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Nature and Man in the Works of Francis Bacon

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Francis Bacon inaugurates a new science with a new aim, to master nature for the relief of man's estate. The new goal of his new science is bound up with a new account of nature, man, and the relation between them. Yet Bacon nowhere expressly defines these most important terms, *nature* and *man*. So here I ask, what is nature such that man can master it, and what is man such that he can master nature?

To bring Bacon's idea of nature to light, I have had to give an unorthodox account of its genesis. Instead of looking for Bacon's idea of nature in his "eclectic" speculative philosophy, I have looked for it in his critiques, especially what I call his *prudential* critique, of the philosophical and biblical traditions. The idea of nature I uncover is not the discovery of his method, but rather the idea of nature that method presupposes.

I draw out Bacon's idea of nature from his critiques of the old science's starting point, order of demonstration, and end. In place of the old philosophy's starting point in ordinary experience, Bacon's new science is grounded in an artificially constructed experience. In place of the forms that were real principles of both knowledge and being, Bacon's new science seeks knowledge of non-ultimate, "methodological" principles, forms or laws that make possible a rapprochement between knowledge and power. In place of the more-than-human contemplative goal of ancient philosophy, Bacon's new way of contemplation strives to make man a powerful and benevolent god without making him any less a man.

These critiques point to an idea of nature that is the negation of what Bacon takes to be the Socratic-Aristotelian idea of nature. Nature itself, *natura naturans*, is a plenipotential source of power

ungoverned by final causes. What nature is in itself, we cannot know and cannot alter. The species or kinds we encounter in ordinary experience—*natura naturata*—are only one of nature's many possibilities, nature's deep-rutted ways or the mask nature habitually wears. But with the right helps and aids, we have the power to force nature—human nature included—into new shapes, to bring about “a kind of alternative universe or theatre of things.”

This dissertation by Nicholas Anthony Kruckenberg fulfills the dissertation requirement for the doctoral degree in Philosophy, approved by John McCarthy, Ph.D., as Director, and by Richard Hassing, Ph.D., and Michael Rohlf, Ph.D., as Readers.

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References and Abbreviations

In quoting Francis Bacon's writings, I will use principally *The Oxford Francis Bacon* (OFB) texts and translations. For writings included in as-yet unpublished volumes of the OFB, I will use the London printing of *The Works of Francis Bacon* (SEH), edited by James Spedding, Robert Leslie Ellis, and Douglas Denon Heath. Additionally, I will use Benjamin Farrington's translations (F) of certain early works. Citations will indicate the work, part of work, or plan and any book, section, or aphorism numbers before noting the volume and page number, enclosed in parentheses and separated by a comma, in the OFB, SEH, or F.

Following the conventions established by the editors of *The Oxford Francis Bacon*, I will use the following abbreviations for the titles of Bacon's works, parts of works, and plans:

| | |
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| AHW | <i>Advertisement touching an holy war</i> |
| AL | <i>Advancement of Learning</i> |
| ANN | <i>Abecedarium nouum naturæ</i> |
| CDNR | <i>Cogitationes de natura rerum</i> |
| CDSH | <i>Cogitationes de scientia humana</i> |
| CHP | <i>Catalogus historiarum particularium</i> (in IM) |
| CV | <i>Cogitata et visa de interpretatione naturæ</i> |
| DAS | <i>De augmentis scientiarum</i> |
| DFRM | <i>De fluxu et refluxu maris</i> |
| DGI | <i>Descriptio globi intellectualis</i> |
| DIN | <i>De interpretatione naturæ sententiæ xii</i> |
| DO | <i>Distributio operis</i> |
| DPAO | <i>De principiis atque originibus</i> |
| DSV | <i>De sapientia veterum</i> |
| DVM | <i>De vijs mortis</i> |
| Ess | <i>Essayes</i> (1625) |
| HDR | <i>Historia densi & rari</i> |
| HGL | <i>Historia gravis & lenis</i> |
| HNE | <i>Historia naturalis et experimentalis</i> |
| HV | <i>Historia ventorum</i> |
| HVM | <i>Historia vitæ et mortis</i> |
| IM | <i>Instauratio magna</i> |
| NA | <i>New Atlantis</i> |
| NO | <i>Novum organum</i> |
| PA | <i>Prodromi sive anticipationes philosophiæ secundæ</i> |
| PAH | <i>Parasceve ad historiam naturalem</i> |
| PbU | <i>Phænomena universi</i> |
| PID | <i>Partis instaurationis secundæ delineatio & argumentum</i> |
| RPh | <i>Redargutio philosophiarum</i> |
| SI | <i>Scala intellectus sive filum labyrinthi</i> |
| SS | <i>Sylva sylvarum</i> |
| TMP | <i>Temporis partus masculus</i> |
| VT | <i>Valerius terminus of the interpretation of nature</i> |

Introduction

Nature, Man, and Mastery

Francis Bacon inaugurates a new science with a new aim, to master nature. Before him, hardly anyone believed that man could or ought to master nature. After Bacon, the mastery of nature quickly became a central goal of the prevailing philosophical and scientific program. He is the fulcrum, the turning point, or near enough.

Science's new goal is bound up with a new account of nature. Nature is no longer a beautiful cosmos or God's very good creation. Instead, "Conquest of nature implies that nature is the enemy, a chaos to be reduced to order; everything good is due to man's labor rather than to nature's gift."¹ This is the idea of nature that convinces Hobbes that man's good depends on escaping his natural condition by creating an artificial state.² This is the idea of nature that emboldens Locke to credit nature for only one one-hundredth of what man enjoys.³ And this is the idea of nature that Rousseau repudiates when he doubts that the arts and sciences have led to moral progress or complains that man "wants nothing as nature made it, not even man."⁴

This is the new idea of nature that I will try to explain in the following pages.

¹ Leo Strauss, "Three Waves of Modernity," in *An Introduction to Political Philosophy: Ten Essays by Leo Strauss*, ed. Hilail Gildin (Detroit: Wayne State University Press, 1989), 88.

² See, for example, Thomas Hobbes's introduction to *Leviathan*, ed. C. B. MacPherson (New York: Penguin, 1981).

³ John Locke, *Second Treatise of Government*, ed. C. B. MacPherson (Indianapolis: Hackett, 1980), §§37 and 42.

⁴ Jean-Jacque Rousseau, *Emile, Or On Education*, tr. Allan Bloom (New York: Basic Books, 1979), 37.

My Questions

Man is the first word of the first aphorism of Francis Bacon's "chiefest" work.⁵ *Nature* is the second. Man and nature are Bacon's great themes. That is only to say that Bacon is a genuine philosopher. "The discovery of nature is the work of philosophy" and the "first philosopher was the first man who discovered nature," Leo Strauss says. Philosophy's attempt to discover the *natural* principle or principles of all that is sets it apart from other attempts to comprehend the whole. Strauss points to Aristotle's distinction between those first philosophers—"men who discoursed on nature"—and the *philomythos* "who discoursed on gods." Complete self-knowledge requires knowing how one stands in relation to the whole that religion, myth, and philosophy each try to grasp. If Strauss is right, then all philosophy is *natural* philosophy and "The whole history of philosophy is nothing but the record of the ever repeated attempts to grasp fully what was implied in that crucial discovery which was made by some Greek twenty-six hundred years ago or before."⁶

Bacon, however, believes he has something radically new to tell us about nature and man. "[T]hese words, *nature*, *art*, and *violence*," he complains, "are a kind of trivial shorthand."⁷ Men have mistakenly believed "that art is something different from nature, and things artificial different from things natural," that art is "merely an assistant to nature" competent "to finish what nature has begun, to correct her when lapsing into error, or to set her free when in bondage, but by no means

⁵ *Novum organum* (henceforth *NO*), ed. by Graham Rees with Maria Wakely, *The Oxford Francis Bacon* (henceforth *OFB*), vol. XI, Book I §1, 65. For Bacon's writings not yet available in the *OFB* edition, references will be to Spedding, Ellis, and Heath's *The Works of Francis Bacon* (henceforth *SEH*) or Benjamin Farrington's translations in *The Philosophy of Francis Bacon: An Essay on Its Development from 1603 to 1609 with New Translations of Fundamental Texts* (henceforth *F*). Subsequent references to this and Bacon's other writings will be cited by the short-form title (a complete key of short-form titles is available in the prefatory matter), chapter or section number (if applicable), volume in the *OFB* or *SEH* edition, and page number. I borrow this observation from Laurence Berns, "Francis Bacon and the Conquest of Nature," *Interpretation* 7, no. 1 (1978), 2. In his biography of Bacon, Bacon's chaplain, William Rawley, reports that Bacon judged *IM* in general and *NO* in particular to be his "chiefest" work (*SEH* I, 11). Bacon himself affirms that *NO* is the work he esteems most at *AHW* Epistle Dedicatory (*SEH* VII, 13).

⁶ Leo Strauss, *Natural Right and History* (Chicago: The University of Chicago Press, 1965), 81-82.

⁷ *DPAO* (*OFB* VI, 267).

to change, transmute, or fundamentally alter nature.”⁸ Bacon wants to convince us that man through his art has “the power to conquer and subdue her, to shake her to her foundations,” that man can relieve his poor estate and bring about “a kind of alternative universe or theatre of things,” a Kingdom of Man within the Kingdom of Nature.⁹ Bacon’s new “doctrine of knowledge as power,” Benjamin Farrington notes, also “involves a new definition of man.”¹⁰ Bacon’s formulae draw a new relation between man and nature, yet he nowhere expressly defines these most important terms. What is nature such that man can master it? What is man such that he can master nature? These are the questions I will try to put to Francis Bacon.

Why Bacon?

The importance of the concepts *man* and *nature*, I trust, is uncontroversial. The claim that Francis Bacon has anything valuable to teach us about them, I know, is not. So I owe you at the outset some reason to turn your attention to an English statesman long-dead and nowadays much-maligned (when, that is, he is remembered at all).

People once read Bacon to learn how science should be done. Even those whose own philosophy, methodology, or scientific practices differed from Bacon’s engaged seriously with his thinking.¹¹ Only because Bacon was celebrated as the founder of a new scientific and political

⁸ *DAS* II.2 (*SEH* IV, 294).

⁹ *CV* (F, 93) and *PAH* §1 (*OFB* XI, 455).

¹⁰ Benjamin Farrington, *The Philosophy of Francis Bacon: An Essay on Its Development from 1603 to 1609 with New Translations of Fundamental Texts* (Liverpool: Liverpool University Press, 1964), 51.

¹¹ Antonio Pérez-Ramos provides a helpful overview of the history of Bacon’s reception in his *Francis Bacon’s Idea of Science and the Maker’s Knowledge Tradition* (Oxford: Clarendon Press, 1988), 7–31. He notes, for example, that though they found much of value in Bacon’s writings, Marin Mersenne rejected the “positive parts of the Lord Chancellor’s philosophy” and Pierre Gassendi had “grave doubts about the practicability of his [Bacon’s] induction.” Closer to home, “The ‘technical’ part of Bacon’s *œuvre*” was “almost fully incorporated into the official methodology” of the Royal Society, Pérez-Ramos also notes, “sometimes in crying contradiction with the actual practice of its cultivators.” Cf. Graham Rees, “Reflections on the Reputation of Francis Bacon’s Philosophy,” *Huntington Library Quarterly* 65 (2002):

project and a forerunner of Enlightenment philosophy could he later be vilified by those set against such reforms.¹² They agreed with his greatest advocates and loudest promoters in holding Bacon responsible for those modern “developments” they deplored. This extreme and polarized reception—crediting Bacon for every inch of progress or blaming him for every modern ill—persisted as long as scientists and philosophers continued to trace the methods of modern natural science to Bacon. Once the experts concluded that Bacon was a crude empiricist with a naive understanding of induction and no appreciation of the role of mathematics or hypotheses, he could safely be forgotten.¹³ Bacon—or their understanding of Bacon—no longer fit their picture of science. They could tell the story of the birth of modern science without saying much or anything about him.

These days, those who study Bacon usually do so to round out the history of ideas. His role varies with the story an author wants to tell about the development of modern science. Among those who emphasize the continuities between medieval, Renaissance, and modern science, Bacon is usually cast as a transitional figure. Paolo Rossi established the model in his pioneering studies of the

379-94. Rees’s recounting emphasizes the “selective appropriation” of Bacon’s works and calculated effort to draw on the Lord Chancellor’s “cultural prestige.”

¹² See, for example, Joseph de Maistre, *Examen de La Philosophie de Bacon, ou l’on Traite Différentes Questions de Philosophie Rationnelle*, and Max Horkheimer and Theodor W. Adorno, *Dialectic of Enlightenment: Philosophical Fragments*, ed. Gunzelin Schmid Noerr and trans. Edmund Jephcott (Stanford: Stanford University Press, 2002), ch. 1.

¹³ Hans Jonas, whose interpretation of Bacon is by no means unfriendly, describes “the combination of prescience and blissful ignorance which seems to be necessary for mortal man to entertain a grand vision.” By a kind of “prophetic anticipation,” he foresaw that a new knowledge could make man nature’s master, but “Bacon’s grasp of the nature of this knowledge itself, untouched by the spirit of Galilean analysis, was strangely imperfect, and his own prescriptions would never have led to the results expected from them.” See Jonas’s “Seventeenth Century and After: The Meaning of the Scientific and Technological Revolution” in *Philosophical Essays: From Ancient Creed to Technological Man* (Englewood Cliffs, N.J.: Prentice-Hall, 1974), 74. Michel Malherbe provides another specimen example: “Of course we can praise the Chancellor’s sense of reformation, his critique of false sciences, his comments on academic institutions and the politics of science; we can even say, as the French Encyclopedists did, that he was the herald of experimental philosophy. But the fact remains that the Baconian concept of science, as an inductive science, has nothing to do with and even contradicts today’s form of science. As far as the method of science is concerned . . . Bacon’s *instauratio* went to a dead end, as early as the first progress of science in the seventeenth century. Members of the Royal Society claimed kinship with the author of the *Novum organum*, but ignored Baconian induction as a scientific method. In a word, from Bacon to our time, there is a gap that cannot be filled up.” See Michel Malherbe, “Bacon’s Method of Science,” in *The Cambridge Companion to Bacon*, ed. Markku Peltonen (Cambridge: Cambridge University Press, 1996), 75.

influence magical and alchemical traditions and the mechanical arts exercised on Bacon's thinking.¹⁴ These new histories do little to restore Bacon's reputation. Almost invariably Bacon's scientific method is judged a dead end and his substantive natural philosophy a curiosity—interesting, but not really that important. By broad consensus, his real contributions to the development of modern science are limited to his effective advocacy of science and his anticipation of the institutions necessary to support it.

A second type studies Bacon today because they believe he has something to teach us about the dangers of science, technology, and technocratic politics. They unhesitatingly count Bacon among the founders of modern natural science, even or especially when his natural philosophy is not their subject. They also tend to regard him as perhaps the deepest and most prescient thinker about the political and moral consequences of that science. Howard White, for example, wants to learn what we hazard in staking our welfare on a faith in the beneficence of science's conquest of nature from the man who inspired that faith.¹⁵ To corroborate their own judgment of Bacon's greatness, they remind us of the high regard he enjoyed among the leading thinkers of his and subsequent generations, that "Rousseau said that perhaps the greatest of philosophers was Lord Chancellor of England," that "French Enlightenment thinkers saw him as their essential forbear," that "Kant and Darwin honored him by using mottoes drawn from his writings to stand at the head of their chief works."¹⁶ These students of Bacon lament the scholarly neglect and low station he has been relegated to. Some hope their own studies will restore Bacon's reputation and return him to his rightful place in the canon.

¹⁴ See Paolo Rossi, *Francis Bacon: From Magic to Science*, trans. Sacha Rabinovitch (London: Routledge & K. Paul, 1968) and *Philosophy, Technology, and the Arts in the Early Modern Era*, trans. Salvator Attanasio (New York: Harper & Row, 1970).

¹⁵ Howard White, *Peace Among the Willows: The Political Philosophy of Francis Bacon* (The Hague: Martinus Nijhoff, 1968), 1-13.

¹⁶ Laurence Lampert, *Nietzsche and Modern Times: A Study of Bacon, Descartes, and Nietzsche* (New Haven: Yale University Press, 1993), 17.

Thus both types justify their studies of Bacon by pointing to his place in history. Since neither my method nor my aim is historical, my justification for looking back to Bacon cannot very well be historical, either. I have no real interest in rehabilitating Bacon's reputation or enshrining him among modernity's founders. Neither do I have any strong thesis to advance about the growth of modern science or Bacon's place in it. Questions of historical development can be both interesting and useful, but are beyond my ken. I am no historian. I suspect that modern natural science is deeply Baconian, but I have not tried to make that case here. Since my argument is not historical, it cannot yield such historical conclusions.¹⁷

Nor have I turned to Bacon to diagnose what ails us moderns. It seems altogether plausible that he has something important to teach us about choices that have led to environmental degradation, the threat of nuclear annihilation, disenchantment, nihilism, and many other threats to our physical, spiritual, and political well-being. I am less sure he has much to teach us about their cures. Knowing where we come from does not give us the power to undo what is done. Knowing the road we have traveled may not tell us much about the road ahead.¹⁸

This dissertation is not really *about* Francis Bacon. I have no news about his role in the development of modern science, at least nothing that would register with those who have staked a position. I have nothing urgent to report about modern man's situation or how a study of Lord Bacon's writings can save us. While I will be constantly concerned with what Bacon said, I attach

¹⁷ There may be some who believe that a conceptual analysis, undertaken through the study of old writings, cannot be performed rigorously without being rigorously historical. To them I concede the danger of anachronism, of twisting the thoughts of another time and place into shapes unrecognizable to those who thought them. But if read carefully, Bacon's texts suffice. In fact, the historical distance between Bacon and us proves to be a boon. In just the way that studying a text in a language you have not mastered slows you down and forces you to attend to the ideas and their expression in new ways, reading a text from a different time requires greater care. Whatever special tools historians have developed resolve finally to just such careful reading and necessarily assume the possibility, through just such careful reading, of overcoming time and conceptual differences. And my approach may better avoid the opposite mistake, of making Bacon into a man completely comprehended by his place and time.

¹⁸ Laurence Berns helpfully reminds us that "the fundamental problems turns out to be not only the problem of consequences, but rather understanding the truth, or adequacy, of the conception of nature underlying the notion of the conquest of nature." See "Francis Bacon and the Conquest of Nature," 1-2.

little importance to the fact that it was Bacon who said it. Instead *with* Bacon I want to try to think more clearly about nature and man, the relation between the two, and how we could begin to know either.

In a way, a project like mine seems hopelessly un-Baconian. Why labor over the books of Francis Bacon when we could instead study man and nature themselves? William Rawley, Bacon's chaplain, acknowledges that Bacon was "a great reader of books" but insists that his knowledge came not from reading, "but from some grounds and notions from within himself" or perhaps "a beam of knowledge derived from God."¹⁹ Or Bacon may have been, as Rousseau suggested, among those teachers of the human race who learned everything from nature herself.²⁰ I most surely am not. I share with Socrates the suspicion that questions like mine are best pursued obliquely, not in things themselves, but in our speeches about those things. Or I, at least, have needed the thoughts of others to draw out and sharpen my own, and I have found in Bacon a helpful interlocutor.

We cannot choose our teachers knowing in advance that what they will teach us is true. Nor should we disavow them when we find ourselves unable to agree fully with their conclusions. I report here what I have discovered in Bacon's writings not because I wish to persuade you that Bacon's account of nature and man is everywhere true, but because I think Bacon can help us better understand the knot of problems we face when we try to give an account of nature and man.

¹⁹ William Rawley, "The Life of the Right Honourable Francis Bacon, Baron of Verulam, Viscount St. Alban" (*SEH* I, 11).

²⁰ Jean-Jacques Rousseau, *The First and Second Discourses*, ed. Roger D. Masters, trans. Judith R. Masters and Roger D. Masters (New York: St. Martin's, 1964), 64-65.

My Approach

My argument centers on close readings of a number of Bacon's works. I have tried to let his texts guide my reading.

The single best clue is Bacon's own account of his architectonic project, his *Great Instauration*.²¹ He lays out a six-part plan that begins with (I) a review or critique of received learning that makes way for (II) the method itself, a new kind of logic for the better direction of human reason. Method corrects, as far as possible, the mind's errant tendencies, allowing the sciences at long last to be rebuilt on a solid foundation. But the mind's new machinery needs material on which to work, and so Bacon sets out to gather "serviceable and well sorted matter" in (III) a series of natural and experimental histories. Having supplied the materials and built the machine, Bacon sets out to instruct those who would use it by providing (IV) worked examples of the method applied to the newly gathered matter. Because the work requires the sustained effort of many generations, Bacon offers, as "interest payable until the principle can be had," (V) anticipations of the philosophy to come, provisional conclusions that have not been certified by his new method. Generations not yet born will bring Bacon's program to a conclusion and enjoy the fruits of (VI) an active science or "the philosophy to come." This plan served as a blueprint for all his philosophical activity. Each philosophical work—published or unpublished, finished or fragmentary—had a place in it.

