not as much as alchemists do, whose ambitions superficially resemble those of Bacon. The human lifespan is a stable form for Jonson. Like Spenser in the Aesculapius episode, he judges that it is a set feature of nature's decorum.

The constancy of the human lifespan renders attempts to overcome it at best foolish and at worst vicious although, to Jonson's mind, fatuity often amounts to vice. Because the alchemical

dramas confront prolongevity, the supposedly natural term of human life informs some of the moral choices of its characters, who strive to possess what nature will not yield. They want to coerce nature and compel it to their own desires. If Jonson is a Stoic, as some critics describe him, his alchemical dramas reveal at least one way the Stoic creed "to live according to nature" might pertain to longevity: one must accept the boundary of life laid down by nature for all mankind and never plan life as though one can surpass that marker or as though one can escape the decline of old age that, barring any other event, keeps it in place.

Elsewhere, though, Jonson points to a different challenge presented by the length or, perhaps more fitly, the brevity of life. Human finitude as a determinant of moral choice was an important subject to Jonson. It extended beyond his dramatic pieces into several lyrics.[16] These lyrics, unlike the dramas, are not concerned with prolongevity, however. In them, the mobility of human life's "natural" boundary is not at issue. Rather, the poems take for granted that the normal term of life is natural and yet imply that the ambition to fulfill it is, if not sinful or depraved, off the mark of the human good and even perhaps, paradoxically, unnatural.

The best-known of these, the Cary-Morison Ode, is also the most dynamic and therefore the one deserving greatest scrutiny. Although the Cary-Morison Ode may seem to ignore the parallel question of prolongevity, in fact, as I hope to demonstrate, it subtly invokes it but does so to suggest that the moral challenge of living within normal bounds is the same as the challenge living beyond them. The real danger of seeking longevity, according to the poem, lies not in transgressing a supposedly natural term of life (if that is even possible) but in forsaking virtue and good sense. The lure of a long life, whether inside or outside a perceived natural term, diverts the will from its proper object, wisdom and honor, to which length of life is an obstacle or, at best, an accident. After

[16] The lyrics I have in mind, besides the Cary-Morison Ode, are Epigrams XXXIV ("Of Death"), LXX ("To William Roe"), and LXXX ("Of Life and Death"); the ode "To Heaven" (*The Forest* XV); and his two translations of Martial (VIII.77 and X.47), the first in *Underwoods* and the second in his *Miscellaneous Poems*. There may be others.

exploring how Jonson conjures this Stoic notion, I wish to highlight a few ways in which the poem challenges it.

The immediate purpose of "To the Immortall Memory and Friendship of that Noble Pair, Sir Lucius Cary and Sir H.Morison" is to commemorate Henry Morison, who died at a young age in 1629, two years after he was knighted, and to assuage the grief of Morison's friend Lucius Cary, who would marry the dead man's sister, Lettice, the following year. Written shortly after Morison's death, the ode was composed almost two decades after the plays and masque discussed above, and it is generally considered the first "Pindaric" ode in English. Like Pindar's epinikean odes, it retains the tragic choral structure of triads comprising *strophe, antistrophe,* and *epode*, which Jonson translates as "Turn," "Counter-Turn," and "Stand," respectively, and it praises the men who are its subjects for their achievement.[17]

I shall return to its form later; for now, its content is more germane. The ode is suffused with a Stoic conceit, setting length of life in opposition to the good of life. Jonson's eulogy for Morison and consolation for Cary consist in large part of imaginatively reinforcing the point that Morison's untimely death warrants no grief because in his short life he nevertheless reached perfection, which is more than most people can say who live much longer. The conceit is not only Stoic, but, as John Hankin pointed out many years ago, it relies heavily on Seneca.[18] The Senecan idea most important here can be stated as a kind of paradox. This was not one of the traditional paradoxes taught by Stoics; nonetheless, Seneca recognizes its oddity when he espouses it in the *Epistulae Morales* and in *De Brevitate Vitae*, his epistolary essay that argues against expectation that life is long, not short.[19]

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[17] I do not wish to enter into the critical debate about whether and to what degree Jonson's poem is Pindaric. These are two basic resemblances. For an elaboration of the negative assessment, see Carol Maddison, *Apollo and the Nine* (Baltimore: Johns Hopkins University Press, 1960), 301-303. For a detailed defense of the opposite take, see Mary I. Oates, "Jonson's 'Ode Pindarick' and the Doctrine of Imitation," *Papers on Language and Literature* 11 (1975): 126-148. More recently, Jonathan Tuck has argued that Jonson's poem is surprisingly Horatian in its self-conscious sense of failure; see his "'Thou Fall'st, My Tongue': Success and Failure in the Cary-Morison Ode," *George Herbert Journal* 22 (1998): 77-93.

[18] John Hankin, "Jonson's 'Ode on Morison' and Seneca's *Epistulae Morales*," *Modern Language Notes* 51 (1936): 518-520.

[19] For Latin text and translation of this and other essays, I have used Seneca, *Moral Essays*, Vols. I-III, trans. John Basore (Cambridge, MA: Harvard University Press, 1932; reprint, 2001). *De Brevitate Vitae* appears at Vol. II, 286-355.

Fashioned as a paradox, the idea would run, "The wise man who dies in his youth lives longer than the ordinary man who dies in old age." In *De Brevitate Vitae*, Seneca comes closest to stating this point openly: "*Soli omnium otiosi sunt qui sapientiae vacant, soli vivunt*." He questions the conventional metric of life, time. He replaces that metric of simple duration with a metric of content or quality. Jonson's ode enforces a similar position. Its direct statement occurs three times:

> For, what is life, if measured by the space, / Not by the act? (21-2)
>
> ...thou hast been long, / Not lived. (58-9)
>
> In small proportions, we just beauties see:
> And in short measures, life may perfect be. (74)

As noted by Hankin, each of these three statements closely echoes lines from Seneca's Epistle 93:[20]

> *Actu illam [vitam] metiamur, non tempore*. (4)
>
> *Octoginta annis vixit. Immo octoginta annis fuit…* (4)
>
> *Quemadmodum in minore corporis habitu potest homo esse perfectus, sic et in minore temporis modo potest vita esse perfecta.* (7)

The second of these, with its quibble on the verb *vivere*, may be Seneca's favorite mode of expressing the paradox. There is living (*vivere*), and then there is merely existence (*esse*), or time (*tempus*). A few persons live; however, most just exist or pass time. Elsewhere in Epistle 93, he writes, "*Non vixit iste, sed in vita moratus est*" (3). *De Brevitate Vitae* contains a number of like usages. Besides the passage quoted above about only the wise truly living, Seneca confirms the profession of an oracle: "*Exigua pars est vitae, qua vivimus. Ceterum quidem omne spatium non vita sed tempus est*" (ii.2-3). And the work concludes with an execratory image aimed punitively at those persons who outlast in perpetual busyness: "*At me Hercules istorum funera, tamquam minimum vixerint, ad faces et cereos*

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[20] For the Latin text and translation of Seneca's epistles, I have used *Epistulae Morales*, Vols. I-III, trans. R.M. Gummere (Cambridge, MA: Harvard University Press, 1925). Epistle 93 appears at Vol. III, 3-11.

ducenda sunt" (xx.5). Such persons, however aged they may be at death, merit torches and candles lighting a nocturnal procession, because such are the funeral rites of children.