Where should we look for Bacon's teaching about nature? Only at the program's end could we expect a complete and method-certified knowledge of nature, but of course Bacon never got that far. He stopped short even of the kind of anticipations he had planned for the *Instauration's* fifth part. Graham Rees, however, suggests that Bacon had "a complete but provisional system of

²¹ *DO* (OFB XI, 27-47).

knowledge about the workings of nature” and left us enough clues to reconstruct it.²² According to Rees, that speculative system is Bacon’s answer to the question, what is nature?

I have taken the opposite approach. Rees wants to get as close as he can to Bacon’s conclusions. I think, to the contrary, that we should begin where Bacon begins. According to Bacon’s own plan, that means beginning with his review of received learning and his founding of a new method.

Bacon’s Beginning

Judged by scholarly opinion and some of his own statements, Bacon’s founding act and the novelty of his science is the discovery of a new tool, a method or set of instructions for the right direction of the mind. He styles himself a modern. “I profess,” he says, “to have something better to offer you than the ancients,” “a totally new beginning, an approach that is certainly quite new,” a watershed work which will “blaze forth to future generations with this flame new kindled in the dark recesses of philosophy.”²³ Received knowledge, Bacon claims, has proved “barren in works,” productive only of “quarrels and barking disputations.” “Bloated with questions,” the sciences are “evidently moribund” and “almost dead in their tracks.”²⁴ Those few who have seen the poverty of ancient science and have labored to improve it “have shrunk from cutting themselves completely free of received ideas to seek out the sources of things,” imaging that they could add to the sciences while “they defer to received and customary opinions.”²⁵ But, Bacon argues, we can ill afford to confine ourselves to what the ancients supposed were the limits of human knowledge and power.

²² Introduction to *OFB* VI, xxxvi-xxxvii.

²³ *RPb* (F, 118), *IM* Epistle Dedicatory (*OFB* XI, 7).

²⁴ *IM* (*OFB* XI, 13).

²⁵ *IM* (*OFB* XI, 15).

The frontispiece of his *Instauratio magna*, an image of a ship passing through the Pillars of Hercules, expresses the new task Bacon urges upon his and succeeding ages. Men once thought it a great and brave undertaking to sail along the coast. For them, the stars were adequate guides. But the world they knew is not the world entire, and our theoretical and practical ambitions demand that we sail beyond those ancient, baleful Pillars. Where the ancients said *non ultra*, Bacon urges, let our motto be *plus ultra*.²⁶ To hazard rough, open waters in search of new lands we need the help of some mariner's compass, a tool to more surely direct our journey, "a completely new route for the intellect, one unknown and untried by the ancients." We have, Bacon says, "but one way to health and sanity: to do the whole work of the mind all over again."²⁷

Yet one can start over only what has already begun, can see the new *as new* only in the face of the old. *Modern* is a term of distinction, logically "antiphonal, a new voice raised in opposition to old voices, which must have been sufficiently audible or clearly recollected for the new to define itself."²⁸ Bacon's strongly-asserted novelty betrays a deep preoccupation with the past, and whether he fathered modernity or was merely its herald, Francis Bacon wrote and thought in the shadow of the pre-modern world. Anxious to leave some trace of his ambitious project to direct the industry of men not yet born, Bacon nevertheless decides to sail along the coast before heading for open and uncharted waters. "For it seemed to me," he says, "that I should spend some time too on received ideas."²⁹ And so, according to Bacon's plan, the instauration of the sciences should begin not with the new method, but with a review of received knowledge.

²⁶ *AL* II (OFB IV, 71) and *DAS* II.10 (*SEH* IV, 311). See also *RP* (F, 131): "It would disgrace us, now that the wide spaces of the material globe, the lands and seas, have been broached and explored, if the limits of the intellectual globe should be set by the narrow discoveries of the ancients."

²⁷ *NO* Preface (OFB XI, 55-57).

²⁸ David Lachterman, *The Ethics of Geometry: A Genealogy of Modernity* (New York: Routledge, 1989), 25.

²⁹ *DO* (OFB XI, 27).

So deep and ranging was Bacon's confrontation with the past that the first part of his six-part plan had to grow—and grow considerably—in order to contain it. From almost the beginning of his publishing career to its end, and in many unpublished writings besides, Bacon tried in diverse modes to take the measure of his and his age's intellectual inheritance and turn it to some future profit. The comparative bulk and importance of these works—books with titles like *New Atlantis*, *Novum organum*, *The Advancement and Proficiencie of Learning*, *De augmentis scientiarum*, *Redargutio philosophiarum*, *Temporis partus masculus*, *De sapientia veterum*—document Bacon's struggle to make a new beginning. To free us from the tyranny of old opinions and gain a hearing, Bacon must grapple with earlier thinkers whose science he is confident his own, novel science can appropriate, advance, or in some measure replace. His science may certainly be quite new, but it is not an absolutely first beginning. Bacon must lay his “new foundation from the very beginning” among the ruins of earlier philosophical constructions. His philosophy of the future is necessarily backward-looking; his founding inevitably a refounding.

The trick is to see aright the relation between new and old in Bacon's refounding, to understand how his deep preoccupation with the ancients prepares the radical new beginning he proposes. It will help if we can first sidestep an unproductive controversy.

The grandness and audacity of Bacon's claim to be the founder of a wholly new science almost dare us to take sides. When Loren Eiseley called Bacon *The Man Who Saw through Time* he meant, no doubt, to emphasize the future-looking aspect of Bacon's philosophy.³⁰ Bacon's champions and apologists, like Eiseley, concentrate their enthusiasms and exegetical efforts on Bacon's prophetic—or at least prescient—vision of a then-nascent natural science. For them, Bacon's modernity is beyond doubt. He can be forgiven whatever bits of Scholasticism or pieces of

³⁰ Loren Eiseley, *The Man Who Saw through Time* (New York: Schribner, 1973).

alchemy he brought with him. He can be forgiven his imperfect anticipations of the methods of modern science. More important than either is the fact that Bacon carried himself—and so also us—out of the dark ages and into the light. As Abraham Cowley put it, Bacon, like Moses, led us through the desert to the “very border” of the promised land “And from the Mountain Top of his Exalted Wit, / Saw it himself, and shew’d us it.”³¹

But for some time now philosophers and historians of science have set about unearthing the pre-modern roots of Bacon’s thought. Their efforts have exposed, they believe, a Lord Chancellor more medieval than modern. They emphasize evidence of the sympathy and continuity between Bacon and his predecessors—an ancestry Bacon rejects—while denying all but the most meager continuities between Bacon and those who said publicly and repeatedly that they were working in directions he first espied. Bacon, on their telling, is a Scholastic or an alchemist; a Platonist, an Aristotelian, a Ramist, or a Paracelsian—anything, that is, but what Bacon says he is: the founder of a new way of contemplating and mastering nature. Bacon’s claims to radical originality, these readers contend, are either the marks of a second-rate mind unable to accurately assess his intellectual debts or just so much bombast and rhetoric. Ignoring its context, they pounce on Bacon’s own claim that he is merely a trumpeter, allowing that he may be a gifted spokesman or apologist, but not a real and original scientist.³²

Too much scholarly hay has been made about Bacon’s contested modernity to think that there is nothing there, and Bacon himself staked too much on his claim to novelty for us to leave it unexamined. But the problem is not, as too many of Bacon’s readers wrongly suppose, to place Bacon on one side or the other of a line, drawn as precisely as possible, between modernity and the

³¹ “To the Royal Society,” in Thomas Sprat, *History of the Royal Society*, ed. Jackson I. Cope and Harold Whitmore Jones (St. Louis: Washington University, 1958).

³² See *DAS* 4.1 (*SEH* IV, 372). See also Graham Rees’s comment at *OFB* XI, xl.

darkness that preceded it. Those who emphasize Bacon's modernity in all likelihood underestimate what he owes to the past. Those who doubt his modernity probably overstate his debts. But the size of the debt is not nearly as important as its character. We get no closer to Bacon by trying to make him a muddled Aristotelian, a magic-minded alchemist, or Newton's teacher. Such attempts to reduce Bacon to an epigone or a forerunner miss the point. Luckily, nothing compels us to pick a side in this debate. Prescinding from questions about Bacon's actual originality and historical influence frees us to take him on his own terms, to begin with Bacon's self-understanding.

Bacon placed himself somewhere in history's middle.³³ "The present," he says, "is like a seer with two faces, one looking toward the future, the other toward the past."³⁴ Bacon, too, is Janus-like. His self-appointed task requires that he join philosophy past and future, that he establish the right relations between the long-labored tradition and his own innovations.

What is the nature of those relations? On Rees's telling, Bacon "raided disparate traditions for attractive titbits which he refashioned as a curious hybrid which embodied some very peculiar alliances of ideas." With materials drawn from "atomist and Aristotelian natural philosophies, Copernicanism, Galileian observational astronomy, the work of Paracelsus, of William Gilbert, Telesio, Patrizi, and others besides," Bacon constructed a system that was "eclectic to a fault."³⁵ John C. Briggs adds to the ledger Bacon's borrowings from Platonist and Christian sources,

³³ Perhaps because his work was not as readily and enthusiastically received as he would have hoped, he came, near the end of his life, to believe that his time had not yet come, that he and his ideas really belonged to the future. "As for me," he writes, "I am pretty sure that, because I have little faith in the genius of our times, my own words (as far as the work of the instauration is concerned) could be accused of lacking an age or an era to match them. . . . That is why I am devoted to posterity and put forward nothing for the sake of my name or taste of others, but, knowing well enough the nature of things that I impart, I deal out work for ages to come" (*ANN (OFB XIII, 173)*).

³⁴ *TPM (F, 68)*.

³⁵ Graham Rees, Introduction to *OFB VI*, xxxvii. See also "Francis Bacon's Semi-Paracelsian Cosmology" *Ambix* 22 (1975), 81-101; "Francis Bacon's Semi-Paracelsian Cosmology and the *Great Instauration*," *Ambix* 22 (1975), 161-73; "Matter Theory: A Unifying Factor in Francis Bacon's Natural Philosophy?" *Ambix* 24 (1977), 110-25; "Atomism and 'Subtlety' in Francis Bacon's Philosophy" *Annals of Science* 37 (1980), 549-71; "Bacon's Speculative Philosophy," in *The Cambridge Companion to Bacon*, ed. Markku Peltonen (Cambridge: Cambridge University Press, 1996), 121-45.

especially “the Wisdom Literature” and “the Pauline Epistles.”³⁶ Bacon’s eclecticism, or what Briggs calls Bacon’s “syncretism,” threatens to make Bacon the unwitting confluence of disparate and often incompatible traditions. Bacon adapts those sources, sometimes radically, but we are left to wonder what governs his choices. Briggs and Rees at times give us a Bacon that is little more than the sum of his sources. We see all the elements but lose the principle that holds them together. Bacon himself disappears behind an accounting of his intellectual debts. In becoming a bit of everything, he becomes nothing at all, a paradox, a cipher.

Richard Kennington and Laurence Berns offer another and more likely picture of Bacon. “The modern project, especially with Bacon and Descartes, was worked out in explicit opposition to classical philosophy and science,” Berns says, and so “The meaning of the conquest of nature cannot be adequately understood without understanding the reasons for rejecting the view of nature it was formed explicitly to oppose, the classical or Platonic-Aristotelian idea of nature.”³⁷ Kennington likewise reminds us of what should be obvious, that Bacon’s stance toward the past is, on the whole, critical. “Bacon makes a sustained critique of ancient philosophy in *New Organon*, Part 1, which has largely escaped thematic scrutiny,” he says.³⁸ With the exception of his own investigations, the situation is little changed.

That critique “has no rival in length or comprehensiveness in the writings of the seventeenth-century philosophers,” perhaps because Descartes, Hobbes, Spinoza, and the rest took Bacon’s critique to be definitive. The critique is more tightly focused than is typically recognized. Bacon “never considers the medieval Scholastic philosophers and scarcely alludes to Telesius and

³⁶ John C. Briggs, *Francis Bacon and the Rhetoric of Nature* (Cambridge, MA: Harvard University Press, 1989), vii.

³⁷ Laurence Berns, “Francis Bacon and the Conquest of Nature,” 2.

³⁸ Richard Kennington, “Bacon’s Critique of Ancient Philosophy in *New Organon* 1,” 17.

Renaissance philosophers.”³⁹ Socrates, Plato, and Aristotle are his real target. Socrates destroyed the Presocratics’ promising beginnings when he called philosophy down from the heavens and brought the study of nature to an end, and philosophy as Bacon finds it is still in the grips of that Socratic error.⁴⁰ Kennington also reminds us that Bacon’s critique focuses on the ancients’ “form of investigating and discovering”—their “method”—arguing that “the critique of the ancients in Part 1 is the necessary preparation for the method itself in Part 2 of the *New Organon*.” Bacon’s own refounding is grounded in and made coherent through his critique of Socrates’s earlier refounding.

Bacon’s thinking, then, is more deeply indebted to the philosophical tradition than either his future-looking apologists or his critics suppose, but not in the way that either imagines. His new science is neither an unproblematic development of ancient starting points nor a free construction. Bacon knows that his is not an absolutely first beginning. Philosophy has a past and he is a relative late-comer. His new beginning must be a beginning-again, a refounding of philosophy and the sciences. Bacon’s new science depends on previous science, not by borrowing piecemeal from old theories or unthoughtfully appropriating ancient philosophical terms, but by setting itself up in a kind of critical-dialectical opposition to the science it means to replace. No matter how much he might like to, Bacon cannot begin with nature unmediated. The philosophical tradition stands in his way, and Bacon’s own path to nature must pass through received learning. His own philosophy, his new method, and his idea of nature take shape, I will argue, in his critique of Socratic philosophy’s failures.

³⁹ Kennington, “Bacon’s Critique of Ancient Philosophy in *New Organon* 1,” 17. What Kennington says about NO I is true of Bacon’s writings generally, a claim I will substantiate in the first chapter.

⁴⁰ See, for example, NO I §§78 and 79 (*OFB* XI, 123-25).

Interpretive Difficulties

I am not the first to ask what Bacon means by *nature*. There is general agreement that he has a novel idea of nature, but hardly anyone stops to explain what that new idea is. As Sophie Weeks notes, “there is very little comment in the literature on how Bacon used the term ‘nature.’”⁴¹ Besides her own article, she points to a few essays and a book chapter.⁴² To these one could add a few more articles.⁴³ By beginning where Bacon begins, I have been able to avoid some of their interpretive dead-ends.

The meaning of *nature* most often comes up in attempts to solve a long-standing scholarly debate about the relation between art and nature in Bacon’s thinking. Weeks describes a narrow version of that debate, pitting Paolo Rossi against William Newman.⁴⁴ Starting from the same passage, both agree that Bacon rejects Aristotle’s distinction between art and nature.⁴⁵ As Weeks tells it, “their real divergence rests on their respective sources for Bacon’s position.”⁴⁶ Rossi believes Bacon collapsed the art-nature distinction because he, Rossi, privileges the role of the mechanical

⁴¹ “Francis Bacon and the Art-Nature Distinction,” *Ambix* 54 (2007), 104, n. 15.

⁴² In the footnote, she points to Richard Kennington, *On Modern Origins: Essays in Early Modern Philosophy*, ed. Pamela Kraus and Frank Hunt (New York: Lexington Books, 2004), 1-15, 33-48; Michèle Le Doeuff, “Man and Nature in the Gardens of Science,” in *Francis Bacon’s Legacy of Texts: The Art of Discovery Grows with Discovery*, ed. William Sessions (New York: AMS Press, 1990), 119-37; John C. Briggs, *Francis Bacon and the Rhetoric of Nature* (Cambridge: Harvard University Press, 1989), 132-50. In the article as a whole, Weeks develops Graham Rees’s work on Bacon’s matter theory, citing in particular his “Francis Bacon’s Semi-Paracelsian Cosmology and the *Great Instauration*,” *Ambix* 22, no. 2 (1975): 81-101; “Matter Theory: a Unifying Factor in Bacon’s Natural Philosophy,” *Ambix* 24, no. 2 (1977): 110-25; “Atomism and ‘Subtlety’ in Francis Bacon’s Philosophy,” *Annals of Science* 37 (1980): 549-71.

⁴³ Laurence Berns, “Francis Bacon and the Conquest of Nature,” *Interpretation* 7 (1978), 36-48; Dennis Desroches, “Figuring Science: Revisiting Nature in Bacon’s *Novum Organum*,” *The Midwest Quarterly* 45, no. 3 (2004), 304-18; Margaret Llasera, “Art, Artifice, and the Artificial in the Works of Francis Bacon,” *Bulletin de la Société d’études anglo-américaines des XVIIe et XVIIIe siècles* 22 (1986), 7-18; Peter Zetterberg, “Echoes of Nature in Salomon’s House,” *Journal of the History of Ideas* 43, no. 2 (1982), 179-93.

⁴⁴ Weeks, “Francis Bacon and the Art-Nature Distinction,” 102-04. She is discussing the following texts: William R. Newman, *Promethean Ambitions: Alchemy and the Quest to Perfect Nature* (Chicago: The University of Chicago Press, 2004), 256-71; Newman, “Alchemical and Baconian Views on the Art/Nature Division,” in *Reading the Book of Nature: The Other Side of the Scientific Revolution*, ed. Allen G. Debus and Michael T. Walton (Kirskville, MO: Sixteenth Century Journal Publishers, 1998), 81-90; Paolo Rossi, *Francis Bacon: From Magic to Science*, trans. Sacha Rabinovich (London: Routledge and Kegan Paul, 1968), 26-27; Rossi, *Philosophy, Technology, and the Arts in the Early Modern Era* (New York: Harper and Row, 1970), 137-45.

⁴⁵ The passage in question is *DGI* (OFB VI, 103). There, Bacon says that “artificial things differ from natural things not in form or essence, but only in the efficient.”

⁴⁶ Weeks, “Francis Bacon and the Art-Nature Distinction,” 104.

arts in Bacon's thinking. Newman looks instead to medieval scholastic sources to make sense of Bacon's text. Let us call this the *historical approach*.

Rossi's and Newman's approach is the same as Rees's and Briggs'. They assume that Bacon's science and substantive natural philosophy are rooted in or at least continuous with certain traditions. That assumption naturally suggests an interpretive strategy: to trace Bacon's teachings to their sources, we should look for linguistic continuities. If, for example, we want to know what Bacon means by *nature*, we should try to see which tradition his formulations most closely match.

Bacon's texts, however, will not yield to such strategies. Weeks rightly argues that we will miss Bacon's real meaning if we fail to see, as she says Rossi and Newman do, that Bacon does not use the words *nature* and *art* in their traditional senses.⁴⁷ Indeed, repurposing old words is one of Bacon's strategies for transforming the tradition. Sometimes he redefines surreptitiously, as in his novel use of the word *charity*.⁴⁸ Other times, Bacon announces the change. He says, for example, that he will continue to use the words *metaphysics* and *form*, but will give them a different sense.⁴⁹ Consequently, we cannot rely on narrow readings of isolated passages or discover Bacon by appealing uncritically to his historical sources, even when he seems to be using their words.

Weeks has put her finger on an especially difficult interpretative problem: we have to decide how to treat Bacon's "sources." Rossi, Newman, Rees, and Briggs each discovers a different Bacon by interpreting his texts in light of different traditions. And on its own terms, each reading is

⁴⁷ Peter Zetterberg succumbs to a similar problem. He stakes a position between Rossi's and Newman's. Rossi was right to say that Bacon rejected the traditional view that nature is superior to art. He was wrong, however, to say that Bacon rejected the view that art imitates nature. Zetterberg produces an impressive string of quotations in which Bacon talks about imitation. He fails, however, to ask what Bacon means by *imitation*. By following out Zetterberg's line of reasoning, we can say that, because nature is not superior to art, imitations of nature cannot be art's attempts to perfect nature. Instead, *imitation* means something like *exact copy*. Man seeks to "emulate God" and bring about "a completely artificial realm fashioned in imitation of God's creation." If that is in fact what Bacon means by *imitation*, Zetterberg and we should ask why man would want a perfect copy of what we already have.

⁴⁸ See, for example, *Essays* "Of Goodness And Goodnesse of Nature" (OFB XV, 38-41).

⁴⁹ *AL* II (OFB IV, 80-81) and *NO* II §2 (OFB XI, 201-03). I discuss Bacon's redefinition of metaphysics in chapter one and his redefinition of both metaphysics and form in chapter three.

plausible because Bacon really does engage these traditions. You need not look far to find Bacon talking about Democritus and Heraclitus, Plato and Aristotle, Hippocrates and Galen, Paracelsus, Gilbert, and Telesio. He always seems to have ready to hand a line from Cicero or Seneca or an example drawn from Plutarch or Tacitus or Livy. His works—some more than others—are filled with biblical allusions and quotations. But nothing in Bacon’s texts license us to reduce him to some set of those sources.

Even if we catalog Bacon’s sources, we are still left with a puzzle about how to put together so many disparate pieces. Confronted by those inconsistencies, some commentators throw up their hands. If they cannot reduce those contrary influences to some order, they can at least report them honestly. More often, commentators purchase a measure of coherence at the cost of comprehensiveness. They cobble together a more consistent Bacon by ignoring or explaining away incongruous elements. The composites they draw are often self-portraits. Michèle Le Doeuff observes that “Many Baconian commentators formulate global interpretations that reach the same degree of generality as his own assertions, and sometimes unhappily substitute theirs for a genuine framework of a philosophy. As soon as such a commentator neglects to take into account global statements of an author, he or she is unfortunately exposed to ‘rewriting,’ as it were, *the philosophy of the philosophy of an author*.”⁵⁰

Those “rewritings” have a way of standing between us and Bacon’s texts. Accordingly, Dennis Desroches aims to expose “certain orthodoxies” in order “to offer a new and more suggestive reading of the place of nature in Bacon’s thought.”⁵¹ But it is not obvious that we get any closer to Bacon when we approach him by way of those misinterpretations. Critique requires a

⁵⁰ “Man and Nature in the Gardens of Science,” 122.

⁵¹ Dennis Desroches, “Figuring Science: Revisiting Nature in Bacon’s *Novum Organum*,” *Midwest Quarterly: A Journal of Contemporary Thought* 45, no. 3 (Spring 2004), 304-05.

certain concession to our opponent. Inevitably, we distort Bacon's teachings by defining them against those misunderstandings. We are so busy making Bacon answer their questions that we lose track of Bacon's own questions. The real risk in debate is not losing the argument but losing oneself. Understanding this, Bacon declined to debate those who began from principles opposed to his own.⁵² We should learn from his example.

Once we have bypassed the various "Baconianisms" and declined to search for Bacon in his sources, all that remains is to try to understand Bacon on his own terms. Michèle Le Doeuff, however, worries that "In attempting to grasp the Baconian conception of nature or the relationship between man and nature, one finds oneself immediately confronted with statements that are so general as to despair of ever finding a consistent theory into which to place them."⁵³ She divides Bacon's statements about nature into two categories. When Bacon speaks about nature itself the procedures by which nature can be known, he speaks clearly enough. When he speaks about "the problem of 'man and nature,' he ventures onto more uncertain and less univocal ground, into the realm of metaphorical considerations."⁵⁴ We can nevertheless try to interpret those uncertain metaphors, and Le Doeuff does with considerable success. For Bacon, she argues, nature is a garden and man a gardener. Using the paradigm of gardening, she offers insightful readings of several other metaphorical passages, in particular Bacon's well-known assertion that man is "the servant (*minister*, Le Doeuff prefers "agent") and interpreter of nature."⁵⁵

Not everything will fit into her chosen paradigm, however. Appealing to Hegel's judgment, she looks past one of Bacon's most important (and frequently repeated) claims about nature, that

⁵² See, for example, NO I §115 (OFB XI, 173).

⁵³ "Man and Nature in the Gardens of Science," 120.

⁵⁴ "Man and Nature in the Gardens of Science," 125.

⁵⁵ NO I §1 (OFB XI, 65). Le Doeuff, "Man and Nature in the Gardens of Science," 120-21 and 131.

“Nature exists in a triple condition and is subject, as it were, to three kinds of government.”⁵⁶ Texts like this that resist her interpretive approach cause her to wonder if Bacon sometimes “is speaking in such indefinite terms that he does not now exactly what he is saying.”

That Weeks can give this passage a definite and intelligible reading and that she and Le Doeuff draw similar conclusions from different texts should give us reason to hope that Bacon does have a coherent idea of nature that we can uncover through a careful reading of his texts. Weeks’ reading reveals Bacon’s “intensely fecund concept of nature” in the details of his teaching about matter: that it is infinitely malleable, plenipotentary, and purposeless and thus the source of all operative power. This picture of nature lines up well with the picture Le Doeuff discovers in Bacon’s gardening metaphors. On her reading nature is *generative source*. Man the gardener can till, plant, weed, and water, but finally it is the plant itself that grows. Man can only put together or separate natural bodies. All the real work is done by nature.

What neither Le Doeuff nor Weeks can explain is how Bacon knows nature to be such. That lacuna would be a problem in trying to understand the work of any philosopher, but especially so in Bacon’s case. For Bacon also claims to have discovered a new method, a new way of knowing that finally allows us to grasp nature as it really is, and by means of his own method Bacon could not know what Weeks and Le Doeuff say he knows about nature. I do not mean to say that Weeks and Le Doeuff are wrong, only that their account is incomplete. We need to know not just what Bacon thinks, but why Bacon thinks it.

Rossi, Newman, and Briggs want to tell us where Bacon got his notions. Why does Bacon deny that art perfects nature? Because, says Rossi, Agricola and others had raised the status of the

⁵⁶ *PAH* §1 (*OFB* XI, 455). Le Doeuff, “Man and Nature in the Gardens of Science,” 128-29.

arts enough to challenge the old prejudices about nature's superiority to art.⁵⁷ Or, says Newman, because certain medieval alchemists said that art and nature are not essentially different.⁵⁸ Their superficial differences belie their shared premise. Newman and Rossi agree that Bacon thinks what he thinks because other people, at some earlier time, had the same or similar thoughts. In appealing to the circumstances and events of Bacon's life, Benjamin Farrington's biographical approach likewise roots Bacon's philosophy in external causes. They uncover some of the *conditions* and *sources* of Bacon's thinking, but they do not reveal his *reasons*.

Le Doeuff offers little help. A few interspersed remarks suggest that she doubts that Bacon has reasons or, if he does, that we can discover them. His idea of nature "derives in fact from a purely theoretical decision"; metaphors "disguise the purely thetic nature of Bacon's starting point."⁵⁹ His idea of nature is the product of an inscrutable choice.

Weeks' approach offers more hope. She rightly abandons Rees's and Briggs's historical and Farrington's biographical approaches.⁶⁰ If we want to know what Bacon thinks, we have to look to Bacon himself. She makes a promising beginning by refusing to assume that we already know what Bacon means when he talks about nature and art. We can discover a coherent teaching about the nature of nature, she argues, if we "shift our attention from the search for sources to the internal coherence of Bacon's programme."⁶¹ What holds together Bacon's teaching is a teaching about matter, and so she tries to ground "the Baconian concept of nature" on "the ultimate foundation of Baconian matter."⁶²

⁵⁷ See Rossi, *Francis Bacon: From Magic to Science*, 1-11.

⁵⁸ See Newman, "Alchemical and Baconian Views on the Art/Nature Distinction," 85-88.

⁵⁹ Le Doeuff, "Man and Nature in the Gardens of Science," 121-22.

⁶⁰ Weeks argues that the issue between Rossi's and Newman's interpretations cannot be settled by their "efforts to relate the terms of a particular tradition without considering why they are retained by Bacon and how they function within his wider programme." See "Francis Bacon and the Art-Nature Distinction," 104.

⁶¹ "Francis Bacon and the Art-Nature Distinction," 104.

⁶² "Francis Bacon and the Art-Nature Distinction," 106.

But I wonder if she hasn't got it backwards. Why not think that nature is the more fundamental concept? Matter makes sense as an answer to the question, what is nature? I am not sure that the reverse is true. In fact, in Weeks' account it seems as if the concept of nature is coextensive with the concept of matter, or that nature is nothing other than matter. In that case, the knowledge of one cannot ground the knowledge of the other. Or if matter is more fundamental than nature, we would still want to ask how Bacon knows matter to be as he describes it. Weeks is right to insist that the "complexities of Bacon's natural philosophy . . . not be elided when trying to make sense of his programme."⁶³ But her search for "internal coherence" yields only Bacon's conclusions. We should demand with equal justice that the very possibility of those natural-philosophical claims be considered in light of his methodological prescriptions.

These interpretive problems point back to Bacon's own starting point, to the first part of his *Instauration*. There we will find Bacon dialectically wrestling with and radically transforming instead of borrowing piecemeal from his "sources." In his critique we will discover his reasons for urging on us a new method and a new idea of nature.

Interpretive Clues

If we are to take Bacon as our guide, we need to know how to read him. The problem is, there are no formulae for the interpretation of philosophical texts. Clues that unlock one text may do nothing to disclose another, even if written by the same author at about the same time. Each book must teach us how it would be read.

⁶³ "Francis Bacon and the Art-Nature Distinction," 127.

Bacon in particular demands this degree of interpretive care. He wrote a lot over a long period, revising and reworking as he went. He left behind far more fragments than finished works. The same themes show up in diverse forms—an essay or an aphorism, a natural-historical report or a survey of received learning, a philosophical treatise or a philosophical dialogue, an interpretation of an old fable or a fable of Bacon’s own invention. If that were not enough, one also has to consider the audience and rhetorical purpose of any particular text. The bulk, diversity, and rhetorical complexity of Bacon’s writings make it possible for competent readers to discover many different Bacons. Consequently, it is easy to write off Bacon as inconsistent, take him out of context, or go fishing for texts to support different interpretations.

So we should approach our reading of Bacon without our own agenda and with as few presuppositions as possible. We should be careful to consider a broad range of texts and take into account their contexts and how each fits into Bacon’s overall program. As far as possible, we should let Bacon speak for himself.

These are only a few cautions, not a recipe. Bacon counseled that if a man “will be content to beginne with doubts, he shall end in certainties.”⁶⁴ Whether or not he is right regarding the study of nature, I do not know, but I have not found it to be so in reading Bacon. Because the texts themselves are the only real standards of my interpretations, those interpretations are unavoidably provisional. Beginning with doubts, we can only hope to end in plausibilities.

Still, if we read Bacon attentively, we will notice a few underreported, unappreciated, or misunderstood features of his writing that can help guide our efforts.

I have already said a word or two about the first. Bacon’s work is deeply *critical*. For all his talk about making a fresh start and beginning with the experience of things themselves, Bacon

⁶⁴ *AL I (OFB IV, 31)*.

himself begins with old and authoritative opinions. His critiques of those opinions are the root of his new method and, with it, his new idea of nature. They show us both what Bacon thinks and why he thinks it. Because those criticisms are often shaped by rhetorical demands and obscured for prudential reasons, we will have to dig a bit to get to their real substance.

Second, Bacon is always trying to reconcile principles or powers that have been thought to be opposed or incompatible. He wants to join reason and experience, dogmatism and skepticism, contemplation and action, knowledge and power, self-love and charity, philosophy and Christian faith, art and nature. The reconciliation invariably changes both elements. For example, Bacon's lawful marriage of reason and experience works a radical change on both. To become powerful, knowledge cannot be simply receptive; to be knowledgeable, power must learn how to obey. To become master of nature, man can no longer be an awestruck spectator nor understand himself as the rational and political animal. The nature man masters is not an end or *telos* and cannot be so easily distinguished from the products of human art. To really understand Bacon, we have to learn to see how his syntheses alter their elements.

Anticipating Nature

Earlier, I compared my own approach with Rees's. He looks for Bacon's teaching about nature in those speculative conclusions or anticipations that belong to the Instauration's fifth part. I look instead to Bacon's critical engagement with Socratic philosophy in the Instauration's first part. We are now in a better position to see that Rees and I are really asking different questions. Instead of telling us again (as so many others have before) how Bacon thinks we should investigate nature, Rees wants to reconstruct Bacon's speculative philosophy in order to discover what Bacon says

about nature. Those provisional conclusions are worth inquiring, but they are not what I am after. I am looking instead for the idea of nature *presupposed* by Bacon's method.

As I see it, there are two, related problems with Rees's way of putting the question. First, he spotlights Bacon's anticipations of nature without satisfactorily explaining how they differ in character from the anticipations Bacon accuses the ancients of making. Second, he cleaves Bacon's natural philosophy in two. There is, Rees says, a "doubleness" to Bacon's enterprise. His "natural philosophy may be viewed as a single philosophy with two aspects or as two philosophies each with a peculiar character": a "program" and method "for constructing a body of scientific knowledge" and "a strange corpus of theory."⁶⁵ The question is, how is Bacon's speculative philosophy related to his method? Are they two aspects of a single philosophy, or two separate philosophies?

Bacon's "eclectic" speculative philosophy and his new method are admittedly awkward bedfellows. "If the customary view of Bacon's scientific method is broadly correct," Rees offers, "then he believed the only way to achieve a proper reconstruction of the natural sciences lay through the application of inductive routines to bodies of scrupulously verified empirical data. Yet while developing the method he was busy weaving a speculative chemical philosophy" that "relies heavily on relatively undisciplined conjecture and to that extent seems to fly in the face of the procedural recommendations for which Bacon gained posthumous fame (or notoriety)."⁶⁶ But we will misunderstand Bacon, Rees says, if we fail to see that "his speculative enthusiasms were coextensive" with his work on method, that his "method and speculative philosophy were . . . born

⁶⁵ *OFB* XI, xxxvi.

⁶⁶ Graham Rees, "Matter Theory: A Unifying Factor in Bacon's Natural Philosophy?," *Ambix* 24 (1977), 118-19.

at the same time, grew up together and exhibited the same durability.”⁶⁷ Somehow the two must fit together.

Rees puts forward Bacon’s “matter theory”—itself part “conjectural” and part “a child of induction”—as a possible mediating link. In the end, though, his solution dissolves into biographical and psychological conjecture. “Perhaps in the beginning,” Rees speculates, “Bacon regarded his speculative and methodological activities as complementary or was unaware of the contradiction between them simply because neither had been developed to the point where the contradiction could make itself felt with any force,” and maybe, by the time Bacon realized the contradiction, he “had become so attached to his speculative philosophy that he was loath to relinquish it.”⁶⁸ His late-developed matter theory only “mask[ed]” the implicit contradiction between Bacon’s methodological and speculative philosophies, providing a “psychological unity” where no “logical” unity was to be had.

Elsewhere, Rees pursues a more promising line. He tries to resolve the tension between the two by treating Bacon’s speculative philosophy as a set of provisional conclusions achieved without the guarantee of his method. *Provisional* is the qualification that is supposed to harmonize Bacon’s speculative philosophy with his method.

It is true that Bacon leaves room for such anticipations in his Instauration program. He reserves the plan’s fifth part for “things which I myself have either discovered, proved or added, yet not by the proper process and prescriptions for interpreting, but by those same ways of using the intellect which others usually employ in the business of inquiring and interpreting.”⁶⁹ He sometimes suggests that these anticipations could eventually be tested and certified according to the legitimate

⁶⁷ Rees, “Matter Theory: A Unifying Factor in Bacon’s Natural Philosophy?,” 121-22 and 119.

⁶⁸ Rees, “Matter Theory: A Unifying Factor in Bacon’s Natural Philosophy?,” 122.

⁶⁹ *DO* (OFB XI, 43).

method's established rules.⁷⁰ But in *Distributio opera*, Bacon describes them as concessions, a “temporary measure,” the “interest payable until the principle can be had” and “things of use” discovered along the way.⁷¹ This description hardly suggests the kind of comprehensive speculative philosophy that Rees uncovers, and it is hard to see how Bacon's “elaborate, speculative guess at the kind of science the method was expected to create” could be verified by his method without tracing those speculative theories all the way back to primitive notions and axioms.⁷² Calling them *provisional* also does little to distinguish Bacon's anticipations from the ancients'. Ancient dialectic was itself provisional. If Bacon's anticipations are any better than theirs, it could only be because he had, by means of his method or by means of the methodological thought that leads to his method, freed himself from their prejudices and the mind's distorting Idols.

By exhuming Bacon's speculative philosophy, Rees allowed us to see anew the problem of the unity of Bacon's natural philosophy. He recognized, to his great credit, that he had not solved it. But he did point, fairly early on, in the direction of its solution. We need, he knew “much more research into the very earliest stages of Bacon's philosophical career and detailed study of the growth of his ideas thereafter,” though not, as he likely thought, the kind of *historical* and *biographical* research he pursued. We should instead, as I have suggested, begin where Bacon himself begins.

To bring Bacon's idea of nature to light, I have had to give an unorthodox account of its genesis. My story differs from others in this, that I have tried to bring out the “mediated” character of his idea of nature. I describe this mediated character more fully in the first chapter, but here it is briefly. Bacon's idea of nature is neither the sort of notion abstracted directly from experience nor a notion formed by reflecting philosophically on ordinary experience. He instead achieves his new idea

⁷⁰ See *PID* (*SEH* III, 547). See also Graham Rees's comments at *OFB* XI, xix and *OFB* VI, xix, and xxxvi-xxxvii.

⁷¹ *DO* (*OFB* XI, 43-45).

⁷² *OFB* XI, xxxvi-xxxvii. Cf. *NO* I §§15-18 (*OFB* XI, 69-71).

of nature mediately, through a critical reflection on old attempts to philosophically comprehend ordinary experience. Socrates talked to ordinary folks to philosophically test their unphilosophical opinions. Bacon's thinking about nature and method—his “methodology”—are one extra degree removed from ordinary experience: he theorizes about the old philosophical theorizing of experience.

If this picture of Bacon's working procedure seems at odds with his own methodological prescriptions, that's because it is. An “unskilled” inquirer “first searches out and reads over what others have said on the matter; then he brings his own thinking to bear and, with much agitation of mind, excites and as it were invokes his own spirit to deliver its oracles to him,” he complains, and yet he could be describing his own discovery of method.⁷³ He surveyed the old philosophers and concluded that they were poor students of nature. His conclusion depends on an insight into shortcomings of the old philosophers and their “natural” foundation in the character of human reason rather than any insight into nature itself. Bacon's new organon means to replace Aristotle's old organon and so also the idea of nature that shaped it. If nature is as Aristotle supposed, Aristotle's science would be the appropriate way to study nature. Since Aristotle's science has failed to discover nature, Aristotle's idea of nature must be false. Knowing that Aristotle mistook nature does not on its own tell us what nature is. Bacon determines his new idea of nature *dialectically*, by negating elements of the old idea of nature. The upshot is that Bacon's idea of nature is not a conclusion—provisional or otherwise—of his science, but its presupposition. It is in a special sense an *anticipation*.

⁷³ NO I § 82 (OFB XI, 129-31).

Overview

In closing, I want to briefly map the road ahead. I will follow Bacon's own critique in structuring our investigation. His new way of contemplation differs from the ancients' way of contemplation, he says, "in three ways especially: in its end, order of demonstration, and the inquiry's starting point."⁷⁴ After canvassing the Instauration's first, "destructive" part in the first chapter, I will dedicate one chapter to each of these three critiques. Since it will also be useful to keep in mind Bacon's whole project, the function of each part, and the relations between its parts, I will also use Bacon's Instauration plan as a second principle of organization.

The first chapter takes up the Instauration's first, backward-looking part, especially in relation to its second part, the method itself. In one way, then, this first chapter offers a more rigorous and better documented argument for the approach I have outlined here in the introduction. And because the Instauration's first part has been neglected and misunderstood, I have thought it necessary to defend my characterization of it and its place in Bacon's program. To that end, I comment on the editorial decisions that helped obscure the true scope and purpose of the Instauration's first part. These comments continue my reflections, here in the introduction, on the interpretive difficulties that have bedeviled so much Bacon scholarship.

But my real aim in the first chapter is to exhibit the structure of Bacon's *refounding* of philosophy and to draw out some of its consequences for our question about his idea of nature. I first try to draw out the paradoxical nature of Bacon's demand to begin again the work of the mind, to lay a new foundation from the very beginning. I liken Bacon's call for a new beginning to Descartes's attempt to find an indubitable truth on which to rebuild philosophy. But in Bacon's case, the very defects that make an artificial method needful also make the discovery of that method

⁷⁴ *DO* (OFB XI, 29).

impossible. The paradox dissolves if we distinguish the “methodological” thought that leads to method from the method itself. The method is not, as Bacon pretends, the birth of Time. Both the method and Bacon’s new idea of nature grow out of his refutations—of philosophies, of demonstrations, and of native human reason.⁷⁵ The Instauration’s first, “destructive part” is the necessary preparative for the method itself.⁷⁶

In the final sections of the first chapter, I survey some of Bacon’s strategies for solving the rhetorical, political, and “dialogical” problems inherent in his refounding of philosophy. In doing so, I catalog the ways Bacon relates his innovations to the Socratic and Christian traditions. If we piece them together, we get Bacon’s idiosyncratic history of philosophy. I show how this historical argument tries to refute and transform the tradition. I go on to show, though, that Bacon’s real critique is *practical* or *prudential*. Taken together, these reflections will prepare us to see how Bacon’s rejection of certain key philosophical assumptions and biblical beliefs, especially assumptions and beliefs about the goodness of nature, shape his new understanding of nature and man.

In the second chapter, I take up Bacon’s critique of the ancients’ starting point. All knowledge of nature begins with experience. Socratic philosophy begins with “ordinary” experience. But because the mind unguided by method is no match for nature’s subtlety, Bacon constructs an artificial or “methodological” starting point as a substitute for ordinary experience. He uses three artifices in particular to construct the experiential basis of his new philosophy: a new natural history, a set of practices for extending experience—what he calls *experientia literata*—, and experiments that reveal nature by forcing it out of its ordinary course. I try to show how each of these artifices is guided by Bacon’s anticipations of nature.

⁷⁵ DO (OFB XI, 35). Cf. NO I §115 (OFB XI, 173).

⁷⁶ NO I §115 (OFB XI, 173).