We may feel tempted to pass over the Senecan notion that life should be measured by its act rather than by its span as a truism that needs no explanation; however, in number of letters and essays Seneca supports it with an argument that is worth examining here, because Jonson inscribes the argument into his ode. What is so startling about Seneca's paradox of living is that it expresses not merely a preference for virtue over degeneracy or for activity over sloth but adds that to live virtuously is actually to live longer and in the end is more satisfying than spending a protracted and even pleasurable life. How can Seneca defend this claim?

His argument is complex, but it begins with the understanding of nature as an *artifex*, similar to Galen's understanding of nature discussed in Part One. Nature designs things toward an end, and the end of each thing is its good (*bonum*). We rate each thing by its fulfillment of the end "for which it is born and by which it is judged" (*cui nascitur, quo censetur*).[21] Like nature's other creatures, human beings have a peculiar *bonum*. That *bonum* goes under different names at different times when Seneca handles it, *honestum*, *virtus*, *ratio*, or *sapientia*. In Epistle 76, Seneca names reason (*ratio*) as humanity's peculiar good. *Ratio* distinguishes human beings from creatures lower in nature's hierarchy. All living things, even plants, have bodies. Other animals can move and sense. Only man has a reason greater than that of any animal but less than that of a god. Therefore, *ratio* is that for which we are born and by which we are judged:

> When this is right and has reached perfection, man's happiness is complete. Hence, if everything is praiseworthy [*laudabilis*] and has arrived at the end intended by its nature, when it has brought its peculiar good to perfection, and if man's peculiar good is reason; then, if a man has brought his reason to perfection, he is praiseworthy and has reached the end suited to his nature. This perfect reason [*ratio perfecta*] is called virtue [*virtus*], and is likewise that which is honorable [*honestum*]. (76.10)

"Living," when Seneca sets the word in pregnant contrast with "being," signifies this perfection of reason that is also virtue and nobility. In this sense, life is the fulfillment of the

[21] Epistle 76.8.

peculiarly human end, the completion of all that nature intends for us. It supersedes what we today might call the continuance of biological functioning. According to Seneca's paradox, anything less than the fullness of human purpose, such as life in the strictly existential sense, is not human life proper. Epistle 93, which seeks to console his friend Lucilius over the early death of the philosopher Metronax, renders this difference as the contrast between perfect life and imperfect age, a topos later exploited by Jonson. Whereas a man of eighty years may fill a large span of existence, Metronax

> departed in the bloom of his manhood [*viridis*]. But he had fulfilled all the duties of a good citizen, a good friend, a good son; in no respect had he fallen short. His age may have been incomplete, but his life was complete. (4)

When virtuously completed, life is also happy. As discussed in Chapter 8, Seneca and many other Stoics reason that life can be perfectly happy without possession of those "preferred" things (*potiora*) or "indifferent" things (*indifferentia*) for which mankind commonly clamors. Those things do not truly represent the good, which is single. Among the *indifferentia* is longevity.[22]

Seneca does not always uphold the paradoxical usage of the words "*vita*" and "*vivere*." The aberrations may also be revealing. In Epistle 58, which delves into natural philosophy and ontology, he associates life with *anima* but human or rational life with *animum*; human life builds upon the wider basis of *anima*. In Epistle 93, moreover, he uses a customary distinction in the sentence "*Et vixit et viguit*," pertaining to Metronax: "He has not only lived, but flourished" (5). The verb "*vigere*" connotes the intensification of mere living, the achievement of a latent potential. Its connotation is corporeal, suggesting the vigor marking the prime of life.

Recourse to Seneca, to whose ninety-third epistle Jonson alludes, helps us to understand a certain irony underpinning the natural imagery of his poem. This irony inheres in Seneca's paradox, and Jonson's adoption of it reveals both what is perhaps most Stoic about his ode and the troubles he has accepting all that the irony implies.

[22] For Seneca's discussion of *indifferentia* and *potiora*, especially in relation to health and strength of body, see *De Vita Beata* xxi.22. Seneca insists upon the singularity of the good in Epistle 76.6-7.

To communicate his paradox, Seneca relies upon impressions of natural order, of the development seen among sensible, growing things, to raise the imagination to a kind of perfection that is not so sensible. The growth of plants, animals, and even our own bodies limns nature's intentions; however, in our case, perfection occurs in that which cannot be seen or felt. Ultimately, the connection Seneca draws between the sensible and psychic worlds is ironic or self-consuming: the kind of perfection defining human life undermines the image that originally indicated and codified it. Though natural, it does not adhere to the course of sensible nature. It can arise well before our bodies perfect their natural terms.

Similarly, Jonson's ode enforces a transcendent ideal of perfection that is nonetheless natural; Susanne Woods calls it "transcendent fruition."[23] In the last chapter, I distinguished between the natural and transcendent ideals identified by J.A. Burrow. Jonson's poem offers an example of something that Burrow never notes. In fact, Jonson uses his imagery to insist upon a kind of perfection that, like Seneca's, is at once natural yet unnatural. The paradox turns on the difference between the natural end of virtue or wisdom and the natural motions of the body.

The latter play out in the kinetic and long-lasting "stirrer," an intensification of the foil that Seneca uses in Epistle 93, an inveterate, eighty-year-old "idler":

> Here's one outlived his peers,
> And told forth fourscore years;
> He vexèd time, and busied the whole state;
> Troubled both foes, and friends;
> But ever to no ends:
> What did this stirrer, but die late?
> How well at twenty had he fallen, or stood!
> For three of his four score, he did no good. (25-32)

In the next triad, Jonson contrasts the dual senses of the stirrer's "end"less motions—having no purpose and not stopping-point—with the "sphere" of perfection. Of Morison Jonson writes:

> He stood, a soldier to the last right end,
> A perfect patriot, and a noble friend,
> But most a virtuous son.

[23] Susanne Woods, "Ben Jonson's Cary-Morison Ode: Some Observations on Structure and Form," *Studies in English Literature* 18 (1978): 69.