The third chapter turns to Bacon's critique of the ancients' order of demonstration. The argument at first seems to be about the logical process by which we generalize axioms from the particulars of experience. While the ancients leaped to first principles and final causes, Bacon urges a more gradual, stepwise induction from particulars to low-level or intermediate axioms. Really, though, Bacon's critique of the order of demonstration concerns the proper object of scientific knowledge. Scientific knowledge is not, as the Plato and Aristotle had thought, knowledge of substantial forms, but instead knowledge of the species-neutral laws—the “appetites” of matter—that universally govern bodies in motion. Above all, reason's erotic search for true principles and first and final causes must be curbed. Socratic philosophy lost itself in aporetic wonder, searching for causes that do not exist or cannot be found. Bacon proposes to discipline reason with a dogmatic method—a “methodological materialism”—that concludes with high-level “universals”—laws that reason must regard as “positive” and not “really capable of having a cause.”⁷⁷

Finally, in the fourth chapter, I turn to the critique Bacon thought most fundamental, his critique of the end or goal of ancient contemplation. The common ground uniting Socratic contemplation and Christian contemplation forced Bacon to prosecute his case circumspectly. To draw it out, I look first to his interpretation of the Prometheus myth in *De sapientia veterum*, using what hints I find there to better unlock his account of the human good and the role of charity in the *Advancement of Learning*.

The ancient goal of contemplation depends on trust in nature's goodness. Man must be the kind of being that can know nature, and nature must be the kind of thing that can be known. Man's true needs must be satisfied well enough by nature or by God to afford him the leisure such

⁷⁷ NO I §48 (OFB XI, 85).

contemplation requires. Ancient philosophy's theoretical and practical failures suggest that neither nature nor man is as the Socratics supposed.

Once Bacon undercuts the idea of nature as a beautiful cosmos or the very good creation of a perfectly powerful and benevolent God, we can see man's true neediness. Ignorance and impotence are man's lot. We do not know as much as we would like, and we cannot do all that we would, because *Mind* fails to grasp *Things*. Unable to trust himself to nature's or God's provident care, man must provide for himself. Only by his arts and his science can he relieve his own miserable estate. Only by his arts and his science can man become a god to man, master nature, and bring about the "Kingdom of Man."

Chapter One

Bacon's Refounding: The Methodological Foundation of Bacon's Method

This first chapter is preparatory. In chapters two, three, and four, I will work out the idea of nature that takes shape in Bacon's critique of the philosophical and biblical traditions. But to open the way and equip us for what is ahead, I need to say something about the peculiar nature of Bacon's *refounding* of philosophy.

In the first three sections (1.1 - 1.3), I take up the paradoxical character of Bacon's new beginning. On his telling, the mind errs in its first motions, recklessly abstracting notions from things. These confused notions are the shaky foundation on which all our knowledge is built. Ancient dialectic served only to entrench those "radical errors."¹ From the ancients' rotten roots grew a diseased science. Thus "it is useless to expect great growth in the sciences from the superinduction and grafting of new things on old; instead the instauration must be built up from the deepest foundations, unless we want to go round in circles forever, with progress little or pitiable."² We must instead "do the whole work of the mind all over again, and from the very outset stop the mind being left to itself but to keep it under control, and make the matter run like clockwork."³ Yet the very rift between mind and nature that makes method needful also seems to make the discovery of method impossible. To resolve this apparent paradox, we have to go behind the method itself to the *methodological* thought that grounds it.

¹ NO I §30 (OFB XI, 75).

² NO I §31 (OFB XI, 77).

³ NO Preface (OFB XI, 55).

As I suggested in the introduction, Bacon's new beginning is not where he leads us to expect it, in his new method, but rather in his critique of the received learning, and especially his critique of Socratic philosophy. Because that critique has been neglected and its place in Bacon's program misunderstood, I have thought it useful to recapitulate the Instauration's first, critical part and draw it into relation with the Instauration's other parts. James Spedding, an editor of the nineteenth-century edition of Bacon's complete works, gave little weight to those backward-looking texts—the first book of *Novum organum*, included—in which Bacon prosecutes the old philosophy. On his telling, the Instauration's first part was an after-thought, the byproduct of a failed attempt to court the king's favor. The “abandoned” works that belong to it, because they are engrossed in those “defensive measures” Bacon's insecurities drove him to, are of merely *biographical* interest. In 1.4, I argue against Spedding's characterization and show how his disagreement with Robert Ellis, his co-editor, points to a juster characterization. The Instauration's first part contains, as Ellis put it, “whatever was necessary to be known before the new method could be stated.”⁴ Put another way, it contains the *methodology* that grounds Bacon's method and so, too, the idea of nature his method presupposes. The Instauration's first part is where we should look, therefore, to see how Bacon refigures and transforms the old idea of nature into his new idea of nature.

Having trained our attention on the Instauration's first part, I catalog and categorize, in 1.5, the texts that I believe belong to the Instauration's first part and briefly describe the rhetorical, political, and “dialogical” problems they try to solve. Sections 1.6 - 1.8 take up Bacon's solution to those rhetorical or political problems; sections 1.9 - 1.11 take up his solution to the dialogical problem.

⁴ Robert Ellis, Preface to *Valerius Terminus* (SEH III, 202).

Bacon's solution to the rhetorical or political problem are interesting in their own right, but their chief interest for us is instrumental. For considering Bacon's rhetorical or political situation will help us bring to light the true character of Bacon's critiques of the old philosophers. Instead of changing attitudes—youthful invectives and abusive broadsides giving way to more measured reproofs giving way, in turn, to concessions and accommodations—we will see Bacon's shifting tactics, the way he tailors his speech to his audience (1.6). We will weigh Bacon's proposal to divide philosophy into two tribes, a philosophy that commands nature and a philosophy that commands assent (1.7). And we will see Bacon weave together an unorthodox version of salvation history with his peculiar retelling of the history of philosophy as a way of appropriating the tradition, retrofitting the past in light of the future he projects (1.8).

Having learned to read Bacon, we can tease out the “common accusation” and the “common guilt” that incriminates the old philosophers and the theologians alike. He cannot refute Plato and Aristotle because he denies their principles and methods of demonstration. The impossibility of such a critique is one part of Bacon's “dialogical” problem. He offers instead a *prudential* critique of Socratic philosophy (1.10) that prepares the more theoretical critique of the old science's starting point and order of demonstration. The nub of that theoretical critique is Bacon's claim that the ancients *anticipated* nature. He proposes instead to *interpret* nature by means of his new method, but his new method depends on his own anticipations—what I call his regulative *idea of nature*—shaped by his prudential critique of Socratic philosophy (1.11).

1.1 The Origin of Bacon's Method and the Demand for a New Beginning

Francis Bacon's whole philosophy grows out of his insight into the rift between mind and nature. He "knew for a fact" that the intellect is responsible for its own ignorance and that man suffers "countless disadvantages" because of "his manifold ignorance of things." He argues that, "taken as a whole, human reasoning as applied to the investigation of nature is not at all well sorted and set up, but like some stately pile with no foundations." So philosophy must be rebuilt from the ground up. "[T]he only course left," he says, is "to try to do everything again with better assistance and undertake a wholesale Instauration of the sciences, arts and all human learning, raised on proper foundations."⁵

Judged by his own statements, Bacon's founding act and the novelty of his science is the discovery of a new tool, a method or set of instructions that aim to restore the "commerce between Mind and Things."⁶ The problem is, the very thing that makes method needful also makes its discovery problematic. We cannot trust ordinary human reason nor the ancient philosophers' attempts to prop it up, but these are the only tools we have to lay the new foundation. Method seems to be required for the invention or discovery of method.

René Descartes faces a similar problem. Before he discovers an indubitable truth about his own existence, even before he takes up his program of methodical doubt, Descartes resolves on a three- or four-rule method and a pair of criteria he will use to judge his ideas. "Indeed," he says, "I did not wish to begin by rejecting completely any of the opinions that might previously have slipped into my beliefs without having been introduced there by reason until I had first spent enough time planning the project of the work that I would undertake, and seeking the true method of attaining

⁵ *IM Proem (OFB XI, 3).*

⁶ *IM Proem (OFB XI, 3).*

the knowledge of everything which my mind would be capable.”⁷ He will reject any judgment that lacks self-evidence, keeping only those judgments that present themselves with such *clarity* and *distinctness* that he could not doubt them.

These rules and criteria are not themselves self-evident. Initially, his method is willed as much as reasoned: he “chooses” and “firmly resolves” on it. In time, the results of Descartes’s method justify the confidence he places in it. In just two or three months, he had solved, with the help of his method, many problems he previously believed to be very difficult. Those successes gave him the courage to publish his results and try his mathematical method on the more intractable problems of philosophy. His mathematical studies also habituated him to conceive of things more sharply and clearly. He is better than he once was at perceiving the self-evidence of things. That his perception becomes sharper shows that self-evidence has a subjective component. The radiant truth of a thing must still be perceived, and some men are better able to perceive it than others. Self-evidence, and the philosophical decision to methodically resolve notions and judgments to self-evidence, then, are not themselves self-evident. Descartes’s method cannot methodically certify itself.

Bacon’s new logic and Descartes’s method share a common structure. If you begin with something simple and true, and if you proceed from that certain starting point by small, careful steps taken in the right order, you will arrive at something previously unknown but certainly true.

Descartes compares his rules to geometrical proofs:

Those long chains of reasoning, completely simple and easy, that the geometers customarily use to attain their most difficult demonstrations had given me the occasion to imagine that all things that can fall under human knowledge are interconnected in the same way, and that provided only that one abstains from accepting any as true that is not, and always adheres to

⁷ René Descartes, *Discourse on Method*, trans. Richard Kennington (Newburyport: Focus Publishing, 2007), 24. Subsequent references will cite part and page number.

the order required to deduce them from one another, there cannot be any so remote that it cannot finally be reached, nor so concealed that it cannot be discovered.⁸

Beginning with something known or supposed, the geometer can string together immediately evident deductions. After a long chain of such deductions, each of which is itself certain, he arrives at a conclusion whose truth is guaranteed by the certainty of the starting point and each of the small, intermediate steps. In outline, then, there is nothing especially novel about Bacon's and Descartes's reforms (unless it be Bacon's new form of induction, meant to take the place of the geometers' and philosophers' deductions). Their innovations lie not in the general scheme, but in choosing appropriate starting points and generalizing and applying the method to all philosophical problems.

The real problem, then, is finding a reliable starting point.⁹ Suitable starting points are not so easy to discover. Euclid does not tell us how he arrived at the definitions, axioms, and common notions that ground his constructions and proofs. His definition of *point*, for example, is not self-evident or common-sensical. Bacon, for one, accused the ancients of "kicking over the traces" of their intellectual work. He could not believe that what has come down to us revealed the ancients' own order of discovery. Like builders, they took down the scaffolding they had used once they finished the building, leaving us to wonder how anyone could construct such magnificent structures. Those definitions, axioms, and common notions may be first principles in the deductive proof system and, in a book like Euclid's, first also in the order of presentation, but they cannot be first in the order of discovery. If ancient geometry can teach us *how* to proceed, it is mostly silent about *where* to begin.

For a dialectical philosopher, uncertainty in one's starting points is not a problem because even grossly mistaken opinions point toward the truth. Those starting points—those *endoxa*, the

⁸ Descartes, *Discourse on Method* II, 25.

⁹ Descartes wants an *indubitable* or *certain* starting point. Bacon's standard is lower. He will settle for a *reliable* or a *verifiable* starting point. Bacon's starting points need not be *certain* because small errors will be corrected in the gathering of natural histories and through the inductive process.

authoritative opinions handed down to us by wise men—will be rationally tested and then rejected, refined, or provisionally accepted. They are starting points only in the order of discovery. So, for example, Plato’s Socrates does not take those opinions as foundations to build on, but rather as “steppingstones and springboards” to reach, eventually, “what is free from hypothesis at the beginning of the whole.”¹⁰ The sure foundation is not, for the dialectical philosopher, what you begin with; it is what you reach last. What is last for us as inquirers is first in nature or being, a true beginning, a first principle. Our knowledge of it does not depend on the hypotheses we used to reach it but, in a curious turn, our knowledge of those hypotheses is now made to depend on the non-hypothetical beginning they allowed us to reach—a kind of after-the-fact dependency. Thus dialectic turns Bacon’s and Descartes’s architectural metaphors on their heads. It is as if Socrates climbed the “stately pile without foundation,” adding, removing, and rearranging bricks without consulting an architect’s plans. When he laid the last brick, the stately pile had somehow become a handsome, solid structure held together by a capstone.

Bacon and Descartes want instead a philosophy supported from beneath—not capstone but cornerstone construction. Each brick should rest on the bricks below it. To begin, they need to lay that first brick. All that Descartes and Bacon require is what, it seems, is impossible in the work of the mind: an absolute beginning.

¹⁰ Plato, *Republic*, trans. Allan Bloom (New York: Basic Books, 1991), 511b.

1.2 The Greatest Birth of Time

For Bacon and Descartes, reason's demand for an absolute beginning requires also an absolute beginning in history. "Because we have all been children before being men," Descartes laments,

and because it was necessary for us to be governed for a long time by our appetites and our preceptors, which were often contrary to one another, and neither of which perhaps counseled us always for the best, it is almost impossible for our judgments to be so pure and solid as they would have been if we had had the entire use of our reason from our birth and had always been conducted only by it.¹¹

Bacon's doubts run even deeper. Even if we sprang forth fully formed we could not hope for the "pure and solid" use of our reason. The words we must use to think cannot be wholly our own, and even if we could each coin our own, private language based on our direct experience of the world, we would, unguarded by method, make a mess of the work. Descartes's hard biological fact is an equally hard historical fact. No philosopher ever philosophized in isolation, unburdened by what others thought. A philosopher cannot avoid taking a stance toward the tradition as he knows it. The dialectical philosopher is untroubled by his lateness. He depends, in fact, on those previous attempts, some philosophical and some not, to make sense of the world. Only Bacon's and Descartes's demand for a completely new and unconditioned beginning makes taking that stance a problem.

Reason cannot comprehend a genuinely new beginning in history. By definition, such a beginning has no cause and cannot be explained by some antecedent state or principles of historical change. It can only be a mystery, a miracle. Bacon presents his method as just such a new beginning.

¹¹ Descartes, *Discourse on Method* II, 22.

“Perhaps you wonder,” Bacon muses, “how I came to think of it.”¹² Indeed, the invention of the art of invention is a cause for wonder.

Like most wonders, Bacon’s discovery at first strikes us as incredible. Bacon himself signals the strangeness of his project’s beginning with an oft-repeated trope: his discovery, he says, is a birth of time more than talent. Here are Bacon’s words from the letter he wrote dedicating the *Novum organum* to King James:

And the things I speak of are quite new in their very kind [*Sunt certe prorsus noua; etiam toto genere*], but are framed on an extremely ancient archetype, i.e., the very world itself, and the nature of things and of the mind. And I frankly admit that I myself am certainly inclined to regard this work more as a birth of time than of talent. For the only remarkable thing in it is that its beginnings and such deep suspicions about received doctrines should have entered anyone’s head. All the rest follows naturally enough. And doubtless there is an element of chance (as I say) and an accidental quality no less in what men think as in what they do or say. But I wish the element of chance I speak of to be understood to mean that if there be any good in what I propose it should be attributed to God’s infinite mercy and goodness, and the blessedness of Your Majesty’s times.¹³

Time is only one item in a long list of possible causes. If not Time, perhaps it is “chance (as I say),” or, as Bacon wishes us to understand him, “God’s infinite mercy and goodness” and “the blessedness” of his king’s times.¹⁴ Or perhaps—a fifth possibility—his innovations, though quite new, are nothing more than faithfully restored copies of extremely ancient archetypes, the very world itself and the human mind. Unable or unwilling to account for the source of his insight, Bacon leaves us to resolve for ourselves his list of possible causes.

We should regard with suspicion Bacon’s winking suggestion that his project—the discovery of the art of discovery that is supposed to free us from the reign of chance—is itself a chance

¹² *RPb* (F, 120).

¹³ *NO* Epistle Dedicatory (*OFB* XI, 7).

¹⁴ At *NO* I §122 (*OFB* XI, 185), Bacon makes a point of how often he says his work is a birth of time. Time here is identified with chance, and no mention is made of Providence of James’s happy reign. At *NO* I §78, Bacon’s innovations are “more a matter of good luck than any superior genius” and “ought to be seen more as a birth of time than of talent.” (*OFB* XI, 123). See also *RPb* (F, 120).

result.¹⁵ Nor should we put much trust in his profession of faith in God's infinite mercy and goodness.¹⁶ Bacon's identification of chance and Providence—of what Bacon says and what he wants us to understand—should make us wary of both. Besides, the advancement of learning has neither the sureness of outcome nor the smoothness of progress that mark things providential.¹⁷ That men's needs have been so ill met is rather a sign of a deficient providence, and so Bacon takes on himself and his instauration a kind of providential responsibility, to establish the Kingdom of Man and provide for the relief of man's estate. Good government and with it peace and prosperity, if they are not merely reducible to God's infinite mercy and goodness, are more likely results of

¹⁵ *RPh* (F, 120): "To think of the whole process of discovery and invention being left to the obscurity of tradition, the giddy whirl of argument, the billows of chance, and the devious course of mere experience!"

¹⁶ But see Sidney Warhaft, "The Providential Order in Bacon's New Philosophy," in *Francis Bacon's Legacy of Texts: the Art of Discovery Grows with Discovery*, ed. William A. Sessions (New York: AMS Press, 1990), 151-67: "It would seem undeniable from all of this—simplistic and occasionally distorted though the treatment has been—that Bacon not only believed in the Christian idea of providence, but also acquiesced in most of its fundamental tenants" (156). His case rests on an enumeration of appeals or invocations of providence scattered through Bacon's writings without a Baconian care for negative instances: "That Bacon believed in providence in general is easily demonstrated, as he refers and appeals to it frequently in his writings" (153). Nor does Warhaft pay any attention to the rhetorical contexts of these invocations. He dismisses any such doubts: "It may be that much of what he has to say is perfunctory or casual or incidental—certainly he often seems to take the validity of the commonplace for granted and to seek refuge in the conventional. But he was thoroughly familiar with all of the conventions, and if one senses the mind of the lawyer behind some of his religious professions, that does not necessarily bring his sincerity into question." (157). Warhaft is surely right that "it would hardly appear to be profitable or proper at this point to speculate on the possibility that Bacon made his admissions of belief with tongue in cheek, that he was more intent on convincing his critics of his orthodox than in divulging the truth about himself" (157), but neither should we dismiss the possibility out of hand. The out-of-hand rejection is warranted only if one begins by believing the case Warhaft says is so easily demonstrated. Sensing the possibility that his reader will be unsatisfied, he points us to greater authorities. We did not need the first half of his essay, it turns out: Rawley told us that Bacon was religious, and Spedding "has affirmed this evaluation in convincing detail" (157).

¹⁷ *NO I* §93 (*OFB* XI, 151). Compare, for example, *VT* (*SEH* III, 220-21): "This is a thing I cannot tell whether I may so plainly speak as truly conceive, that as all knowledge appeareth to be a plant of God's own planting, so it may seem the spreading and flourishing or at least the bearing and fructifying of this plant, by a providence of God, nay not only by a general providence but by a special prophecy, was appointed to this autumn of the world: for to my understanding it is not violent to the letter, and safe now after the event, so to interpret that place in the prophecy of Daniel where speaking of the latter times it is said, *Many shall pass to and fro, and science shall be increased*; as if the opening of the world by navigation and commerce and the further discovery of knowledge should meet in one time or age." Note that Bacon cannot decide whether providence should be credited with the spreading and flourishing, or just the bearing and fructifying of knowledge, that he does not say that his interpretation of the prophecy is not true but only "not violent to the letter," and that his interpretation is safe only after the fact. See also *Essays* "Of Fortune" (*OFB* XV, 124), where Bacon says that "All Wise Men, to decline the Envie of their owne vertues, use to ascribe them to Providence and *Fortune*; For so they may the better assume them."

Bacon's project than its conditions, and one could at least wonder if Bacon does not think the founder of the project to master nature an abler ruler than any hereditary or conquering king.

Bacon's trope is also more than humble posturing. Method is needful because the mind is weak and wayward, because it has become or always was separated from things and needs for its good functioning aids and props. Because the human intellect is author of its own difficulties, method aims "from the very outset to stop the mind being left to itself but to keep it under control, and make the matter run like clockwork."¹⁸ Little or nothing should be left to the force of wit or intellect. To draw a straight line or describe a just circle a man should rely not on a steady hand and a keen eye but a straightedge and compass.¹⁹ The machinery of method is needed to correct and increase the force of the naked intellect, to make it equal to the task of conquering nature. The ancients, too, knew that the human intellect required aids, but the old organon offered too little help and too late. Bacon likens ancient dialectic to gymnastics: men may grow stronger and more limber through exercise, but these calisthenics serve only to entrench and obscure the mind's native and inveterate Idols. So deep-seated are these Idols that reason is not even competent to judge itself.²⁰ As we shall see, Bacon's decisive move is to argue that the ancient way of contemplation and the native use of the human mind are of a piece, that at bottom they both suffer from the same errors. The mind naturally distorts reality; we require an art—a method, that is—to secure the commerce of mind and things. Everyday speech, since it does not articulate the world as it truly is, is not itself natural. Bad abstraction, artless art, produces our poor primary notions. What we need is a better art. And so, Bacon concludes, "there never was the slightest hope that the errors which have flourished and will forever flourish would (if the mind were left to itself) put themselves right one after another

¹⁸ *NO* Preface (*OFB* XI, 55).