All offices were done
By him, so ample, full, and round,
In weight, in measure, number, sound,
As though his age imperfect might appear,
His life was of humanity the sphere. (45-52)

The words "round" and "sphere," which develop the circle image used in reference to the infant of Saguntum ("How summed a circle didst thou leave mankind / Of deepest lore, could we the centre find!") evoke the Senecan ideal. "Circle," "sphere," and "round" call forth the classical idea of living perfection, which happens as something becomes over time what nature always intended for it to be. When summed, the circle is a traditional symbol of completeness, just as it is also a traditional symbol of self-directed motion, a kind of standing and revolving on an axis as opposed to a falling from the center:

Alas, but *Morison* fell young:
He never fell, thou fall'st my tongue.
He stood, a soldier to the last right end… (43-5)

As Mary Oates has noted, the Pindaric or tragic-choral structure of the ode also suborns the image.[24] The tragic chorus would dance in one direction while singing the *strophe* and in the opposite direction while singing the *antistrophe*, and then would stand in place for the *epode*. In the passage above, standing represents perfection; Morison did not fall but "stood."

The circle is, moreover, a symbol of eternity. The moral universes of Seneca and Jonson share a canon of fame whereby the achievement of the human good earns an afterlife in public memory. The lines in which Jonson claims that Morison "leapt the present age" and now "lives with memory" harkens back to Seneca's Epistle 93: "Why do you ask: 'How long did he live?' He still lives. At one bound he has passed over into posterity and has consigned himself to the guardianship of memory" (5).

Circles and spheres, however, are geometrical figures whose perfection the mind may see but which the eyes never observe. Unlike Spenser's *Fowre Hymnes*, the Cary-Morison Ode measures human perfection by nature although not by the nature of the body, which we share with other

[24] Oates, 132.

growing things, such as plants. Vegetation appears frequently in the poem, but the main irony impelling the ode's development is the use of such "natural" imagery to designate the cultivation of that part of ourselves that exercises choice. In the Stoic discourse that the poem evokes, this locus of choice is *anima*, the soul, a word that never appears in Jonson's ode, or *animus*, the mind, a word that does. It is "brave minds" that perceive greatness and good. Jonson deploys vegetative imagery in order to convey the sense of growth in that part of ourselves, soul or mind, that decides choice and action; like plants or trees, this part has an apex of maturity. Furthermore, as Seneca says, it determines the whole person as good or bad. The main thrust of the poem brackets out the body's development as a moral arbiter.

It does so by splitting nature between the inevitable processes of change and the "good" or "law" that guides human behavior. "Nature" represents both an aspect of the motion of life and the center around which the perfect life revolves. Keeping in mind perfection inherent in the image of the sphere, we notice this split irrupting at the end of the stanza quoted above:

> All offices were done
> By him, so ample, full, and round,
> In weight, in measure, number, sound,
> As though his age imperfect might appear,
> His life was of humanity the sphere. (48-52)

Having died young, Morison's "age" is "imperfect," yet its abbreviation does not prevent the perfection of his "life." In these last two lines we find the conceit upon which the whole poem hinges. They encapsulate the Senecan paradox of longevity. The perfection of "age," implied by the imperfection of Morison's, is personified in the stirrer who has accomplished eighty years. This perfection is the fulfillment of the term allowed by nature—or even of a term longer, much longer. I mentioned before that the poem subtly addresses the prospect of abnormal life extension; it does so in the analogy to trees in the subsequent turn:

> It is not growing like a tree
> In bulk, doth make man better bee ;
> Or, standing long an oak, three hundred year,
> To fall a log, at last, dry, bald, and sere. (65-68)

The simile of the three-hundred-year old oak censures dreams of prolongevity. Even living extraordinary lengths, Jonson says, will not make one "better." Fantasies about prolongevity miss the point of life, which is to seek and bring about the good in oneself. The other kind of natural perfection properly sizes up life:

> …her measures are, how well
> Each syllable answered, and was formed, how fair;
> These make the lines of life, and that's her air. (62-64)

As the images of circles and spheres suggest, the rule of life is aesthetic. It measures the amount of life that one lives not by time but by beauty, which emerges from the *ars vivendi* when one performs those actions that strike the interior sense with their fitness to what nature prescribes. Hence, this kind of perfection can occur in short time: "And in short measures, life may perfect be" (74).

Jonson's imagery emphasizes the naturalness of both sorts of perfection, using in fact the more familiar nature associated with growing things to substantiate the naturalness of praiseworthy action. Against the bulking tree and the elder oak, for example, Jonson counterpoises "the lily of a day" (69) as instance of perfection and beauty "in small proportions" (73). Although the lily does not last twenty-four hours, it is "the plant, and flower of light" (72). More revealing, however, is the comparison between the second and final Stands. In the former, Jonson pronounces,

> …for life doth her great actions spell,
> By what was done and wrought
> In season, and so brought
> To light… (59-62)

Great action is not only something experiencing birth, it has a fit season, which we might suppose corresponds to the age of the actor, as though a Morison or a Cary deserves praise because he fulfills the best that one might expect of youth. The next time seasonal imagery appears, however, it suggests that doing what is seasonable is somehow out of season:

> Of two so early men,
> Whose lines her rolls were, and records.
> Who, ere the first down bloomed on the chin,
> Had sowed these fruits, and got the harvest in. (125-128)

The men were "early." Before they had reached the age of maturity or manhood, designated by a beard, they had attained the pinnacle of virtue. Realization of the good, as Jonson would have it in this poem, does not require the fulfillment of the whole span of life that nature has provided or passage through all the stages of life that a person who does not die early might experience—a full youth, maturity, old age—but devotion to family, friends, and nation, which one might show at almost any age. What is more, those persons who, like Cary and Morison, deserve greatest fame and praise accomplish the good before we would expect other people to do it. The final lines hide an assumption that one hears, according to Burrow, with increasing frequency and assurance in the Renaissance, which is that the good of the soul need not and should not await the perfection of the body. Among the works of Jonson, the Cary-Morison Ode represents probably his most adamant assertion of the idea. Longevity has little or nothing to do with the good and in fact may obstruct it if the natural desire for pleasure—in Cicero's *De Finibus*, the sign of nature's most basic good, the preservation of the body—hampers its pursuit, which Jonson assumes to entail some kind of sacrifice. Great length of life, even a perfect age, adds no more good than does a brief one. The length of life and the goodness of life are different metrics.