¹⁹ *NO* I §61 (*OFB* XI, 97), *NO* I §122 (*OFB* XI, 185). See also *RPb* (*F*, 118-19).

²⁰ *IM* Preface (*OFB* XI, 25). See also *NO* I §33 (*OFB* XI, 77).

either by native force of intellect or the help and support of dialectic.”²¹ Method would not be needful if the mind were capable of discovering it. Error-prone and undisciplined, mind is a patient unable to heal himself, a diseased tree that bears no good fruit. Bacon was right, then, to deny that the native human intellect—his included—could in any simple way be the inventor or discoverer of method.

And since the unaided human intellect has no sure access to the world as it truly is, Bacon’s new way cannot be framed on that “extremely ancient archetype, i.e., the very world itself and the nature of things.”²² Only the methodical study of nature, Bacon insists, reveals nature as it truly is. Without the help of Bacon’s reason-guided induction, “the fabric of the universe looks in its construction like a labyrinth, where we find everywhere so many blind alleys, such deceptions, and misleading signs and such oblique and intricate convolutions and knots of nature.” We need, like Theseus, some “clue” or “sound policy” to solve the labyrinth. “Before we can get at the more distant and hidden aspects of nature,” Bacon counsels, “we are necessarily obliged to bring in means of bettering and perfecting the exercise and practice of the human mind and intellect.”²³ Nature itself cannot guide us before the discovery of the true method of interpretation restores the commerce between mind and world. Nature’s pattern is available only after we build the machine to discover it.²⁴

If not the result of chance or providence, good government, strength of intellect, or nature itself, we are left to conclude with Bacon that his new method is more truly a birth of time. Time,

²¹ *IM* Proem (*OFB* XI, 3).

²² *IM* Epistle Dedicatory (*OFB* XI, 7).

²³ *IM* Preface (*OFB* XI, 19-21).

²⁴ See also *RPb* (*F*, 103): “As a last recourse I might try to establish my positions on the basis of sense evidence and experience. But, if I do this, we are back where we began. I have made a special point about the necessity of a preliminary preparation of the mind. I must not forget this and start off in the opposite direction. I must not attempt a direct, abrupt encounter with things themselves, for they need to be approached by opening up and levelling a special path on account of the inveterate prejudices and obsessions of our minds.”

says Bacon, is the greatest innovator, the “author of authors and indeed of all authority,” and yet it is a darkling cause.²⁵ Despite our many commonplaces about time’s powers, it is in no way obvious how time could bring Bacon’s new science to be.

Time sometimes looks like providence. On Bacon’s interpretation of Daniel’s prophecy, the age of global exploration will coincide with an unprecedented increase in knowledge.²⁶ Now that Magellan has circumnavigated the terrestrial globe and Columbus has discovered a new world, the time is ripe for a Columbus of the intellectual globe.²⁷ And, as is fitting, that greater Columbus humbly and heartily prays that “God the Father, God the Word, and God the Holy Ghost . . . will think fit through my hands to endow the human family with new mercies.”²⁸ God’s providential plan, revealed to Daniel, is to be accomplished through his servant’s instauration of the sciences, and we (who are neither prophets nor authoritative interpreters of others’ prophecies) are left to wonder if God’s providence is not, in this case and on Bacon’s own account, a superfluous principle.

Other times, Time looks more like fortune. Pre-modern men made much of fortune’s wheel: he who prospers today tomorrow will fall. Bacon’s own imagery flattens fortune’s wheel. Like a river, time has sunk its weightier matter, carrying to us only antiquity’s flotsam.²⁹ No recovery is vouchsafed time’s wrecks. In his nascent history of learning, Bacon tells us that periods in which learning flourished have been few. Every earlier advancement of knowledge has been followed by a regression into ignorance; every enlightenment has given way to a dark age. Progress is not natural and advancements, when they come, are never secure. Time’s innovations, after all, need not be improvements. The good, Bacon tells us in his *Essays*, is a forced motion. Our natural motion is to ill

²⁵ NO I §84 (OFB XI, 133).

²⁶ *Daniel* 12:4: “Many shall pass through, and knowledge shall be increased.” The prophecy adorns the frontispiece of *IM*. See also NO I §93 (OFB XI, 151).

²⁷ See, for example, NO I §84 (OFB XI, 133).

²⁸ *IM* Preface (OFB XI, 21-23).

²⁹ See, for example, NO I §71 (OFB XI, 115) and I §77 (OFB XI, 121).

“and if time of course alter things to the worse, and wisdom and counsel shall not alter them to the better, what shall be the end?”³⁰ Bacon’s program for the perpetual advancement and proficiency of learning cannot simply be left to that great author, Time. For Time also brings Death, and so Bacon rushes to publish lest his discoveries die with him. No one has thought them before, and there is no telling when they might be thought again.³¹ To restore man to his rightful dominion over nature, the sound government of learning and a “true succession of wits” must first conquer the vicissitudes of time.

Time sometimes stands in for experience. And so we hope that time will compensate our loss of vigor with something like wisdom. Inverting the myth of the Golden Age and its long, sad decline, Bacon says that men reckon antiquity all wrong. By a truer accounting, it is we who are ancient, living in the “dotage and old age of the world.”³² To these late times is due the deference afforded old age, and it is we, because of our long and varied experience, because of all that we have seen and heard, from whom greater knowledge and more mature judgment should be expected. But time alone is no guarantee of a profitable accumulation of experience. Were we honest enough to take inventory and sum our receipts, Bacon cautions, we would discover our real poverty. “For if anyone looks more closely at all that variety of books in which the arts and sciences rejoice,” he warns, “he will find everywhere endless repetition of the same old stuff, put in different ways but lacking in originality, so that the whole lot, at first glance impressive, turns out on close inspection to be paltry,” and the most strenuous and careful study of our modest stores will not increase them one

³⁰ *Essays*, “Of Innovation” (*SEH* VI, 433). See also *AL* I (*OFB* IV, 24): “Surely, like as many substances in nature which are solide, do putrifie and corrupt into wormes: So it is the propertie of good and sound knowledge, to putrifie and dissolue into a number of subtile, idle, vnwholesome, and (as I may tearme them) vermiculate questions; which haue indeede a kinde of quicknesse, and life of spirite, but not soundnesse of matter, or goodnesse of qualitie.”

³¹ *IM* Proem (*OFB* XI, 5).

³² *NO* I §84 (*OFB* XI, 133). See also *NO* I §72 (*OFB* XI, 115) and *AL* I (*OFB* IV, 28).

jot.³³ Time sunk the weightiest achievements of the ancients, and what little it carried to us is riddled with error and is “not at all well sorted and set up, but like some stately pile with no foundation.”³⁴ The architectural metaphor becomes more powerful when transposed to the organic world. If our sciences were not like “plants torn from their roots . . . then what we have seen these two thousand years could never have happened, namely that the sciences have got bogged down and stayed pretty much where they were with no notable progress at all,” have in truth “flourished most with their first author, and gone into decline thereafter.”³⁵ All our useful discoveries are “more ancient than philosophy and the intellectual arts, so that (if the truth be told) when the rational and dogmatic sciences got started, the discovery of useful works came to a standstill,” the reward of dexterity and patience rather than any real knowledge of nature.³⁶ Without the method to vouchsafe our experience and the good government of learning needed to pass it from age to age, our belatedness is no real advantage. Greater age may give us little more than a dangerous and unjustifiable confidence in our too-narrow experience. More old men believe themselves wise than in fact are.³⁷ Time and experience are, in this sense, a burden rather than a boon, so much intellectual baggage to be overcome and a veil we have drawn between us and things themselves. Our well-stocked storeroom begins to look more like a junk pile, less a foundation to build upon than a slipshod construction we will need to raze in order to clear the ground for a sounder construction.

But Time has granted us one advantage over our predecessors. Our longer experience has been, if judged rightly, the experience of failure. The most “certain and noble” sign of the

³³ *IM* Preface (*OFB* XI, 11).

³⁴ *IM* Proem (*OFB* XI, 3).

³⁵ *NO* I §74 (*OFB* XI, 119).

³⁶ *NO* I §85 (*OFB* XI, 135).

³⁷ Consider also *NO* I §71 (*OFB* XI, 115): “[T]heir doctrines [those of the Greeks] were pretty much (as Dionysius put it rather well in derision of Plato) *the words of useless old men to inexperienced young ones*. . . . It also seems that we should not leave out the *Egyptian* priest’s verdict on, or rather prophecy concerning the Greeks, namely *that they were forever children, lacking both knowledge of antiquity and antiquity of knowledge*.”

barrenness of received learning is that “one can scarcely adduce after all this time a single experiment that tends to help and alleviate the human condition, and that can, properly understood, be truly credited to the speculations of dogmas of philosophy.”³⁸ Two millennia have been insufficient to resolve our old arguments or invent anything of real use, but the failure can confirm for us the emptiness and rootlessness of our previous efforts.³⁹ We can know what the ancients did not: that their way of inquiry leads to nothing better than futile and error-ridden generalities.

Time, then, is called to testify against the ancients, questioning their authority without insisting on Bacon’s own. “On the subject of authorities,” he says, “it is the height of pusillanimity to attribute everything to them but to deny time its rights which is the author of authors and indeed of all authority. For truth is rightly called not the daughter of authority but of time.”⁴⁰ To give Time its due means to protect ourselves against the “the siren song of reverence for antiquity, for the authority of those held to be philosophy’s great men” that has so bewitched us and “manacled men’s strength.”⁴¹ Bacon explicitly compares himself to Columbus, but in at least one way he is more like another famous sailor. Like Odysseus bound to the mast, he can pass by the Sirens with ears unwaxed, hearing seductive songs of philosophy’s great men without being wrecked by their errors.

And so the solution was there in Bacon’s list all along: neither chance nor providence, neither intellect nor nature, and not Time itself but Bacon’s “deep suspicions about received doctrines” and unaided reason’s ability to know the world lead him to the discovery of his new method. Wonder dissipates, but not entirely. All that is remarkable, he says, is that he could come to doubt those old doctrines and reason’s native power.⁴² From these doubts “all the rest follows

³⁸ *NO I* §73 (*OFB XI*, 117).

³⁹ *NO I* § 74 (*OFB XI*, 119).

⁴⁰ *NO I* §84 (*OFB XI*, 133).

⁴¹ *NO I* §84 (*OFB XI*, 133).

⁴² See, for example, *NO I* §78. (*OFB XI*, 123). In *NO I* §82 (*OFB XI*, 129), by contrast, Bacon finds it remarkable that no one has yet discovered a better route for the intellect: “Any mind rightly pondering the matter must

naturally enough.”⁴³ Bacon’s philosophizing, his discovery and justification of method proceeds in an unmethodical—an un-Baconian—fashion: Bacon’s own access to nature and the nature of reason is mediated by the ancient science he rejects; his non-dialectical science founded on a dialectical rejection of the philosophical tradition. Bacon’s true innovation is not the method, but the thinking that leads us to see method as needful. His most profound accomplishment is a new knowledge of our ignorance, achieved in his critique of previous attempts to know.

1.3 The Methodological Foundation of Method

For Bacon, then, the new philosophy really begins in a rejection of the old philosophy that justifies and gives shape to his new method. The same is true for Descartes. Again, Descartes’s case is clearer, and so I will begin with it.

Descartes offers a personal history (or, if we prefer, a “fable”) of his efforts to free himself from the tradition. From childhood, he was nourished on letters. He had an “extreme desire” to learn, believing he could “acquire a clear and assured knowledge of all that is useful for life” through his studies. He enjoyed every advantage: he lived in an age “as flourishing and fertile in good minds as any of the proceeding,” attended “one of the most celebrated schools of Europe” and was esteemed no less capable than his classmates, some of whom were “destined to fill the places of our masters.”⁴⁴ In short, he was perfectly placed to receive the very best the tradition had to offer.

be dumbfounded that no mortal has put his heart and soul into opening and laying down a route for the human intellect, a route running direct from the sense itself, and experience marshaled and well-grounded, but instead everything has been left to the blindness of traditions, the swirling bluster of arguments or the turbulent waves of chance, and experience undisciplined and ungrounded.”

⁴³ *NO* Epistle Dedicatory (*OFB* XI, 7). In the parallel passage in the earlier, unpublished *RPb*, Bacon credits his discovery to an uncommon humility. The two, as Socrates long ago discovered, are connected.

⁴⁴ Descartes, *Discourse on Method* I, 17.

Yet he found himself, at the end of his studies, “embarrassed” by the errors he was powerless to put right and the doubts he could not resolve.⁴⁵ The sure and useful knowledge he had “previously been led to hope for” is not to be found in the tradition.⁴⁶ Theology is superfluous, for “heaven is open to the most ignorant no less than to the most learned.”⁴⁷ Revealed truth suffices for salvation and (we infer) has nothing special to teach us about how to live in *this* life. Neither the historians nor the “ancient pagan” moral philosophers can teach us how to live well. They praised vices as virtues and urged men to seek fantastical and unattainable purposes. Because two thousand years have not been sufficient for the best minds to resolve their philosophical disputes, a prudent man will regard their probable opinions “almost as false.”⁴⁸ The other sciences, because they are built on philosophy’s “unfirm foundations,” have nothing solid about them.⁴⁹

And so Descartes, as soon as he could, “gave up the study of letters completely” and resolved “to seek no other science but that which could be found in myself, or else in the great book of the world.”⁵⁰ He travels and discovers in the morals and opinions of men “almost as much diversity . . . as I had previously found in the opinions of the philosophers.”⁵¹ The lesson pressed so forcefully by his school books and “the great book of the world” is the same: there is no opinion too “extravagant and ridiculous” to be “commonly received and approved by other great peoples.”⁵² Authority and custom guide our thoughts and actions just because we cannot rationally decide between the many irreconcilable opinions men hold. While this insight does not give us positive knowledge, it at least loosens the grip those opinions and customs have on us.

⁴⁵ Descartes, *Discourse on Method* I, 17.

⁴⁶ Descartes, *Discourse on Method* I, 18.

⁴⁷ Descartes, *Discourse on Method* I, 19.

⁴⁸ Descartes, *Discourse on Method* I, 19.

⁴⁹ Descartes, *Discourse on Method* I, 20.

⁵⁰ Descartes, *Discourse on Method* I, 20.

⁵¹ Descartes, *Discourse on Method* I, 20.

⁵² Descartes, *Discourse on Method* I, 20.

Descartes's predicament is no different than any other philosopher's. Socrates or Plato or Aristotle could have complained with equal justice that he had no sure way to decide between diverse and irreconcilable opinions. What is new in Bacon and Descartes is the resolution to bracket or reject those opinions and seek some firmer starting point. Where Socrates interrogates those authoritative opinions one by one, Descartes resolves to "freely" rid his mind of all received opinions and "to study within myself, and to use all the forces of my mind to choose the paths that I should follow."⁵³

But the general purgation is neither perfect nor swift. Of his schoolboy studies, mathematics alone has "certitude and evidence" and "very subtle discoveries that are of great service . . . for facilitating all the arts and reducing human toil."⁵⁴ What is certain and useful in mathematics, reduced to the three or four rules of his method, survives Descartes's methodical doubt. So do the three maxims of his provisional morality and "the truths of the faith, which have always been," Descartes assures us, "the first among my beliefs."⁵⁵ Weeding out the rest takes time. For nine years after making that initial resolution, Descartes "did nothing but roam here and there in the world, trying to be a spectator rather than an actor in all the comedies played there, and by making a particular reflection in each matter on what might make it questionable, and give us occasion for making mistakes, I meanwhile uprooted from my mind all the errors that had previously slipped into it." We get no particular accounting of those reflections to accompany his critical review of received learning. Nor do we hear what positive lessons Descartes drew from his travels, though he tells us that, "just as in tearing down an old house one customarily salvages the old materials to use in building a new one, so in destroying all those old opinions that I judged were badly founded, I made

⁵³ Descartes, *Discourse on Method* II, 21.

⁵⁴ Descartes, *Discourse on Method* I, 18.

⁵⁵ Descartes, *Discourse on Method* III, 30.

diverse observations and acquired many experiences that have since helped me to establish more certain ones.”⁵⁶

We don’t need the details because Descartes has done for us the hard work of extracting from the old learning whatever is worth keeping. We only need to hear enough to entrust ourselves to Descartes and make with him a new beginning. In fact there are two kinds of people who are unfit to take on a wholesale reform of their thoughts, Descartes says: those who, because they believe themselves more competent than they are, would be forever lost “once they had taken the liberty to doubt received opinions and to depart from the common path” and those who, because they know themselves less capable judges than others, “must be content to follow the opinions of these others, rather than seek better ones themselves.”⁵⁷ Descartes does not tell us how to recognize the man who justly judges himself to be superior to his fellows. If we were such superior men, we would not need his help. We are, like most men, best suited to follow. Unable to guide ourselves, we are in no better position to choose our preceptor. Luckily for us, Descartes has already successfully reformed his thought and solved with his new method some very difficult problems. So if we are prudent, we will abandon our old teachers and follow Descartes.

We can distinguish, then, between Descartes’s new method and the non-methodical thought that leads to Descartes’s new method, or what Richard Kennington calls Descartes’s “methodology, the more general guiding principles out of which comes the method proper.” His *Discourse on Method*—“that is, *logos* on method, that is methodology”—tells us in a folksy, biographical way how Descartes refounded philosophy. It invites us to join his revolution, not to make our own.⁵⁸

⁵⁶ Descartes, *Discourse on Method* III, 31.

⁵⁷ Descartes, *Discourse on Method* II, 23.

⁵⁸ Richard Kennington, “Interpretive Essay,” in *Discourse on Method*, 62.

Descartes's refounding answers in almost every particular to Bacon's own. Bacon, too, finds the tradition wanting, voicing a generation earlier Descartes's complaints about philosophy's shaky foundations and the consequent infirmity of the sciences built upon them. He, too, distrusts the historians as moral guides and decries the airy and fabulous constructions of the old moralists. Theology, he agrees, is best left to the theologians. Let the theologians enjoy undisputed their claim to expertise about the *next* life. Knowledge about *this* world, however, and man's good in *this* life rightly belongs to the new philosophy, and especially to its founder.

Like Descartes, Bacon discovers a method that allows learning to make a new beginning on firmer foundations. His discovery is just as enigmatic.⁵⁹ Those mysterious beginnings send us back, in both cases, to the methodological thought that grounds method and makes it seem needful. That methodological thought centers, for both, on an encounter with the ancient philosophical and biblical opinions which have governed men's actions and opinions. Both Descartes and Bacon wish to spare their followers the need to lay foundations. Each believes that his philosophical refounding of philosophy need not be repeated. We need not inspect our own beliefs one by one because Descartes's purgation yields for us a ready-made method. Bacon, for his part, asks us to entrust ourselves to him until we are ready to use our own judgment.⁶⁰ Their methods give us only the results of their philosophizing. To really understand their new beginnings, we have to look behind or underneath their methods to their pre-methodical or *methodological* philosophy and, in particular, at the critique of ancient philosophy and general human reason which grounds those new methods.

⁵⁹ "I think I have had," Descartes declares, "the good fortune during my youth to have fallen into certain paths that led me to considerations and maxims from which I formed a method." We have just seen that he counts himself among the rare few who can rightfully undertake a complete reform of his opinions. He was called to Germany during the Thirty Years' War, giving him time and occasion to develop his own philosophy. See the beginning of *Discourse on Method* II. He also benefits from settling in Holland, an orderly and peaceful place where one could be left alone while still living among other men. See the end of *Discourse on Method* III. Whether these helps should be attributed to providence or good government we don't know, but Descartes is dubious about what results when great things are left to chance. See *Discourse on Method* II.

⁶⁰ See *TPM* (F, 72). Cf. *NO* Preface (*OFB* XI, 59-61).

1.4 Reassessing the Plan's First Part

Bacon's *methodology* and his critique of ancient philosophy, if it has any place in the Instauration plan, could only belong to its first part. Unfortunately, the Instauration's first part has been underappreciated and misunderstood. To bring to light its true character, scope, and purpose, I need first to say something about its neglect.

James Spedding, the nineteenth-century editor of Bacon's collected works, had trouble imagining the role such a review could play in Bacon's new science. He dismissively called it "a by-thought suggested by a particular accident," the ascension of King James I. Spedding speculates that Bacon wrote the *Advancement of Learning* to interest the new king in his ambitious project of reform and win for it the institutional and financial support it required. Bacon's new philosophy was neither ready nor fit for the purpose, and James, an erudite man, would be "startled" by Bacon's plan to begin the work of the mind wholly anew. A well-sorted digest of the received learning, doubling as a kind of report on the state of the arts and sciences, would be more likely to win him over. Signs of hasty composition are, for Spedding, evidence that Bacon rushed the work to put it in James's hands "while his fortune was fresh, his course unsettled, his imagination excited and open to great ideas."⁶¹ Another important editor of Bacon's works, Michael Kiernan, concurs that Bacon undertook both the *Advancement of Learning* and its Latin expansion in order to "bond James to the project" of instauration.⁶² The review of learning, Spedding and Kiernan both agree, played no essential part in Bacon's larger designs.⁶³ It was a rhetorical effort calculated to win the favor of a powerful potential benefactor.