The ode also represents, more generally, one of Jonson's most optimistic expressions of humankind's ability to reach perfection. According to William Drummond, Jonson chose as his impresa "a compass with one foot in the center, the other broken, the word, *Deest quod duceret orbem*."[25] Given the pessimism of his plays, critics sometimes interpret his emblem as a distillation of his general anthropology rather than as a statement about himself. This is not an unreasonable construction of the device, for accordingly the emblem intimates a view of humanity prevalent in Jonson's age. In fact, it relays much the same idea as Sidney's erected wit and infected will: human beings have the power to perceive the good but lack the force or purity of will to achieve it. They fail to trace out full lives centered on the moral intellect. With the examples of Cary and Morison, who

[25] In *The Complete Poems*, 477 (ll.598-599).

signify everything "perfect done" (115) and fill out the sphere of humanity, Jonson contradicts this macroscopic sense of his impresa.[26]

The Cary-Morison Ode insists that human perfection is attainable on earth. The final two lines of the poem, which I already have quoted, feature, in addition to the divergent natural trajectories of body and soul, the fulfillment of the latter: "Who, ere the first down bloomed on the chin, / Had sowed these fruits, and got the harvest in." Harvest, of course, is, like the circle, another traditional image of perfection. George Herbert, who, like Spenser, relegates human perfection to heaven, wrote a poem called "Home" that offers a provocative counterpoint to this final image:

> We talk of harvests; there are no such things,
> But when we leave our corn and hay:
> There is no fruitful yeare, but that which brings
> The last and lov'd, though dreadfull day. (55-58)[27]

Herbert's poem is interesting additionally, for it reframes an idea heard in the last lines of Martial's Epigram X.47 ("*Vitam quae faciunt beatiorem*"), which Jonson translated and supposedly liked to recite to William Drummond:

> The things that make the happier life, are these,
> Most pleasant Martial; substance got with ease,
> Not laboured for, but left thee by thy sire;
> A soil, not barren; a continual fire;
> Never at law; seldom in office gowned;
> A quiet mind; free powers; and body sound;
> A wise simplicity; friends alike-sated;
> Thy table without art, and easy-rated;
> Thy night not drunken, but from cares laid waste;
> No sour, or sullen bed-mate, yet chaste;
> Sleep, that will make the darkest hours swift-paced;
> Will to be, what thou art; and nothing more:
> Nor fear thy latest day, nor wish therefore.[28]

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[26] Another optimistic use of the compass image occurs in "An Epistle to Master John Selden" (31-34). "An Epistle answering to One that Asked to be Sealed of the Tribe of Ben" testifies to Jonson's own struggle to abide by his "center," which Jonson identifies with "heaven": "Live to that point I will, for which I am man / And dwell as in my centre, as I can, / Still looking to, and ever loving heaven" (59-61).

[27] *The Works*, 108.

[28] According to Drummond, Jonson already had translated this epigram by the time they met in 1618-9 (ll. 13-14).

The comparative *beatiorem* ("happier"), which Martial uses in the first line, fits with certain Stoic arguments of happiness whereby a happy life consists of virtue simply but a happier life, of preferred things additionally.[29] Instead of indifference, Herbert's verse teaches ambivalence toward death. It converts the sentence "Nor fear thy latest day, nor wish therefore" into the positive: one should fear death but also desire it. One should have two active but conflicted attitudes toward mortality, each respecting a different side of our beings, the spiritual, which longs for beatification in heaven, and the natural, which seeks preservation on earth. Harvest, however, clearly belongs to the spiritual and lies beyond earth.

So far, I have tried to demonstrate that the Cary-Morison Ode depicts through its geometric and vegetative imagery human perfection as a form of natural transcendence that has its source in the Stoicism to which several of its lines allude. Especially significant is the Stoic doctrine of natural reason. All the same, Jonson's ode obliquely divulges a few points of tension with Roman Stoicism or at least with the version espoused by the author most relevant here, Seneca. A couple of these points of tension reside in Seneca's philosophy itself, particularly in its demotion of longevity and bodily goods as immaterial to happiness or perfection. Jonson's immediate context and his Christianity, which is part of that context, emphasize them and introduce another point of tension as well.

The first of these is that some length of life is necessary to the development of virtue. Stoics, including Seneca, recognized this fact, as evident from the natural metaphor of "seeds of virtue" and "seeds of reason." These divine *semina* implanted in earthly flesh require time and nurture—a proper education—to flourish. Thus, as much as Seneca speaks of virtue and wisdom as irrevocable possessions, he also speaks of them as process.

Jonson conveys this need of maturity in a couple of ways. Literally, it appears as the "honest arts" that refine the "virtuous parts" that one has upon entrance into life. These arts require time to

[29] On the difference between the "happy" and the "happier" lives, according to Stoics, see Cicero, *De Finibus* V.80-83.

learn; for example, they occupied the antithetical "stirrer" for twenty years, the only quarter of his life in which he did any good.

More symbolically, it appears in the opening image of the infant of Saguntum. The story derives from the seventh book of Pliny's *Natural History* where it serves as an example of nature's prodigies and precedes by just a few paragraphs the collection of persons who achieved extraordinary longevity, a related set of monstrosities that, during the Renaissance, was a major source of information about length of life.[30] Not coincidentally, Jonson distills from the story a motto paraphrasing a remark that Pliny makes in the same book: "As, could they but life's miseries foresee, / No doubt all Infants would return like thee?" After recounting all the miseries confronting human beings, Pliny writes, "There have been many who believed that it were best not to be born, or to be put away as soon as possible."[31] Pliny's remark, however, is not associated with the infant of Saguntum; it applies to mankind generally and reiterates an ancient proverb also heard in Sophocles's *Oedipus at Colonus*.[32] Significantly, whereas the proverb probably registers the sense of life as an accumulation of misfortunes, personal loss, and physical pain—certainly the sense broadcast by Pliny and Oedipus—Jonson's imaging of it through the infant of Sagunutm situates it within a Stoic value system. The infant possesses a native sense of "shame, faith, honour, and regard of right," and when it realizes that it cannot enact or expect true virtue and right in the world, it essentially commits suicide.

Jonson casts doubts upon the decision of this infant whom he nonetheless dubs "wise." The word "clear" in the first line

> Brave infant of Saguntum, clear
> Thy coming forth in that great year,
> When prodigious Hannibal did crown
> His rage, with razing your immortal town. (1-4)

[30] Pliny, *Natural History, Books 3-7*, trans. H. Rackham (Cambridge, MA: Harvard University Press, 1947), 528-529. We should not assume that Jonson took this legend as fact; in an age of increasing skepticism about Pliny's histories he probably did not.

[31] *Multi extitere qui non nasci optimum censerent aut quam ocissime aboleri* (508-509).

[32] 1224-1228.

may be, rather than an adjective like the Latin *clarus* meaning famous, a verb: Jonson beseeches the infant to demystify his own example. He questions whether it was "wiser nature" that motivated its decision to retreat into the womb. The infant is juxtaposed with the long-lived stirrer and the true hero of the poem, Morison. Imaginatively, Jonson portrays this difference with the contrast between the "circle" of the infant and the larger "sphere" of Morison, which sums up humanity. Apart from both, the motions associated with the stirrer are not circular at all but alternately up and down: "got up," "advanced," and "flight" preceding "stooped," "sunk," and "deep," and both directional motions collected in the last moments of his life: "But that cork of title buoyed him up." At the extreme opposite to the stirrer who died "late," the infant of Saguntum died as soon as born, fulfilling the shortest lifespan that one can imagine, a "circle" so tightly "summed" that in truth it hardly counts as a circle. The problem with the infant's example, however, is not just with the size of the circle, which in Jonson's impresa of the broken compass signifies the course of life that one makes; the infant's life is drawn from a center unavailable to our natural selves.

As a mean between extremes, Morison outlived the infant of Saguntum yet, unlike the stirrer, died well before a degenerate old age and, as Jonson stresses in one of the best examples of epanorthosis in English literature, stood rather than fell. The mean he represents is not only good, it is available. Through Morison, Jonson implies that, although great and unusual longevity is not necessary to achieve the good, some modest length of life is. Best is to live toward the beauty of virtue. Although the infant's suicide intensifies the kind of self-negation exemplified by the sacrifice demanded of public service and friendship, it never knows what it is to live or die for the sake of others, and thus its suicide does not stem from the same root as Morison's duties. The admirable sort of self-negation can come only with a more rounded and sustained experience in society.

This brings up the third way in which Jonson emphasizes the need of virtue's maturation. This is the particular virtue he celebrates, friendship. In Seneca's ninety-third epistle, the friendship between Lucilius and Metronax serves as a pretext of discourse; it does not justify Metronax's

curtailed life or constitute a normative ideal. Furthermore, in *De Brevitate Vitae* when Seneca offers a normative virtue suited to the shortness of life, it is not friendship, but wisdom. Friendship may assist to wisdom, according to Seneca, but it seems not to be virtue, the good itself. Rather it is one of those "things to be preferred" when chance allows, a matter of fortune, not virtue. In fact, the kind of friendship that Seneca recommends to Paulinus in *De Brevitate Vitae* is that with the great thinkers of the past, whom one gets to know in solitary study while reading books.[33]

Jonson, by contrast, asserts the claim of friendship to "virtue." He praises Morison and Cary as a "fair example" and "law" of friendship whose real-life and perfect manifestation of an otherwise abstract form emboldens mankind to practice it. Extolling friendship as virtue and a keystone to human perfection, Jonson sounds less like Seneca and more like Aristotle in the *Nichomachean Ethics*, which views friendship as indispensable to virtue and happiness.[34] Yet in the ode Jonson implies that the human will benefits more from the image of men embodying virtue than it does from hearing virtue abstractly defined, a point common to Philip Sidney's *Defense of Poesy* (1595), except that, unlike Sidney's book, Jonson's poem locates the power of image in the living persons rather than in art: "*Friendship*, in deed, was written, not in words: / And with the heart, not pen" (123-124).

The hearts of Cary and Morison are yet like pens, and the predominant, graphical imagery of the final two stanzas convey the sense of friendship or perfection as process. Like the "sense" of language that Jonson separates from the word in *Timber*, the greatness and good that unite Cary and Morison are depicted as objects of mental perception. Their admiration for some third thing, which stands apart from them like some Platonic ideal, pulls them together. As Jonson apostrophizes the men,

> This made you first to know the why
> You liked, then after, to apply
> That liking… (107-109)

[33] *De Brevitate Vitae* xiv-xv.

[34] See Book 8, especially Chapter 1.

The virtue and very law of Friendship, however, are built from the ground up, as the subsequent lines show:

> …and approach so one the tother
> Till either grew a portion of the other:
> Each styled by his end,
> The copy of his friend. (109-112)

Friendship is an art but, most of all, an art akin to writing, as Jonson's image signifies. Although the greatness and good that base it stand immutable, friendship, like writing, discovers itself in time. In *Timber*, Jonson stresses that every poet requires exercise, imitation, and study beyond native wit, just as every poem requires polish beyond its bare conceit.[35] By copying and revising each other, Cary and Morison raise one another into the perfection that they come to embody.

The verb "embody," however, is not quite right. Cary and Morison do not instantiate an ethereal virtue; they *are* the virtue. The way their friendship may most resemble a poem or other work of art is that its perfection does not conform to an abstract image. There is not a form "Poem" that all poems strive to become. Rather poems have their peculiar perfections. As Jonson affirms in *Timber*, "I am not of that opinion to conclude a poet's liberty within the narrow limits of laws, which either the grammarians, or philosophers prescribe. For, before they found out those laws, there were many excellent poets, that fulfilled them."[36]

In comparison with the law of Friendship created by Cary and Morison, the image of the Saguntum infant resonates differently. Through the infant, Jonson expresses a kind of transcendental dejection while through Cary and Morison he express a preference for a worldly, militant good. Readers of the ode often observe that its very pagan and secular frame of reference shifts to Christian in the third triad when Jonson envisions Morison in heaven; however, his skepticism toward the infant indicates that the poem opens with that frame of reference. Stoic injunctions toward suicide on the grounds that the infant chooses—the inability to participate in virtue—were anathema to much

[35] Ll. 2986-3109

[36] Ll. 3163-3166

Christian teaching. Augustine opposed the two sets of belief over the issue of suicide. In Book I of *The Faerie Queene*, the allegorical character Despayr partly employs the logic of Stoicism to tempt Redcrosse Knight to murder himself before Una intervenes. Similarly, in *A Discourse of Life and Death*, a *contemptus mundi* patterned on Seneca's epistles and stocked with their *sententiae*, the Protestant Philiip de Mornay inventories a morass of defeated hopes, constant pains, and worldly illusions, only to warn readers in the final page not to infer that the misery and vanity of the world justify suicide, the result of sinful despair.[37]

From such a perspective, the infant acts out of despair, yet with its example Jonson does not simply refute older, pagan beliefs with newer, Christian truth. The infant is still somehow "wise" and normative. It reminds us of the loftier virtues and happiness available in heaven. This "wise child" has a preternatural sense of virtue and, with miraculous clairvoyance, foresees the miseries in store for it in a shattered world where such virtues have no place. Does its keen and marvelous perception arise from its newness? Perhaps. George Herbert's "Holy Baptism (2)," venerates infancy as the purest time of mortal existence, before the body, portrayed as an almost inexorably swelling cancer, poisons its "sister" soul. It concludes, "The growth of flesh is but a blister; / Childhood is health" (14-15).[38] This religious commonplace of infant purity and mature corruption suffuses Henry Vaughan's "The Retreat," where it affects thought in a way perhaps relevant to the Cary-Morison Ode:

> Happy those early dayes! when I
> Shin'd in my Angell-infancy!
> Before I understood this place
> Appointed for my second race,
> Or taught my soul to fancy ought
> But a white, Celestiall thought. (1-6)[39]

[37] Philippe de Mornay du Plessis-Marly, *A Discourse of Life and Death*, trans. Mary Sidney Herbert, Countess of Pembroke (London: 1592). This text is discussed in Chapter 9.

[38] *The Works of George Herbert*, ed. F.E. Hutchinson (Oxford: The Clarendon Press, 1945), 44.

[39] *The Complete Poetry of Henry Vaughan*, ed. French Fogle (New York: W.W. Norton, 1964), 169.