⁶¹ Spedding, Preface to *DAS* (*SEH* I, 417).

⁶² Kiernan, Preface to *AL* (*OFB* IV, liii).

⁶³ So strong was Spedding's conviction that he returned to the argument in a long note appended to Ellis's preface to *Valerius Terminus*. There Spedding is even more emphatic: "the writing of [the *Advancement*] was a by-product and no part of the work of the Interpretation of Nature as originally designed" (*SEH* III, 211).

Bacon's pitch was unsuccessful; James never proffered the support Bacon sought. Yet Bacon never abandoned the work, publishing some eighteen years later, while banished from court and with no real hope of altering his cause with the king, a much-enlarged translation of the *Advancement*. Long after he could hope to win the king's favor, and despite the urgent need he felt to bring other parts of the Instauration to a better state of completion, Bacon stayed devoted to his early-begun review. To explain this inconvenient history, Spedding supposes in Bacon an over-fondness for the product of his own pen. The plan of the instauration, on this telling, grows larger in order to make room for the already-published work:

There it was, however; and it contained such a quantity of the best fruits of Bacon's mind and so many new views bearing on the great reform which he meditated, that it seemed a pity not to find a place for it in the great work. This was easily done by enlarging the original design so as to include a preliminary survey of the existing state of knowledge; in which case the substance of the second book of the *Advancement* might do duty as the first part of the *Instauratio magna*.⁶⁴

Bacon's plan stands at six parts instead of five, that is, because he could not bring himself to orphan his failed petition for the king's support. Once he grants the review a place in the plan of the Instauration, however, Bacon commits himself to bringing it to some greater perfection.

Spedding's imagined history is a bad piece of detective work and does little to explain the material of the plan's first part or the history of its development. To support his conjecture, Spedding notes that the *Partis instaurationis secundæ delineatio & argumentum*—which, he says, “contains the earliest intimation of the entire scheme of the *Instauratio Magna*”—“proposes to distribute the whole subject of the Interpretation of Nature through the second, third, fourth, fifth, and sixth parts of the work, exactly as in the *Distributio Operis*; a place being reserved for a first part, though the

⁶⁴ Spedding, Preface to *DAS* (*SEH*, I, 418).

nature of its contents is not specified.”⁶⁵ That this first part is a mere placeholder, Spedding supposes, is evidence that it was a late addition appended to some more original design. He cannot fix the date of composition of *Partis instaurationis secundæ delineatio* with certainty, but there can be “no doubt,” he says, that Bacon composed it after *Valerius Terminus* and the *Advancement of Learning*, because, one guesses, neither makes reference to the *Instauration* plan. Accepting his co-editor’s upper boundary, therefore, Spedding can date *Partis instaurationis* “with tolerable confidence” to the year 1606 or 1607.⁶⁶ Spedding’s argument rests on a shaky assumption that Bacon, had he already conceived it, would undoubtedly have mentioned the six-part plan in the *Advancement*. But if, as Spedding believes, Bacon penned *Partis instaurationis* after 1605, after publishing the *Advancement*, he would have had a ready description of the first part’s contents, and if he composed it before publishing the *Advancement*, there is, on Spedding’s account, no reason for an unspecified first part to exist. Either way, Spedding’s argument fails.

Spedding’s co-editor, Robert Ellis, saw the development of Bacon’s Instauration plan differently. Not *Partis instaurationis* but *Valerius Terminus*, a work he dates to 1603, two years before the publication of the *Advancement*, “is the earliest type of the *Instauration*.”⁶⁷ The first ten chapters of the fragment, Ellis argues, correspond to the *Advancement*, and the rest to the first book of the *Novum organum*. Together, they supply “whatever was necessary to be known before the new method could be stated.”⁶⁸ Ellis takes *Valerius Terminus* to be the earliest type of the *Instauration* despite the fact that,

⁶⁵ Spedding, Preface to *De Augmentis Scientiarum* (SEH I, 418). See also Spedding, Preface to *Partis Instaurationis Secundæ Delineatio et Argumentum et Redargutio Philosophiarum* (SEH III, 543-44).

⁶⁶ See Spedding, Preface to *Partis Instaurationis Secundæ Delineatio et Argumentum et Redargutio Philosophiarum* (SEH III, 544). Graham Rees comes to a similar conclusion by different means. The *Advancement of Learning*, published in 1605, makes no reference to the *Instauration* plan, and the *Descriptio Globi Intellectualis*, which Spedding and Rees agree was likely written in 1612, refers to six *parts*. Because the *Partis Instaurationis* and the *Scala Intellectus sive Filum Labyrinthi* each refer to six *books*, Rees dates them to the period between the *Advancement* and *Descriptio Globi Intellectualis*, c. 1607-1611. See Rees, Introduction of OFB VI, xvii.

⁶⁷ Robert Ellis, Preface to *Valerius Terminus* (SEH III, 202).

⁶⁸ Robert Ellis, Preface to *Valerius Terminus* (SEH III, 202).

of the plan's six parts, it deals with only the first (the part, Spedding objects, that is missing from *Partis instaurationis*). Spedding appends to Ellis's preface a long note in which he defends his own account of Bacon's plan and its development. He allows to stand Ellis's "decided opinion" about the date it was composed but calls into question the nature of the "inventory" Bacon calls for in the tenth chapter. Ellis believes the inventory corresponds to the survey undertaken in the *Advancement*; Spedding does not. The heading of the tenth chapter, Spedding points out, asks only for an enumeration of *inventions* already discovered, and "an 'enumeration of *Inventions*' is not the same thing as a 'perambulation of *Learning*.'" We should not, to be sure, confuse parts for the wholes to which they belong. Nevertheless, just below the heading, Bacon offers a fuller description of the inventory he has in mind:

The plainest method and most directly pertinent to this intention, will be to make distribution of sciences, arts, inventions, works, and their portions, according to the use and tribute which they yield and render to the conditions of man's life, and under those several uses, being as several offices of provisions, to charge and tax what may be reasonably exacted or demanded; not guiding ourselves neither by the poverty of experiences and probations, nor according to the vanity of credulous imaginations; and then upon those charges and taxations to distinguish and present, as it were in several columns, what is extant and already found, and what is defective and further to be provided.⁶⁹

This description answers exactly to the contents of the *Advancement*. Spedding's explanation for the subsequent expansion from an inventory of inventions to a "distribution of sciences, arts, inventions, works, and their portions" rests, I believe, on a misunderstanding of Bacon's attempt to bring together more nearly man's knowledge and his power. Bacon is not limiting the range of his inventory, as Spedding proposes, but directing it, as he does knowledge generally, to new ends. I will add to Ellis's argument one further piece of evidence: Bacon, in *Temporis partus masculus* (which Spedding himself links to *Valerius Terminus*), divides the Interpretation of Nature into three books. The first, titled by Bacon the "Polishing and Direction of the Mind," corresponds to the first or

⁶⁹ *VT*, ch. 10 (*SEH* III, 234).

“prefatory” part of the Instauration plan; the second book, “The Light of Nature or Formula of Interpretation,” answers to the second or methodological part of the Instauration plan; and the third book, “Nature Illuminated, or The Truth of Things,” stands in place of the sixth and final part of the Instauration plan. For as long as Bacon conceived of a new organon to replace Aristotle’s old organon, he recognized the need for a backward-looking preface to it.

More is at stake here than a scholarly squabble about the correct dating of a text. It does not much matter, finally, if Bacon wrote the *Advancement* with a clear six-part plan in mind, or whether the ultimate shape of that plan grew out of problems the *Advancement* helped to clarify. What is at stake is the role and nature of those works in which Bacon wrestles with the philosophical tradition. Spedding’s imaginative efforts to explain Bacon’s motives in writing the *Advancement* are of a piece with his general disregard for these “prefatory” works. Along with the *Advancement*, Spedding consigns, in his complete critical edition of Bacon’s works, *Valerius Terminus*, *Temporis partus masculus*, *Redargutio philosophiarum*, *Cogitata et visa de interpretatione naturæ*, and *Descriptio globi intellectualis* (among a handful of others) to a third section of “superseded or abandoned” works. He chooses, in the section dedicated to the works “published, or designed for publication, as parts of the instauration magna,” to place the *Novum organum* and the *Parasceve ad historiam naturalem et experimentalem* before *De augmentis scientiarum*, though doing so places the second before the first part of Bacon’s six-part plan and places the review of learning between the directions for the compilations of natural and experimental histories, appended to the end of the *Novum organum*, from the natural histories Bacon drew up as specimen examples. The works are instead arranged, within their parts, chronologically. Whatever can be said for Spedding’s general reasons for dividing Bacon’s writings into three categories (philosophical and literary, professional, and occasional) in preference to a chronological ordering throughout and his argument against the decision by earlier editors to organize their

editions according to Bacon's six-part plan, once he had decided to keep separate those works he believed to be the most perfect examples of works intended by Bacon for inclusion in the Instauration plan, there is nothing to recommend a chronological ordering over Bacon's own scheme except the editor's own judgment of each piece's importance.⁷⁰

Those works Spedding relegated to the third category of superseded works "contain but little matter of which the substance may not be found in one part or another" of those works he believes Bacon "would himself have cared to preserve." They are, in his estimation, "among the most interesting of the whole collection" because "in them we may trace more than can be traced elsewhere of what may be called the *personal* history of his great philosophical scheme,—the practical enterprise in which it engaged him, and its effect on his inner and outer life."⁷¹ Spedding's interest in these abandoned works is not really different from his interest in Bacon's philosophy generally. Whereas Bacon must have valued his efforts for the promise they held of enlarging man's mastery of nature,

In our eyes, the interest which attaches to his labours is of a different kind. We no longer look for the discovery of any great treasure by following in that direction. His peculiar system of philosophy,—that is to say, the peculiar method of investigation, the 'organum,' the 'formula,' the 'clavis,' the 'ars ipsa interpretandi naturam,' the 'filum Labyrinthi,' or by whichever of its many names we choose to call that artificial process by which alone he believed that man could attain a knowledge of the laws and a command over the powers of nature,—of this philosophy we can make nothing. If we have not tried it, it is because we feel confident that it would not answer. We regard it as a curious piece of machinery, very subtle, elaborate, and ingenious, but not worth constructing, because all the work it could do may be done more easily another way. But though this, the favourite child of Bacon's genius which he would fain have made heir of all he had, died thus in the cradle, his genius itself still lives and works among us; whatever brings us into nearer communion with that is still

⁷⁰ See Spedding's "History and Plan of This Edition" (*SEH* I, iii-viii). Although Leslie Ellis accomplished much of the editorial work for Bacon's philosophical writings, he became ill and was unable to bring the work to completion. Spedding makes clear that he is responsible not only for the division of Bacon's philosophical works into three parts and the particular arrangement of the pieces within each part.

⁷¹ Spedding, Preface to Part III (*SEH* III, 171-72).

interesting, and it is as product and exponent of Bacon's own mind and character that the Baconian philosophy, properly so called, retain its chief value for modern men.⁷²

Bacon's work can hold for us "modern men" only a biographical interest. One is surprised to find an editor so openly dismissive of the works he has taken in hand. One is even more surprised to find such a confident opinion put forward by a man who believes himself an incompetent judge.⁷³

What these early works show us of Bacon's character and inner life, concludes Spedding, is a man riddled by insecurities and anxieties. Reviewing those early, unpublished fragments, Spedding sees Bacon nervously consumed in prefacing and preambing:

Instead of that overconfidence in the sympathy of his generation we find what looks like an over-apprehension of hostility. And it is in deprecating general objections; in answering, mollifying, conciliating, or contriving to pass by prejudices; in devising prefaces, apologies, modes of putting his case and selecting his audience so as to obtain a dispassionate hearing for it; that we find him, if not chiefly, yet much and anxiously employed. It is probably the experiences and discouragements of this part of his career that we owe the greater part of the first book of the *Novum Organum*, which embodies all the defensive measures into which they drove him; but though the result may be seen there, the history may be better traced in these fragments.⁷⁴

Spedding chalks up Bacon's false starts to his insecurity about his own standing and the credit his name would fail to carry with his contemporaries, an anxiety born of "the contrast between the lofty pretensions of the project and the small reputation of its author."⁷⁵ These misgivings drew Bacon away from what Spedding takes to be the heart of Bacon's project, his new logic and the carefully digested histories. Instead of getting down to the real business at hand, Bacon's labors were wasted in courting a more favorable reception. But again, Spedding's conclusion fails to account adequately for the longevity of Bacon's concerns. The *Novum organum* was published at the height of Bacon's

⁷² Spedding, Preface to Part III (*SEH* III, 171).

⁷³ "To understand and illustrate the Philosophical works in their relation to this age," Spedding writes, "a man must be not only well read in the history of science both ancient and modern, but himself a man of science, capable of handling scientific questions." Explaining the limitations he gave himself in finishing Ellis's work, he says candidly that he "could not undertake to meddle with purely scientific questions, for which I have neither the acquirements nor the faculties requisite, or to bring stores of learning, ancient or modern, to bear upon the various subjects of inquiry." See Spedding, "History and Plan of This Edition" (*SEH* I, vi-vii).

⁷⁴ Spedding, "General Preface to the Philosophical Works" (*SEH* III, 172).

⁷⁵ Spedding, "General Preface to the Philosophical Works" (*SEH* III, 174).

power. These were the deliverances of England's Lord Chancellor, not the scribblings of an obscure civil servant.⁷⁶ His "defensive measures" have given way to confident self-assertion; his rhetoric is no longer calculated to hide. But he takes no less care to court an audience and craft his message so that it should insinuate itself among the right people, and in the right way. What he was putting forward, after all, was something he believed to be wholly new and not easily understood. His prefacing and preambles reveal, I submit, less about Bacon's character and inner life than they show the vital connection between Bacon's critique of the philosophical tradition and his novel method as well as Bacon's perspicacious understanding of the real obstacles he faced in refounding philosophy. Spedding would have done better, and done more justice to his subject, had he taken Bacon's anxieties in those prefatory works more seriously.

Spedding is not alone in mistaking the first part of Bacon's *Instauration*. Richard Kennington remarked almost three decades ago that Bacon's critique of the ancients had "largely escaped thematic scrutiny," and with the exception of his own essays, the situation is little changed.⁷⁷ Bacon's new logic has always made the strongest claim on our attention, but even as his juridical or natural-historical works recaptured scholarly interest, commentators have left Bacon's deep engagement with ancient philosophy unexamined. That is, I believe, just how Bacon would have wanted it. He wanted readers who would sanction the new science and shoulder the scientific work without rooting around its philosophical foundations. Part one of the *Instauration* is meant to

⁷⁶ Graham Rees has a good discussion, in his introduction to *OFB XI*, of measures Bacon took to make his position known. He notes the "affectionate second-person singular" he used to address the king and remind his readers that he is "an aristocrat and *un homme politique* of the highest rank," an "individual favoured by a king who is both wise and beneficent." The letter of dedication is "the verbal side of a coin whose visual reverse is the authority conferred by the *mise-en-page*, or *staging* of the text of the *Instauratio magna*, i.e., by the fact that the work was produced by the King's Printers with a noble engraved title, fine typography, generous margins, and other refinements" (*OFB XI*, xlvii). See also *OFB XI*, xcix.

⁷⁷ Kennington, "Bacon's Critique of Ancient Philosophy in *New Organon I*," in *On Modern Origins*, 17. Kennington's essay was first published in 1991.

prepare us for part two, to train our sights on nature, to put our hope in the future advancement of learning, and to make it unnecessary for us ever to look back.

Spedding altogether misses what is at stake in a proposal like Bacon's to refound philosophy. The need to refigure and appropriate the past explains, better than any of Spedding's hypotheses, the very existence and nature of the Instauration's first part. Spedding's mistake is, in one way, unsurprising. He invites us to view Bacon's project as Bacon wanted most people to see it, as a new set of procedures for studying nature that would yield useful results. On this view, the new method is Bacon's chief concern and the achievement most deserving of his labor and our attention. Our interest in Bacon can only be historical or biographical if his real accomplishment is a new method and if those procedures do not obviously correspond to successful scientific practice.

Things look different if we try to adopt Bacon's own view and trust that he was capable of rightly ordering his project and giving to each of its parts the attention he believed it deserved. Acutely aware that he had undertaken work he could not hope to complete and ever conscious that his death could abruptly end it, Bacon nevertheless chose to spend what must have been considerable time and effort on works that can belong only to the first part of his Instauration. He makes at best a beginning in his description, in Book Two of *Novum organum*, of his new method. He makes scattered and fragmentary attempts at drawing up natural histories according to his exacting specifications. He produced almost nothing that could satisfy the fourth, fifth, or sixth parts of his instauration. But the fragments that belong to the first part, so varied and so curious, are better labored and the only part that he could himself bring to some near degree of completion. That he was never satisfied with those efforts, that he could not let them go, is strong evidence against Spedding's view that these works were incidental to his larger project, the "by-product of a particular accident," or the misplaced anxieties of an insecure man. If, as Spedding says, the *Advancement* was

occasioned by circumstances and hastily composed to take advantage of them, *Valerius Terminus* was not. No opportunity for the advancement of his or his project's fortune explain the care, so evident to Spedding, that he poured into its revision.⁷⁸

Bacon's care and effort show that he decided early on that his new logic would have to confront the old logic it meant to replace. The success of his project depends, in his own view, on coming to the right terms with the old philosophy. Further, I will argue that his methodological reforms take shape in those confrontations. Bacon's prefaces and preambles, if I adequately understand them and the philosophical project they initiate, contain his chief accomplishment and most lasting contribution. For it is here, in his encounter with the philosophical tradition, that we find Bacon engaged in his most fundamental and philosophical work, the refounding of philosophy.

1.5 Instauration Part One: The Preparative, or Key

Spedding was wrong about the character, scope, and purpose of the Instauration's first part. His mistakes, however, point in the right direction. He saw Bacon "devising prefaces, apologies, modes of putting his case and selecting his audience," but failed to see why Bacon thought those prefaces and apologies necessary. Together, they supply (as Ellis put it) "whatever was necessary to be known before the new method could be stated."⁷⁹ What necessarily comes before the method, as I have argued, is *methodology*, the pre-methodical thought that grounds and justifies method.

In the letter of dedication to a late work, *An Advertisement Touching a Holy War*, Bacon refers to his *Advancement of Learning* as "some preparative, or key, for the better opening of the

⁷⁸ See Spedding, Preface to *VT* (*SEH* III, 209).

⁷⁹ Robert Ellis, Preface to *Valerius Terminus* (*SEH* III, 202).

Instauration.”⁸⁰ His *Instauratio magna* had been well received abroad, but Bacon worries “that it flies too high over men’s heads.” The matter is just too new. The *Instauratio* “gives the new unmixed” except for “some little aspersion of the old for taste’s sake.”⁸¹ Bacon’s more detailed description of the Instauration’s first part in *Distributio opera* agrees with the description in *An Advertisement*. There he tells us that his review of learning has two aims: to “more readily perfect the old” and “more easily gain access to the new.” Bacon is not interested in the old philosophy for its own sake, but only insofar as it can be used to institute and further his own, new philosophy. That is the job of the Instauration’s first part, to transform the tradition, secure a new starting point for philosophy, and make us ready to hear what Bacon has to say.

Here I want to say something about the texts that, in my view, belong to the first part of Bacon’s Instauration and the problems all those prefaces and apologies attempt to solve.

1.5.1 Part One Texts

Bacon introduces his new modes and orders over a surprisingly wide range of texts. Spedding had noticed Bacon’s own hint, in *Advertisement Touching a Holy War*, about the need to prepare the way from the old to the new science, but can make nothing of it. He has too limited a view of the role the first part has to play. The “proper business” of the Instauration’s first part, he supposed, is the partitioning of the sciences. According to Spedding, only two or three texts focus on that partitioning, and they alone, and then only those parts that concern the division of the sciences, comprise all Bacon left us of the Instauration’s first part. Because I take a broader view of

⁸⁰ *AHW* Epistle Dedicatory (*SEH* VII, 13).

⁸¹ *AHW* Epistle Dedicatory (*SEH* VII, 13).

its scope and purpose, I include among the Instauration's first part several texts that Spedding and others do not.

In 1620, when he published *Novum organum*, he reports the Instauration's first part as "absent," though it could "to some extent be retrieved from Book Two of the *Advancement of Learning Divine and Human*."⁸² Two or three years later, in a letter dedicating *An Advertisement Touching a Holy War* to his friend, Lancelot Andrews, Bacon says that *De augmentis scientiarum*, the much-enlarged Latin translation of his *Advancement*, "may serve in lieu of the first part of the *Instauration*, and acquit my promise in that part."⁸³ These two published works, singled out by Bacon, come closest to his public design for the Instauration's first part, though neither, it seems, perfectly satisfies it. He began a third, unpublished partition of the sciences, *Descriptio globi intellectualis*, sometime around 1612. These three together represent one approach Bacon pursued to clear a path for his new science.