Although extracted from a classical, secular tradition, the story of the Saguntum infant as told by Jonson may have registered in the minds of his original audience the tension between what Vaughan calls the "white, celestial thought" of heaven and the prudence appropriate to a fallen world. Set beside the purity of divine right and good, human virtue appears like misery, as the fallen world as a whole appears like "trampled" Saguntum. So Vaughan's infant self may have compared them, could it have foreseen the sins and ever-"forward" propulsion of his second race. So the brave and wise infant of Saguntum may compare them before its "retreat" into the womb: in comparison, worldly life is harvestless.

This introductory image offers Jonson the device by which to show an idea expressed more amply by Thomas Browne in *Religio Medici*. Although Browne condemns suicide a few pages later, exalting the courage of Job over the "fear" of Cato, he confesses that the "conceit" of some better way of existence often drags him close to suicidal despair:

> When I take a full view and circle of my selfe, without this reasonable moderator, and equall piece of justice, Death, I doe conceive my selfe the miserablest person extant; were there not another life that I hope for, all the vanities of this world should not intreat a moments breath from me; could the Devill worke my beliefe to imagine I could ever dye, I would not out-live that very thought; I have so abject a conceit of this common way of existence, this retaining to the Sunne and Elements, I cannot thinke this is to be a man, or to live according to the dignitie of humanity; in expectation of a better, I can with patience embrace this life, yet in my best meditations doe often defie death; I honour any man that contemns it, nor can I highly love any that is afraid of it; this makes me naturally love a Souldier, and honor those tattered and contemptible regiments, that will die at the command of a Sergeant. For a pagan there may be some motives to be in love with life, but for a Christian to be amazed at death, I see not how he can escape this dilemma—that he is too sensible of this life, or hopeless of the life to come.[40]

The Saguntum infant retreats because it can see no opportunity in the world to practice true virtue and right, which, as Jonson muses, undoubtedly all innocents would do if they could know in advance the miseries of the world—knowledge that, he says, they cannot have. After this otherworldly and miraculous opening, the poem downshifts to nature, and in the world that an infant comes to occupy, the best spirits remain in life partly for the reason that Browne denominates, heaven, and partly for the reason that pagans recognized, fame.

[40] *Sir Thomas Browne:The Major Works*, ed. C.A. Patrides (New York: Penguin, 1977), 109.

Of the two, fame receives the larger treatment, the whole poem being an act of "memory." The addition of fame validates the natural standard of perfection, and subtly it does so over and against the conception of an otherworldly standard of perfection that is locked away in heaven. While white, celestial thoughts may stand on some higher plain, our awareness of them need not pose the "dilemma" that Browne takes as a sign of a true, militant Christian, because the standard of nature has its own legitimacy and may communicate or fuse with the heavenly standard better than poets such as Spenser or Herbert imagine. After all, the poet as a type, who serves fame, is also the priest who conjoins earth and heaven. The infant of Saguntum may abort itself, but the disdain roused by heavenly perfection does not nullify the perfection of nature—far from it. Friendship moves the heart not despite but because of the limitations of the material out of which it arises.

"Honest arts," the distrust over the Saguntum infant's precipitous self-destruction, and the motif of friendship as an artistic process all quietly disclose the linkages between body and soul. As the Cary-Morison Ode champions a virtuous ideal that emerges from but transcends nature, it evinces concerns about the limitations of nature that might still cling to the ideal. The three elements just mentioned are alike in that they trace limits in place as virtue develops and as the body grows; in sum, they implicitly undercut the Stoic conceit at the poem's core, intimating that the robust virtue appropriate to human life, friendship, needs time. Longevity understood as living deep into old age may be extraneous to the good of life, but time is not.

The ode, however, shows an even more intense concern over what happens post-perfection, when virtue is lost and when the body declines. The loss of virtue occurs with the death of Morison. But, as Jonson replies, Morison is not truly dead if he dwells in heaven, just as the virtue of Friendship does not expire as long as Morison and Cary dwell in the minds of men. Consoling Cary, Jonson once again challenges the Stoicism that his poem summons. Seneca teaches the duty of suicide in the event that one loses the capacity for virtue, a notion imaged not only in the Saguntum infant but also in Lucretius's famous analogy of life as a feast that one should depart at the right time. Jonson's charge in the third counter-turn echoes Lucretius's image:

Call, noble Lucius, then for wine,
And let thy looks with gladness shine:
Accept this garland, plant it on thy head,
And think, nay know, thy Morison's not dead. (75-78)

Jonson enjoins Cary to remain at the feast. Epideictic and consolatory at once, the ode divides its powers like the twin Dioscuri whom it invokes, enrolling into fame's records the departed but succoring the friend left behind, whom it charges with the duty of endurance:

Where it were friendships schism,
(Were not his Lucius long with us to tarry)
To separate these twi-
Lights, the Dioscuri;
And keep the one half from his Harry.
But fate doth so alternate the design,
Whilst that in heaven, this light on earth must shine. (90-6)

About these lines critics often note the changes they work upon traditional stories of Castor and Pollux, but line 96 also deserves scrutiny. Not only does the word "light," whose Latin form "lux" yields the name "Lucius," enfold the connection between Cary and his bright fame, the modal verb "must," stated in the independent clause but also understood in the dependent, aligns each Englishman with a mythical counterpart. In Pindar's *Nemean* 10, a probable influence on Jonson's poem, the mortal Castor dies while the immortal Polydeuces voluntarily cedes half his immortality to his beloved brother.[41] If we think about it, the "must" in Jonson's line carries dual senses of obligation. Morison must reside in heaven, like the mortal Castor, because the necessity of death cannot be overcome. Cary, however, has a choice; he may leave earth if he desires: he can take his own life. Perhaps he will not reach heaven and return to Morison if he does, but, like Polydeuces, he has options. His options invert those of Polydeuces; they are what to do with an immortal life, not a mortal one. Rather than the ineluctable force of nature, the "must" for Cary is the directive of God. One of the most Christian elements of the poem is the word "must." God calls upon Cary to remain on earth as a living beacon of that paradigmatic and regulatory friendship that he helped fashion.

[41] Ll. 38-91. Pindar, *Nemean Odes, Isthmian Odes, Fragments*, ed. and trans. William H. Race (Cambridge: Harvard University Press, 1997), 106-121.

Jonson transmits the order: "And shine as you exalted are; / Two names of friendship but one star" (97-8).

The decline of old age appears in three images of the poem that reflect upon Jonson himself as writer of the ode. It is hard to read the following lines without imagining Jonson, the aging dramatist, scolding himself:

> Go now, and tell out days summed up with fears,
> And make them years;
> Produce thy masse of miseries on the stage,
> To swell thine age;
> Repeat of things a throng,
> To shew thou hast been long,
> Not lived… (53-64)[42]

Secondly, because of Jonson's physical portliness, and because the year before the death of Morison he suffered a paralytic stroke at the age of fifty-six, some readers have noted that the bulking tree and the oak "dry, bald, and sere" depicted in the next stanza resemble Jonson himself.[43] The dramatist and trees are his metaphorical intrusions before his name irrupts between the counter-turn and stand of the third triad. In the words of another poet, the ode engages the problem of what to do with a diminished thing. After one achieves the good, one does not always die. Rather one may continue, as Cary persists after his friendship has ended, while nature drives on age.