No one doubts that Bacon assigns these inventories of learning to the Instauration's first part. But there are several other works, different in tone and tack, that function as preparatives or keys to Bacon's new logic and so properly belong to the Instauration's first part. He tries a different strategy in two early, unpublished fragments: *Temporis partus masculus* (c. 1603) and *Redargutio philosophiarum* (by 1609). Where the three inventories were content to reorganize the old learning and note its omissions, *Temporis partus masculus* and *Redargutio philosophiarum* spiritedly (and often personally) attack the ancient philosophers, their medieval followers, and modern alchemists, physicians, and empirics. *De sapientia veterum* (published 1609) and *De principiis atque originibus* (c. 1612) are examples of a third way Bacon tried to insinuate this new science through an admixture of the old. In both, he pretends to find in Greek myths some of the most important teachings of his new

⁸² NO (OFB XI, 49).

⁸³ AHW Epistle Dedicatory (SEH VII, 14).

science. Like a ventriloquist, he makes the ancients speak his words. Among these preparatory works, I might also include Bacon's own fable, *New Atlantis*. It tells the story of a successful refounding with tantalizing hints about the political, religious, and scientific institutions necessary for its accomplishment.

But his most important mediation between the new and the old is the first book of *Novum organum* (published 1620) and the material with which he prefaced it. *Valerius Terminus* (c. 1603) and *Cogitata et visa de interpretatione naturæ* (c. 1607) anticipate the strategy that Bacon had, by 1620, greatly polished and refined. In a private letter to King James, Bacon links his *Novum organum* to the *Advancement*. *Novum organum* is “the same argument sunk deeper,”⁸⁴ Bacon's most complete answer to the problems of refounding philosophy. The defense of learning in *Advancement* Book I becomes a confident statement of philosophy's new goal, a new mode of contemplation that more perfectly joins the speculative and practical goals he had long sought to reconcile. The refutations of the old philosophies find their ground in a more general and more radical critique of human reason. It is not Plato and Aristotle that have kept us from knowing and mastering the world, but the very nature of the human mind. No where does Bacon devote so much energy to inspiring hope, the necessary counterbalance to the despair brought on by his critiques.⁸⁵ He also reimagines the relationship between the new and the old sciences. Bacon had tried, in his earlier fragments, to deny philosophy's patrimony and make a fresh start. He tried, in his interpretations of old fables, to get around or behind Socratic philosophy. He tried, in his published inventories, to treat the past as an inheritance—meager, perhaps—but one that careful management and good husbandry could multiply. But in *Novum organum*, Bacon admits the ancient philosophers as a second tribe or clan of philosophy, circumscribing but also, within those proper limits, legitimizing the old learning. The old

⁸⁴ *LL* VII, 120.

⁸⁵ See especially *NO* I §92 (*OFB* XI, 77-79).

philosophy need not be refuted or reformed, but incorporated or subsumed. The turn to method, made necessary by his general critique of reason, makes room for the old philosophy's political or human wisdom alongside the new science's knowledge of nature.

These, then, are the principal works I count as contributions to the Instauration's first part. Across those texts, we can see four or five basic ways in which Bacon relates his new science to the philosophical and biblical traditions. The works Bacon publicly designates as the Instauration's first part suggest a basic continuity between the old and the new science. The new science builds on the old, adding to the store of knowledge and making, where necessary, adjustment and improvements. Other, unpublished texts emphasize Bacon's totally new beginning and so, too, his radical break with the old philosophy. A third set of texts pretends to discover fundamental truths about nature and man in ancient fables. Bacon's "new science" is really only the recovery or re-discovery of a long-forgotten wisdom. Finally, a fourth set of texts affirms the heterogeneity of the old and new science and proposes to divvy up reality between them. Only Bacon's new science can hope to grasp nature's subtlety. The old philosophy, though it must give up its pretensions to know nature, can still be of some use—for now, at least—in human affairs and in civil matters, where assent matters more than truth. Perhaps the divided reign will continue forever, though Bacon also hints that, once it is sufficiently advanced, the new science may be able to rule alone.

It could seem, based on what I just said, that Bacon's thinking about the relation between his new and the old science evolved over time. Bacon, at first so hostile to the old science, softens and eventually accommodates it. But we know what a typical reader in the early seventeenth century could not, that Bacon pursued several of these strategies at the same time or by turns. The refutations he chose to exclude from the *Advancement* found their way, at about the same time, into the unpublished *Temporis partus masculus* and, a few years later, into the also-unpublished *Redargutio*

philosophiarum. He develops the *Advancement* into *De augmentis scientiarum* at the same time or just after publishing *Novum organum*. He published *De sapientia veterum* the year after he declined, in *Redargutio philosophiarum*, to win credit for his new discoveries by feigning for them an ancient lineage. He incorporates his interpretations of the myths of Pan, Perseus, and Dionysus into *De augmentis scientiarum*. *Cogitata et visa* anticipates by some 13 years his accommodation, in *Novum organum*, of the old philosophy. These different moments of the Instauration's first part are deeply intertwined. The accommodations, though they are concentrated in later works, in no way supersede the earlier repudiations. Each part—the vitriolic attacks, the subversive inventories, the reoccupations of old fables, as well as the incorporation of the old philosophy—serve a purpose or direct itself to a different audience. We cannot account for them by speculating about Bacon's "development" or appealing to biography. Instead, we should search for some way to reconcile what look at first like different or even contradictory stances to the past. Only then will we have caught sight of Bacon's fundamental thought.

1.5.2 Problems

Bacon's preparative or key, the first part of his Instauration, aims to solve two problems. Both arise from his attempt to break away from the old philosophy and begin anew.

Bacon has good reasons for refusing to stake out an unambiguous relationship between his new method and the old philosophy. To name only the most obvious reason, Bacon needs to appeal to opposed interests. Bacon's innovations threaten to upset the opinions by which we guide our affairs. If his reforms were merely private (as Descartes says his are), he would not need to prepare us or bring us around to his way of thinking. Since he means to bring about a radically new order, he

must find the right way to talk about his innovations. He must find ways to describe his relation to the past that mollify those who want to see things stay the same and, at the same time, inspire those he needs to help him bring about a revolution. This is the *political* or *rhetorical* problem Bacon's preparative or key must solve.

A second, *dialogical* problem also pushes Bacon to stake out different relationships between the tradition and his innovations. Bacon needs to justify his rejection of the old philosophy, but he denies the possibility of rational refutation. No debate is possible when the disputants disagree about first principles and the rules of demonstration. Instead, he grounds his critique of the old philosophy in a more general critique of human reason that threatens to undermine the very possibility of philosophy, his own included. Thus in justifying his new beginning, Bacon seems to make a new beginning impossible. We already saw this problem in another guise, as a question about the mysterious origins of Bacon's new method. What we discovered about the origins of Bacon's new method apply here, too. To solve the dialogical problem, we will have to consider Bacon's *methodological* critique—what I will argue is at bottom a *prudential* critique—of the old philosophy. The old philosophy seems at first to stand between us and an unmediated experience of nature. In fact, Bacon's newly mediated, *methodical* access to nature depends on those earlier attempts to understand nature. And as we will see, Bacon's most basic assumptions about nature and man develop dialectically out of the old views of nature and man he rejects. But a progressive philosophy—a philosophy of the future—cannot be *dialectical*. So to make a new and non-dialectical beginning, Bacon must cover over the dialectical origins of his dogmatic method.

In short, Bacon wants a new beginning, but he finds himself *in media res*, the loath heir to a long philosophical tradition. The rhetorical or political problem comes to this, that we live by old and authoritative opinions. Bacon has to find a way to quietly replace or reform those old beliefs.

The dialogical problem comes to this, that Bacon's new science rivals the old science without being able to vanquish it, that his new science fundamentally depends on the old science it aims to supplant.

1.6 The Rhetorical Problem and Bacon's Rhetorical Strategies

Our quick survey of the texts that belong to the first part of the Instauration gesture toward Bacon's solution to the rhetorical problem. Before I can describe his solution in greater detail, I should first say a bit more about the problem itself.

The rhetorical and political problem must be met by anyone who wishes to introduce new modes and orders. "Nothing is more difficult to handle," Machiavelli counsels, "more doubtful of success, nor more dangerous to manage, than to put oneself at the head of introducing new orders."⁸⁶ A prince who inherits his kingdom, by contrast, need "only not depart from the order of his ancestors, and then to temporize in the face of accidents."⁸⁷ His people have forgotten the innovations that brought the first of the line into power. Settled customs guide their thoughts and actions and legitimate the present order. Like a new prince with a new state, a philosophical founder "has all those who benefit from the old orders as enemies"—those men who have profited from seeming wise, and those whose opinions and way of life find support in the old philosophy—"and he has lukewarm defenders in those who might benefit from the new order," lukewarm because men find it hard to "truly believe in new things unless they have come to have a firm experience of them." Unlike a prince, however, a philosophical founder cannot conquer a new province or hold it

⁸⁶ Niccolò Machiavelli, *The Prince*, trans. Harvey C. Mansfield (Chicago: University of Chicago Press, 1998), 23-24.

⁸⁷ Machiavelli, *The Prince* II, 6.

by force. And because the new science undoes the old science without immediately benefiting men, Bacon's instauration must, at first, be a solitary undertaking. But if it is to succeed, he must rally his defenders and win his enemies to his side.

Descartes expressed well the political consequences of generalizing his own attempt to uproot old opinions and refound knowledge. The laws and customs that govern a political community are like the streets and buildings in an old city. Both grow and take shape "by fortune rather than the will of men using reason." Although a city plan drawn up by a single architect would be more perfect, more useful, and more beautiful, still "we do not see one tearing down all the houses of a city for the sole purpose of remaking them in a different manner and of making the streets more beautiful."⁸⁸ And for good reason:

Those great bodies are too difficult to raise again once torn down, or even to hold up once they have been shaken, and their fall can only be very violent. Besides, as for the imperfections they might have (which the mere diversity among them suffices to show that many do have), usage has doubtless greatly mitigated them, and has even insensibly avoided or corrected many of them, which could not have been well foreseen by prudence. Finally, they are almost always more tolerable than their alteration would be, in the same way that great roads that wind among the mountains little by little become so smooth and so comfortable from frequent use that it is much better to follow them than to try to take a straighter course by climbing over rocks and descending to the bottom of precipices.⁸⁹

Boldness and integrity in one's personal beliefs and conduct may be, for a man capable of them, a laudable goal, but for governments and public institutions, the wiser course is the more conservative. Over time, the imperfections become livable and sometimes even take on a certain charm. Small corrections taken as circumstance recommends prove better adapted to communal life than anything drawn up by the most prudential foresight.

Were one to try a wholesale reform, there is still the question of where people will live after the town has been razed but before the new and more commodious buildings are put up. "It is not

⁸⁸ Descartes, *Discourse on Method* II, 22.

⁸⁹ Descartes, *Discourse on Method* II, 23.

enough,” Descartes counsels, “before starting to rebuild the house in which one lives, to tear it down and to provide materials and architects, or to practice architecture oneself, and in addition to have carefully drawn up the plan, but one must also be provided with another, where one can be comfortably housed while working on it.”⁹⁰ The “provisional morality” that will guide Descartes’s actions while he reforms his judgments cannot take the place of the fixed laws and established customs which make civil society possible. And in fact Descartes’s provisional morality depends on “the laws and customs of my country” and “the religion in which God gave me the grace to be instructed from childhood.”⁹¹ These considerations persuade Descartes that “it is truly implausible for an individual to intend to reform a state by changing everything from the foundations and overturning it in order to rectify it; or even to reform the body of the sciences, or the order established in the schools to teach them.”⁹² Even the most radically new beginning will be constrained by the already-existing order.

Like Machiavelli and Descartes, Bacon, too, faces the difficult task of unseating old and authoritative opinions and instituting new modes and orders. Now that we understand the problem better, we can turn our attention to Bacon’s solution. To begin, I want to focus on some of the rhetorical strategies Bacon uses to speak differently to different audience, to disguise his innovations, and to open up (for the right sort of reader) his novel teachings.

⁹⁰ Descartes, *Discourse on Method* III, 27.

⁹¹ Descartes, *Discourse on Method* III, 27-28.

⁹² Descartes, *Discourse on Method* II, 22.

1.6.1 Bacon's Middle Course

Bacon's difficult rhetorical task requires making different sorts of appeals. For most, the new must not appear threatening or offensive; its novelty cannot seem quite so novel. Old prejudices cannot be violently unseated. Challenging them too openly invites opposition. Radical changes are more likely to succeed if new habits of thought and action surreptitiously take root, if they are insinuated gradually and made almost insensible. By using old words and old conceits with new meanings, Bacon can disguise the new with a "taste" of the old and allow innovation to feel familiar. When innovation cannot be disguised, it must be made to look necessary or, better, beneficial.

But for a few, the "sons of science," the instauration holds a different allure. Bacon's bombastic calls to begin again the work of the mind from the very foundation are calculated to embolden men who would otherwise be content with half-measures, to entice the scientific laborers who would gather the needed natural histories and compile the tables of discovery. Bacon's invitation to "leave behind nature's entrance halls (trodden by countless feet), and at last throw open the doors to her inner sanctum," would, if it reached the right ears, be irresistible.⁹³ For these men, a return to the ancients must become unthinkable.

"[S]ome intellects are captivated by admiration of antiquity," Bacon observes, and "some by love and infatuation for novelty." Only a "few are judicious enough to steer a middle course, neither ruining what the ancients rightly laid down nor despising what the new men rightly put forward."⁹⁴ Bacon, of course, counts himself among those judicious few. Yet the incongruity of his audience can make Bacon seem incongruent with himself. He must be both measured and bold, both conciliatory and provocative. He must at times appear more traditional than he is in order to win a hearing and avoid controversies and unproductive debate. At other times, he must tempt men with the promise

⁹³ NO Preface (OFB XI, 59).

⁹⁴ NO I §56 (OFB XI, 91). Cf. AL I (OFB IV, 28).

of something radically new. To win converts to the method and inspire the confidence of those who will know it only through its fruit, he makes a strategic decision to navigate a middle course, distancing himself from the ancients, but inconsistently and ambiguously.

Instauratio, the name Bacon gives to his architectonic project, strikes this delicate balance between the new and the old and shows us something of Bacon's strategy. It is an ambiguous term, signifying both restoration and institution, a totally new beginning as well as the purification or perfection of the old.⁹⁵ How one takes it depends on one's commitments. The lover of tradition will hear it as a call to restore a time-weathered edifice to its original beauty. The lover of novelty, weary of the old ways, will hear it as an announcement of a new construction from the very foundations. The past is portrayed, depending on who is listening, as a corrupt inheritance we should deny or a rich tradition of accumulated experience and hard-won knowledge to be preserved or built upon. That doubleness allows Bacon's program to look continuous from one angle and discontinuous from another. It makes possible a pivot from the old to the new.

1.6.2 *Selecting an Audience: Seeking the "Sons" of Science*

We can get a more fine-grained understanding of Bacon's rhetorical strategy for recruiting the "sons of science" by comparing *Temporis partus masculus* and *Redargutio philosophiarum*.

In form, *Temporis* is a monologue. Both the speaker and his audience are ambiguous. An old man speaks—privately, it seems—to a young man or young men, addressing them familiarly as "my son." He has a problem: how can an experienced man of science best hand on his knowledge to his

⁹⁵ See Charles Whitney, *Francis Bacon and Modernity* (New Haven: Yale University Press, 1986), 23-54.

pupil? In fact, he has no interest in “maintain[ing] the tradition of the sciences.”⁹⁶ The old teaching is false, and so are the old ways of teaching. “In fact the incompetence of their teaching must be ascribed to the worthlessness of their knowledge.”⁹⁷ He has “after prolonged examination both of the state of nature and the state of the human mind” discovered a new method.⁹⁸ His problem is not how to hand on old knowledge, but how to initiate men into a new tradition and direct them to a new goal.

Redargutio philosophiarum, written some five years later, begins with the same or a similar problem. Its narrator, also unnamed, is planning “an Instauration of Philosophy . . . designed to improve the conditions of human life.”⁹⁹ He, too, is stuck: “I am preparing a refutation of philosophies,” he says, “but know not how to begin.”¹⁰⁰ As luck would have it, the narrator is visited by an unnamed friend recently returned from France. At a gathering in Paris, this friend heard a man speak, a man “of peaceful and serene air, save that his face had become habituated to the expression of pity.”¹⁰¹ Like the narrator, the speaker is engaged in an instauration of philosophy. The friend relates his speech, and that relation, though “very inferior to the original,” is allowed to stand in for the argument from signs that the narrator had planned.

Both *Temporis* and *Redargutio* dramatize the rhetorical and dialogical problems Bacon himself tried to solve with his Instauration’s first part: how can men be initiated into the new science? The men whose business it is to hand on the torch of science fall short in “publishing or concealing” their knowledge and lack “any art or precepts to guide them in putting their knowledge before the public.” Since “all the approaches and entrances to men’s minds are beset and blocked by the most

⁹⁶ *TPM* (F, 61).

⁹⁷ *TPM* (F, 62).

⁹⁸ *TPM* (F, 62).

⁹⁹ *RPb* (F, 104).

¹⁰⁰ *RPb* (F, 103).

¹⁰¹ *RPb* (F, 104).

obscure idols,” since no “clean and polished surface remains in the mirror of the mind on which the genuine natural light of things can fall,” Bacon and his unnamed speakers cannot “put the matter plainly” and allow their audiences to use their own judgment.¹⁰² They cannot appeal to sense evidence before first “opening up and levelling a special path on account of the inveterate prejudices and obsessions of our mind.”¹⁰³ Old philosophies also block the path to the new science, but they cannot be easily refuted because what is in question are the very principles and forms of demonstration that make rational debate possible.

To overcome these difficulties and gain “quiet entry into minds so chocked and overgrown,” Bacon and his speakers must find “a new method.”¹⁰⁴ Since men cannot be converted to the new teaching through rational argument, they must be “beguiled by art.” The appeal must be “mild and afford no occasion for error,” says the speaker in *Temporis*, for “frenzied men are exacerbated by violent opposition.” The new teaching must insinuate itself by some “inherent power” and “vital principle”—not self-evidence, but a power or principle that is neither perfectly rational nor evidentiary. And most importantly, the new teaching “must be such as to select her followers, who must be worthy to be adopted into her family.”¹⁰⁵

We can get some idea of the type of “sons” the *Temporis* speaker seeks by paying attention to his rhetoric. Instead of the “mild” and “quiet” method, free of “violent opposition” he had called for, we get savage personal condemnations of some of philosophy’s great men. Aristotle is “that worst of sophists,” a “cheap dupe of words”; Plato a “mocking wit,” a “swelling poet,” and a “deluded theologian.” Perhaps the more gentle mode of teaching is necessary when putting one’s

¹⁰² *TPM* (F, 62).

¹⁰³ *RPb* (F, 103).

¹⁰⁴ *TPM* (F, 62).

¹⁰⁵ *TPM* (F, 62).

“knowledge before the public.” This monologue, however, is private, and its audience requires a different mode of instruction.

The mind’s Idols are not all that stand between these sons and the true science. “We must,” the speaker asserts, “find a way of clearing sham philosophers out of your path.”¹⁰⁶ Such a refutation could profit only men already well acquainted with the philosophical tradition. The tone and scope of the attacks suggest that these “sons” are, despite their learning, without strong philosophical loyalties. The attacks are almost indiscriminate. Aristotle, Ramus, Plato, Galen, Paracelsus, and Hippocrates are all called to the bar, but the narrator does not neglect to name minor figures in his indictment. His attack on Galen extends to his “Arabian confederates” and the “perfunctory mob of modern physicians” too trifling to name. The whole dishonest confederacy of alchemists are accomplices to Paracelsus’s crimes. The few he spares—Roger Bacon, Peter Severinus—only lend credibility to his sweeping denunciations.

Belonging to none of these schools or sects, the “sons” do not need to be argued out of their false opinions. The show of force seems calculated instead to shock. “Can everything taught by all these men be vain and false?” he asks on their behalf. “Do you think you can supply the place of all those you reject?”¹⁰⁷ We can imagine these men, stunned by the speaker’s boldness and the enormity of his proposals, but also thrilled at the heady prospect of a more knowing and more powerful science. To supply what he has rejected, the speaker will bring these men, in time, to things themselves and a closer acquaintance with nature. But because these “sons” have, like the Romans after the fall of the republic, “become too accustomed to following a guide,” they cannot be left to their own judgment. His bravado, his scathing critiques and his immodest proposals, prepare the monologue’s last sentence: “Take heart, then, my son, and give yourself to me so that I may restore

¹⁰⁶ *TPM* (F, 63).

¹⁰⁷ *TPM* (F, 70-72).

you to yourself.”¹⁰⁸ Having won their confidence, the narrator robes himself in the authority he stripped from the ancients.