And old age is an ugly thing, according to Jonson. The great advocate of healthy, vigorous senescence Luigi Cornaro complains bitterly about those who conceive old age as dead, not vivacious.[44] Jonson, though, seems to be one of them. The images of the dramatist and the oak are unqualifiedly bleak: the one has nothing to mimic but "fears" and "miseries," and the other has nothing left to do but rot and "fall." What is more, Jonson takes the eighty-year-old "idler" whom

[42] As noted by Ian Donaldson, "Jonson's Ode to Sir Lucius Cary and Sir. H. Morison," *Studies in the Literary Imagination* 6 (1973): 147; and Richard Peterson, *Imitation and Praise in the Poems of Ben Jonson* (New Haven, CT: Yale University Press, 1981), 211.

[43] For example, see Tuck, 88.

[44] Luigi Cornaro, *The Art of Living Long*, trans. William F. Butler (New York: Springer Publishing, 2005), 20.

Seneca in Epistle 93 sets in antithesis to Metronax and transforms him into the eighty-year-old "stirrer," a positive blight.

Of course, we cannot take what Jonson says about old age in this ode as his comprehensive view although in *Timber* he writes, "Old age itself is a disease."[45] The ode has the rhetorical purposes of praising a man who has died young and of consoling his friend. Demeaning the beneficiaries of long life is part of its strategy, and reminding Cary that Morison could have survived into a vital and virtuous old age would undermine the strategy. For a consolatory panegyric, however, Jonson could have taken a different tack: he could have bemoaned the unfair and unpredictable way of things which would rob the world of a paragon of virtue who could have thrived and served many years more while others who do much less good remain behind. This reaction is apparently that which Lucilius sought from Seneca upon the death of Metronax and, as Seneca says, represents a common way survivors grieve:

> While reading the letter in which you were lamenting the death of the philosopher Metronax as if he might have, and indeed ought to have, lived longer, I missed the spirit of fairness which abounds in all your discussions concerning men and things, but is lacking when you approach one single subject—as is indeed the case with us all. (1)[46]

This sense of unfairness could form the basis of commiseration. But Jonson strives for something else. Above consoling grief and praising the dead, he wishes, like Seneca, to preserve the providence of nature. In another epistle, Seneca argues that goodness could not exist without finitude; the desire for bodily immortality, which demotes the good to feeling, makes chaos out of nature. A moral life, however, necessitates the accomplishment of an end point.[47] Jonson's metaphors of life as art and poetry perform this Senecan restriction of the good. Life may be perfect in small measures because the good is a matter of beauty rather than sensuality.

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[45] Line 371.

[46] *In epistula, qua de morte Metronactis philosophi querebaris tamquam et potuisset diutius vivere et debuisset, aequitatem tuam desideravi, quae tibi in omni persona, in omni negotio superest, in una re deest, in qua omnibus*.

[47] Epistle 76.24.

Abetting this restriction is profound doubt, perceptible in the images of the stirrer, the aged dramatist, and the rotting oak, about the possibility of a happy and active old age. The trees reiterate the vegetative imagery that I discussed earlier; Jonson uses them to show that nature veers from the perfection of virtue, symbolized by the lily:

> It is not growing like a tree
> In bulk, doth make man better bee;
> Or, standing long an oak, three hundred year,
> To fall a log, at last, dry, bald, and sere:
> A lily of a day
> Is fairer far, in May,
> Although it fall, and die that night;
> It was the plant, and flower of light. (65-74)

It may not be immediately noticed here that the two trees contrast with the lily on opposite side of its life's arc. The first tree off-sets the lily's rapid growth into beauty ("of a day"), whereas the oak off-sets its rapid decay from beauty. Jonson favors the lily not only for its sudden and brief achievement of perfection but also for the way it declines from perfection. The oak "stand[s]" for three hundred years—a twist on the important verb associated with Morison, who did not fall but stood: "to stand" may mean, besides holding to one's moral center, lingering inactively. Standing long, the oak dries and weakens before it falls a log. The lily, by contrast, springs up in a day and dies in a night. Its fall occurs "that night." In addition to speed, its decline possesses invisibility. With the lily, Jonson conveys apprehension about seeing the deterioration of old age. Although it, like the oak, "fall[s]" and dies, Jonson refrains from describing its rot, the noxious deterioration of which Shakespeare speaks in Sonnet 94: "Lilies that fester smell far worse than weeds." Instead, Jonson displaces its decay and death to invisible night.

As a vegetative image, the oak signifies more clearly than do the other pejorative images of old age the decline of the body. The inevitability of the body's decay and of the misery and impotence entailed by it reinforce nature's rule of beauty. As Jonson implies, the growth, stasis, and decline of natural things instruct us to measure life by the mere attainment of perfection, not by the

duration of perfection, even though it is also nature that determines different periods of stasis appropriate to different species, as the comparison of the lily and the oak demonstrates.

The comparison also intimates that, by nature's design, the body puts human perfection in jeopardy. This danger is something that Seneca recognized as well, old age being the last and unavoidable cause of incapacity for virtue and wisdom.[48] Jonson, though, lacks the resource advocated by Seneca in the event of senile debility: suicide, which enacts the Stoic indifference to longevity and bodily goods. Subtly, Jonson attempts to identify with Cary through their parallel conditions. As Cary suffers the loss of his friend, so Jonson suffers the devastations wrought by his body's procession toward death. We see the parallel first in the thin metaphorical guises that Jonson assumes as a dramatist swelling with fears and miseries and as trees bulking and withering with age, but it comes across more palpably when Jonson inserts himself between Cary and heaven:

> He leapt the present age,
> Possessed with holy rage,
> To see that bright eternal day:
> Of which we priests, and poets say
> Such truths, as we expect for happy men,
> And there he lives with memory: and Ben
>
> THE STAND
> Jonson! Who sung this of him, ere he went
> Himself to rest,
> Or taste a part of that full joy he meant
> To have expressed,
> In this bright asterism. (79-89)

He speaks of himself as already dead. He already "lives" with Morison in heaven, and both he and Morison now belong with memory. The relative clause "Who sung this of him, ere he went / Himself to rest," with its principal verb in the past tense, makes the ode itself ("this bright asterism") sound like the last words of a dead man.

Although his self-insertion borders on the bathic, the intensity with which Jonson wishes to prove something about himself is no less real. Perhaps the most traumatic fear that Jonson suffered about an imminent or present dotage is that reflected by the ode, which is essentially the same as that

[48] Epistle 58.32-36.

registered by George Herbert's "The Forerunners," the fear of his poetic talent's diffusion. When recording his thoughts in *Timber*, Jonson notes that since turning forty he has felt a decline in his powers of memory, "the first of our faculties, that age invades" (594-5). Sometime later he suffered the stroke that left him bed-ridden. A year after that, London theater-goers repulsed his play *The New Inn*. This, of course, was the same year in which Morison died. The "Ode to Himself," written upon the play's failure, expresses Jonson's worry that his poetic star is on the wane, that, as a poet, he has something more to prove and must rush to do so before more debilities of old age overtake him. The "Ode to Himself" bitterly inveighs against the bestial sensibilities of the public and the playwrights who cater to those sensibilities, such as Shakespeare. Jonson's solution is to abjure the stage and instead write less commercial forms:

> Leave things so prostitute,
> And take the Alcaic lute;
> Or thine own Horace or Anacreon's lyre;
> Warm thee by Pindar's fire:
> And though thy nerves be shrunk, and blood be cold,
> Ere years have made thee old,
> Strike that disdainful heat
> Throughout, to their defeat:
> As curious fools, and envious of thy strain,
> May, blushing, swear no palsy's in thy brain. (41-50)

In reality, Jonson did not fulfill the first half of this promise. Living another eight years, he saw through two more dramatic productions and almost completed writing a third. Undercutting the authority of his forecast, his relapse to the theater had precedent. A previous "Ode to Himself" repudiating the theater succeeded *Sejanus, His Fall*. Similarly, there is something cockeyed about the second half of his promise. A theatrical audience that has no better appetite than "swine" (20) comprises the same "curious fools" whom he wants to astound with erudite lyrics. His project, even if carried through, appears doomed to fail.

Despite these contradictions, Jonson did discharge something of what he vouched: he capitalized on classical lyric forms. The models that Jonson summons—Alcaeus, Horace, Anacreon,

and Pindar—are all classical lyricists, and, formally at least, the Cary-Morison Ode fulfills Jonson's express vow to absorb the warmth of "Pindar's fire."

But this warmth is also to restore Jonson's poetic vigor. His blood is "cold" with age. According to the "Ode to Himself," the lyrics he pens will simultaneously rejuvenate him and testify to an imaginative strength ever-present. Jonson sees the Cary-Morison Ode as performing this function, which is what gives his self-insertion its pathos. Although longevity of life threatens Jonson with debilities of old age—evident to Thomas Carew and others in *The New Inn*—it also offers the opportunity for redemption. In this way, the Cary-Morison Ode is a secular, earthly, and artistic parody of the process of sanctification discussed in the previous chapter. For Jonson, the continuance of life brings with it the almost sacred duty but also the welcome chance to craft a poem that may surpass efforts that have come before as well as inspire those who read it.

So doing, it performs a kind of alchemy. I began this chapter discussing Jonson's alchemical dramas; fittingly, I would like to close by noting how Jonson's poetic strategy in the Cary-Morison Ode, which ostensibly disdains long life, resembles the alchemists of his earlier dramas. As one of their most reviled attributes, Jonson's alchemists share a pretense of superiority based on specialized knowledge and cant deracinated from nature and custom. They also use the allure of special greatness to bait their victims. Volpone, for instance, wheedles the crowd in St. Mark's by claiming to have sold large quantities of his "precious liquor" to "gentlemen of your city; strangers of the Terra Firma; worshipful merchants; ay, and senators, too" (II.ii77-78).

A similar division between the privileged and the ordinary is at work in Jonson's rejuvenation by the lyric form. Poetic rejuvenation works, according to him, by exchanging one kind of life-force for another. As he explains in *Timber*, comedy derives its power from popular taste, which, in turn, relishes novelty:

> Expectation of the vulgar is more drawn, and held with newness, than goodness; we see it in fencers, in players, in poets, in preachers, in all, where fame promiseth any thing; so it be new, though never so naught, and depraved, they run to it, and are taken. Which shows, that

> the only decay, or hurt of the best men's reputation with the people, is, their wits have outlived the peoples palates. They have been too much, or too long a feast.[49]

Once again, Jonson employs the Lucretian metaphor of the "feast." Departure from the theater, or from commercial projects more generally, amounts to a kind of self-willed death. In the Cary-Morison Ode, when Jonson commands "noble Lucius" to prolong the feast, he also commits himself to a poetic life of a new order. His former life was always limited, almost destined to be overshot, because of its devotion to newness. Newness corresponds to the mutable shapes taken on by lies, which, as Jonson says in *Timber*, can preserve themselves only by changing so much that they cease to be what they are. He quotes Euripides: "No lie ever grows old." Conversely, to achieve immortality, writing must be imbued with "truth," the only thing permanent.[50] The "sense" of language, as Jonson comments elsewhere, is its "life and soul," yet sense derives from "the liberal arts"; only the words are "the people's."[51] By his patrician standards of art, truth has a sameness to it that sustains learned tradition, and truth cannot be seen by everyone.

Tightly crafted and classically allusive, the Pindaric ode taps into tradition while also, according to Jonson, confounding the multitude. In the "Ode to Himself," the presence of shrunken nerves and chilled blood as well as the forethought of himself almost grown old raise the possibility that Jonson wants to contract the size of his works to accommodate his shrinking powers. Generally, though, his poetic theory assumes greater labor in compact, polished verse than in expansive—the Callimachean ideal. An appreciation for finely wrought but brief poetry helps raise the cultured few above the ignorant many:

> Indeed, the multitude commend writers, as they do fencers, or wrestlers; who if they come in robustiously, and put for it, with a deal of violence, are received for the braver fellows*:* when many times their own rudeness is a cause of their disgrace; and a slight touch of their adversary, gives all that boisterous force the foil. But in these things, the unskilfull are naturally deceived, and judging wholly by the bulk, think rude things greater then polished; and scattered more numerous, than composed: nor think this only to be true in the sordid

[49] Ll. 500-509

[50] Ll. 659-673.

[51] Ll. 2334-2340.

> multitude but the neater sort of our gallants: for all are the multitude; only they differ in clothes, not in judgment or understanding.[52]

The elixir of poetic life is the tradition of the skillful, a learned elite. Its taste is for art that voids the living pageantry of changing appearances and concentrates, like some alchemist searching for the quintessence, on the eternal power that drives all. The last sentence above, which partly repeats the final sentence of Jonson's preface to *The Alchemist*, completes the analogy between life and writing heard in the Cary-Morison Ode.[53] The "unskilfull" favor the bulky over the polished and composed, just as they prefer longevity over the good. From Jonson's perspective, the strange form of his Pindaric ode may fit uniquely well its content, which celebrates a virtue that only the few recognize and spurns a value that the many share.

[52] Ll. 794-801.

[53] "For it is only the disease of the unskilful, to think rude things greater than polished; or scattered more numerous than composed" (228).

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