While the speaker in *Redargutio* also addresses his audience familiarly as “my sons,” we should not confuse this audience with the audience in *Temporis*. This audience is some fifty men, “all of mature years” and “all bearing the stamp of dignity and probity.” They are eminent men and men of affairs, “officers of state, senators, distinguished churchmen, people from all ranks of life, and foreigners from various nations.” They are the kind of men—patient and fair, “of lofty and resolute minds,” moved by “generous” and “noble” motives—that the narrator hopes to persuade.¹⁰⁹ We can take a fuller measure of these men from the opening of the speaker’s address:

We are agreed, my sons, that you are men. That means, I think, that you are not animals on their hind legs, but mortal gods. God, the creator of the universe and of you, gave you souls capable of understanding the world but not to be satisfied with it alone. He reserved for himself your faith, but gave the world over to your senses. Neither of these oracles did he wish to be clear, but wrapped in obscurity. Yet have you no ground for complaint that he makes you exert yourselves. Your reward is to know the excellence of things.¹¹⁰

They are, in short, Christians and Aristotelians; rational animals made in the image of their Creator. Such “congenial minds” do not yield to the kind of “satire” or “boastful confidence” that marked *Temporis*.¹¹¹

In place of the catalog of philosophical sins, *Redargutio* slowly unfolds a sustained and subtly modulated argument meant to convert these theorizers to a more active or practical philosophy. The undifferentiated mass of error takes a more definite shape. There are, the speaker says, three classes of philosophy: the Sophists, the Socratics (principally Plato and Aristotle), and the Presocratics. But there is no essential difference between the Sophists and the Socratics. Plato, Aristotle, and the rest

¹⁰⁸ *TPM* (F, 72).

¹⁰⁹ *RPb* (F, 104).

¹¹⁰ *RPb* (F, 106).

¹¹¹ *RPb* (F, 103).

of their kind “were Sophists of a reformed and better type.”¹¹² They stayed in one city and taught without the “indignity of taking fees,” but they founded schools and sects.¹¹³ By linking the Socratics to the Sophists, the speaker means to gently shame the Christian Aristotelians in the audience and break the spell that has kept them in “self-imposed servitude” to Aristotle.¹¹⁴

The Sophists and Socratics were both inferior to those more ancient thinkers their schools and sects eclipsed. In Aristotle, he says, “you hear the voice of dialectics more often than the voice of nature.” He “constructs a world from categories.”¹¹⁵ Plato abandoned natural philosophy and “infected and corrupted natural studies by his theology as much as Aristotle did by his dialectic.”¹¹⁶ Empedocles, Heraclitus, Anaxagoras, Parmenides, and especially Democritus “were more devout devotees of experience.”¹¹⁷ Instead of opening schools, collecting fees, and attracting pupils, the Presocratics “without noisy advertisement or professorial pomp . . . seriously devoted themselves to the search for truth and the study for nature.”¹¹⁸ By comparison, the Sophists, Plato, and Aristotle were unserious men. Their different methods are bound up with this moral difference. The Sophists and Socratics were preoccupied with words and opinions in part because they needed or wanted pupils. Because they neither joined nor founded a school or sect, the Presocratics were more free to engage things themselves and experience. The lesson is clear: we should emulate those more severe searchers after truth, their independence if not also their method.

The speaker’s instauration is not, however, a simple return to Presocratic philosophy. The Presocratics, like the men in the audience, pursue a contemplative philosophy. The speaker never directly calls that contemplative goal into question. Instead, he gently insinuates a new goal. The

¹¹² *RPb* (F, 111).

¹¹³ *RPb* (F, 111-12).

¹¹⁴ *RPb* (F, 114).

¹¹⁵ *RPb* (F, 112).

¹¹⁶ *RPb* (F, 115).

¹¹⁷ *RPb* (F, 116). Democritus is singled out here, though the fuller list of Presocratics comes earlier (F, 111).

¹¹⁸ *RPb* (F, 111).

“signs” so far have pointed to the ancients’ contemplative failure. The initial appeal of his new method is its greater contemplative success. Contemplative success, however, requires “opening up a middle way between practical experience and unsupported theorising” that constrains the mind to a stricter and more disciplined “research into truth and nature.”¹¹⁹ Practice gains entry as an aid to contemplation.

Only now does the speaker artfully turn to the alchemists. “The fact is,” he says, “that your philosophy, by being strong in arguments and weak in works, has produced in some quarters a high regard for alchemy.”¹²⁰ He does not mean to hold up the alchemists as a model for his audience to emulate. They serve instead as a goad and a pointer toward a new standard. The alchemists’ “speculative philosophy is slight and deceptive,” but “they have endowed human life and fortunes with many discoveries not to be despised.”¹²¹ Speculative truth is not the only appropriate measure of a philosophy.

The discussion of the alchemists is a useful “digression,” made “to prepare your minds” and weaken the inveterate prejudice against things new.¹²² Resuming his interrupted list of the “signs” by which the old philosophy can be judged, the speaker says, now that his audience is ready to hear it, that “There is no ‘sign’ more certain and noble than that from fruits.”¹²³ Faith is shown by works. Philosophy should submit to the same test, and “if it be barren let it be set at naught.”¹²⁴ The demand that philosophy produce is not only a theoretical requirement for something like experimental proof. The “works and power of action which are the worthy and legitimate fruit of mental endeavor” need not only command nature, but direct it toward the human good. Plato and

¹¹⁹ *RPb* (F, 120 and 118).

¹²⁰ *RPb* (F, 121-22).

¹²¹ *RPb* (F, 122).

¹²² *RPb* (F, 123).

¹²³ *RPb* (F, 123).

¹²⁴ *RPb* (F, 124).

Aristotle are, by this measure, abject failures. The old philosophy “has not yielded one achievement tending to enrich and relieve man’s estate.”¹²⁵ The same error led to their practical and theoretical failures. Had their thought “remained firm-rooted in the lap and womb of nature” their philosophies would be both more true and more useful.¹²⁶

Having sufficiently prepared his listeners, the speaker now exhorts them, not just to a new philosophy, but to a new and greater vocation:

Let us, then, bid goodbye to these abstract philosophies, and let us, you and I, my sons, take our stand by reality. Let us not set our minds on the idle glory of founding a sect but in a spirit of responsibility concern ourselves with the task of promoting utility and greatness. Let us establish a chaste and lawful marriage between Mind and Nature, with the divine mercy as bride-woman. And let us pray God, the Father of men and nature as well as of lights and consolations, by Whose power and will these things are done, that from that marriage may issue, not monsters of the imagination, but a race of heroes to subdue and extinguish such monsters, that is to say, wholesome and useful inventions to war against our human necessities and, so far as may be, to bring relief therefrom. Let this be our prayer at the consummation of this rite.¹²⁷

That prayer will not go unanswered. Already we have surpassed the ancients. They declared the thunderbolt inimitable; “In defiance of them we have proclaimed it imitable, and not that wildly but like sober men, on the evidence of our new engines.”¹²⁸ We have circumnavigated the globe and invented the printing press, making through lights both in the terrestrial and the intellectual globes. This is no more than the prophet Daniel foretold. All we must do is emancipate ourselves and “dare to despise shams.” Our future felicity rests on “a true and proper”—but also a strange—“humbling of the human spirit” that will make us masters of ourselves and of nature.¹²⁹

¹²⁵ *RPb* (F, 125).

¹²⁶ *RPb* (F, 126).

¹²⁷ *RPb* (F, 130-31).

¹²⁸ *RPb* (F, 131).

¹²⁹ *RPb* (F, 133).

Compare this lofty exhortation to the narrator's more forcible statements in *Temporis*: "I am come in very truth," he says, "leading you to Nature with all her children to bind her to your service and make her your slave." In place of a humble prayer, we get these vast promises:

My dear, dear boy, what I purpose is to unite you with things themselves in a chaste, holy, and legal wedlock; and from this association you will secure an increase beyond all the hopes and prayers of ordinary marriages, to wit, a blessed race of Heroes or Supermen who will overcome the immeasurable helplessness and poverty of the human race, which cause it more destruction than all giants, monsters, or tyrants, and will make you peaceful, happy, prosperous, and secure.

The two speeches contain many of the same elements, but the effect is markedly different. The statement in *Redargutio* is mild and generous. Couched in a prayer, it cedes space for a more contemplative aspect even as it urges men to a greater practical responsibility. In *Temporis*, the good is wholly practical and primarily private. *You* will be happy and prosperous, a hero or superman, lord over enslaved nature. The prayers and biblical allusions are absent. It makes no appeal to humility or a "spirit of responsibility." Charity is a byproduct.

Tempting as it is to dismiss the acerbic *Temporis partus masculus* as "mistaken tactics" and youthful indiscretion, the facts will just not support it.¹³⁰ When he wrote it, Bacon was a middle-aged man, not a young hot-head. He penned, about the same time, the more measured *Valerius Terminus* and, some two years later, the *Advancement of Learning*. Their differences cannot be explained away by appealing to biography. Spedding comes closer to the mark when he explains *Temporis* as an "experiment" in "the art of commanding audiences and winning disciples."¹³¹ But he, too, sees it as a failure, or at least believes Bacon regarded it as a failure. He infers Bacon's judgment from his decision to "recast the argument in another form, leaving out all that was scornful and offensive towards others, and retaining only that tone of lofty confidence in the worth of his own speculations

¹³⁰ Farrington explains *TPM* as "mistaken tactics." See Farrington, *The Philosophy of Francis Bacon*, 35-37.

¹³¹ Spedding, Preface to *Temporis Partus Masculus* (*SEH* III, 525).

which grew naturally out of his profound conviction of their truth.”¹³² Spedding and Farrington both want to explain the rhetorical differences between Bacon’s texts as a development or change in their author. It does not occur to either that the true explanation might be Bacon’s need to speak differently to different men.

1.6.3 *Selecting an Audience: Speaking to Philosophical Founders*

Bacon chose not to publish *Temporis partus masculus* and *Redargutio philosophiarum*. Farrington again takes that choice as a sign of Bacon’s own judgment of their worth. Had they been better executed and more complete, he would have pushed them into print. But Bacon intended to keep *Temporis*, if not both, private. The last item listed in the contents of *Valerius Terminus* is “the first chapter of [the] a book of the same argument written in Latin and destined [for] to be [traditionary] separate and not public.” That book, Spedding informs us, is *Temporis partus masculus*, which immediately follows *Valerius Terminus* in the manuscript volume.¹³³ The item interests Spedding only insofar as it helps him date the works. The announcement, in a work intended for publication, of another work “of the same argument” but meant to be kept private, does not figure in his interpretation of either. He does not ask why the same argument might need to take multiple forms or why some of those forms would best be kept private. Spedding’s astonishing indifference should not stop us from asking about so strange a fact.

Bacon himself offers a clue in the *Advancement of Learning*. In a discussion of the problem of handing on knowledge, he distinguishes, under the rubric of “the Methods of Tradition,” several

¹³² Spedding, Preface to *Temporis Partus Masculus* (SEH III, 526).

¹³³ VT (SEH III, 216, fn. 1). See also Spedding, Preface to *Temporis Partus Masculus* (SEH III, 523). Cf. Spedding’s note to Ellis’s introduction to NO (SEH I, 107-13).

methods divided into pairs.¹³⁴ The first and most important pair opposes the *magisterial* method to the *probative* or *initiative* method. The former presents conclusions in the most believable and persuasive form; the latter initiates the recipient into the thought which led to those conclusions, “if it were possible, in the same method wherein it was invented.”¹³⁵ The first shares only the fruit of thought, but the second sinks living roots in order to “transplant the author’s thinking into another mind.” Bacon also distinguishes another pair of methods, closely related to the first and “used in some cases by the discretion of the ancients”: the *disclosed* or *exoteric* and the *enigmatical* or *acroamatic*.¹³⁶ An acroamatic text seems, on the surface and to most, to say one thing while at the same time saying something else to those “of such sharpness as can pierce the veil” or those who have been “admitted to the secrets of knowledge” through some other, more private teaching.

Spoken privately to a sympathetic audience, the addresses in *Temporis partus masculus* and *Redargutio philosophiarum* need not be enigmatical or acroamatic. In each, the speaker perfectly fits his speech to its audience. Where the speaker of *Temporis* counseled his audience to trust themselves to his guidance, the speaker in *Redargutio* encourages his listeners—presumably older, more prudent, and more eminent men, but also men devoted to Aristotle—not to “follow anybody indiscriminately in everything, like blind men following a guide.” He plucks them up, assuring them that “You may be inferior to Aristotle on the whole, but not in everything.”¹³⁷ “You will never be sorry for trusting your own strength,” he promises them, “if you but once make trial of it.” Those younger men in the audience in *Temporis* were never so beholden to Aristotle. They have fewer intellectual loyalties to betray, and they did not have as much to lose by disowning opinions so commonly held and “sanctioned by the institutions of academies, colleges, orders, and even states themselves.” They

¹³⁴ *AL* II (*OFB* IV, 122-26).

¹³⁵ *AL* II (*OFB* IV, 123).

¹³⁶ *AL* II (*OFB* IV, 124).

¹³⁷ *RPb* (F, 114-15)

have not risen high enough to worry about falling. Not so the older men. “Keep your old philosophy,” the speaker counsels them. “Use it when convenient” and “profess it in public and increase your gravity thereby in the eyes of the masses.” He flatters them: “Every man of superior understanding in contact with inferiors wears a mask.”¹³⁸ The younger men’s unfixed beliefs necessitate a wider attack. It must undercut Paracelsus no less fervently than Aristotle. In *Redargutio*, by contrast, the alchemists fare well. The Aristotelians it speaks to are in no danger of becoming alchemists or natural magicians. Instead of ridiculing the alchemists’ modest discoveries, it uses them to shame theoretically-inclined men into becoming more practical. The old men had to be gradually and carefully brought round to the new science’s goal. The young men, with greater daring and less to lose, need no easing.

But neither address follows the *initiative* method. An unpierced veil still separates each speaker from his audience. The speaker in *Temporis* knows that the old philosophers “share a common guilt and might well have been confounded in a common accusation.”¹³⁹ He chooses not to reveal it. His audience can profit from his conclusions, but they are unfit or not ready to be initiated into his reasons. Despite his familiar form of address, the speaker in *Redargutio* distances himself from his audience. The philosophy he refutes is “your philosophy,” not his. He possesses a truth about nature and the human mind that cannot be imparted, not to these men, or at least not yet. These speakers are as distant from their audience as their audience is from the common run of men.

The speeches in *Temporis* and *Redargutio* are magisterial, but each text also contains an *acroamatic* and *initiative* teaching. Both fragments show us three kinds of men: the founders or inventors of the new science, the “sons of science” who practice the new science without being

¹³⁸ *RPb* (F, 108).

¹³⁹ *TPM* (F, 70).

initiated into its founding reasons, and the vulgar many who will know the new science only through its fruits. If we are like most men, we will pass by these prefatory works. The fragments themselves invite us to identify with the “sons of science.” Our attention, like theirs, is focused on the speech that seems directed at us. Read on this level, neither fragment is an adequate argument. These “refutations” are rhetorical, meant to persuade a certain kind of man who can contribute to the instauration, but who does not need or is uninterested in the new science’s foundations. Their persuasive force is more important than their soundness. What matters is that these men become less enthralled to the old authorities, that they adopt a new way of studying nature. Each takes aim at the errors peculiar to its audience. Neither, therefore, is a general preparative. They point only imperfectly to the new philosophy.

But another perspective is possible. The narrative frame of *Redargutio* invites us into a private deliberation between men who, like the speaker, have found their own way to the new philosophy and who share an interest in converting others. Read on this level, these fragments suggest the possibility of a more general and genuinely philosophical critique. They spur the right kind of reader to look for that one “common accusation” that comprehends the whole philosophical tradition and the natural functioning of the mind. They point to a new teaching about nature and man—a *methodology*—presupposed by the method to be practiced by the sons of science. And taken together, these fragments show a philosophical founder how to modulate the way he talks about the instauration.

1.6.4 Writing in the New: Bacon's Surveys of Learning

Three times—once in *Temporis partus masculus* and twice in *Redargutio philosophiarum*—the narrator points to another sense in which these refutations are incomplete preparatives. “On waxen tablets you cannot write anything new until you rub out the old,” he warns. “With the mind it is not so; there you cannot rub out the old till you have written in the new.”¹⁴⁰ It is not enough to clear away the “sham philosophers” or to raze the old edifice.¹⁴¹ The old learning cannot be effaced without some new teaching to take its place.

Those refutations do make some effort to write in the new. Both try to rub out the old, speculative goal of philosophy and write in a more practical goal. And with a little effort, the narrators’ refutations can be turned into positive assertions. If Aristotle is the “cheap dupe of words,” we can be on guard against language’s distortions. If Plato is a “deluded theologian,” we can insist on a healthier separation of faith and reason. If Plato wrongly sought truth through introspection, we can seek it in the things of nature. Those critiques also gesture toward substantive claims about nature and man: nature is infinite, immensely varied, and ungoverned by final causes; custom is rightly understood as “anti-nature.”¹⁴² But in *Redargutio* and *Temporis*, these new teachings are incidental to the task of refuting the old learning.

In his more public works, Bacon takes another tack, introducing many of his innovations by reoccupying old philosophical terms. To be effective, this strategy must be an open secret. In the *Advancement of Learning*, for example, he explains his reasons for retaining the old term, *metaphysics*. “I desire, it may bee conceiued,” he says,

that I vse the word METAPHISICKE, in a differing sense, from that, that is receyued: And in like manner I doubt not, but it will easilie appeare to men of iudgement, that in this and

¹⁴⁰ *TPM* (F, 72). See also *RPb* (F, 103 and 132).

¹⁴¹ *RPb* (F, 109).

¹⁴² *TPM* (F, 71).

other particulers, wheresoeuer my Conception & Notion may differ from the Auncient, yet I am studious to keepe the Auncient Termes. For hoping well to deliuer my selfe from mistaking, by the order and perspicuous expressing of that I doe propounde: I am otherwise zealous and affectionate to recede as little from Antiquitie, either in tearms or opinions, as may stand with truth, & the proficiencie of knowledge.¹⁴³

Bacon invites us to think about the issue of language in political terms. He wishes, “as much as lyeth in my Penne, to ground a sociable entercourse between Antiquitie and Proficiencie” by retaining the old terms. Aristotle was not so peaceable. Bacon accuses him of framing new words to “confound and extinguish all ancient wisdom.” Here he likens Aristotle to his scholar, Alexander, “the one to conquer all Opinions, as the other to conquer all Nations.” Elsewhere, Bacon compares Aristotle to an Ottoman king who secures his reign by slaying his brothers.¹⁴⁴ Better than either is Augustus Caesar’s example, “according to the Moderate proceeding in Ciuill gouernment.” Augustus called himself a consul while taking to himself more power than he ever held as a triumvir. “[T]he State had been revolutionised,” says Tacitus, “and there was not a vestige left of the old sound morality.” But there was peace and cheap corn, “and there were magistrates with the same titles.”¹⁴⁵ Only a few, old men who had lived in the republic could be sensible of the altered use of those retained terms.

Of course metaphysics is not, for Bacon, the science of divine being or being in general. Bacon’s newly drawn divisions of natural philosophy fundamentally alter Aristotle’s natural-philosophical program.¹⁴⁶ The introduction of a practical and productive branch into what had been a wholly theoretical natural philosophy is no small emendation. Neither is his reassignment of

¹⁴³ *AL* II (*OFB* IV, 81).

¹⁴⁴ *NO* I §67 (*OFB* XI, 107-09). See also *CV* (F, 84).

¹⁴⁵ Tacitus, *Annals*, trans. Alfred John Church and William Jackson Brodribb (Franklin Center: Franklin Library, 1982), I.3-4.

¹⁴⁶ I discuss Bacon’s modifications of Aristotle’s natural philosophy in Chapter 3.

Aristotle's four causes into two separate sciences.¹⁴⁷ He nevertheless uses Aristotle's terms. The only way to make himself understood is to use old words, words everyone shares, while trying to shade their meaning.¹⁴⁸ Innovations stoke opposition if they are too boldfaced. They graft better if introduced in the guise of old forms. Reoccupying Aristotle's words, forcing them to take on meanings Aristotle never intended, is far more effective than any refutation.

The *Advancement* as a whole aims at a well-disguised reoccupation of the received sciences. The preface to Book II obscures this aim. There Bacon proposes "to make a generall and faithfull perambulation of learning."¹⁴⁹ Progress will come from building on the accomplishments of the past. He is more forthcoming in *Distributio operis*. "It should not appear strange," he cautions, "if I sometimes depart from the familiar divisions." He intends "to import certain useful things" into the review and, since "the received divisions only suit the received sum total of the sciences as it now exists," he must need "apply partitions of the sciences which embrace not only those already discovered and known but also those hitherto left out and which should be included."¹⁵⁰ He intends, that is, to recast the "sum or universal description of the knowledge or learning which the human race at present possesses" according to the divisions proper to his new science.

Bacon's new divisions, in fact, rework the whole of human knowledge. The structure of the sciences need not reflect nature's own structure. Instead, like the papers in a secretary of state's private cabinet, the sciences should be organized according to man's use.¹⁵¹ Or, as he said in *Valerius Terminus*, the "plainest method and most directly pertinent . . . will be to make distribution of the sciences, arts, inventions, works, and their portions, according to the use and tribute which they

¹⁴⁷ *AL* II (*OFB* IV, 82). Formal and final causes belong to metaphysics; material and efficient causes to physics. Cf. *NO* II §9 (*OFB* XI, 215), which omits final causes altogether.

¹⁴⁸ See also *NO* I §34 (*OFB* XI, 77).

¹⁴⁹ *AL* II (*OFB* IV, 61).

¹⁵⁰ *DO* (*OFB* XI, 27).

¹⁵¹ *AL* II (*OFB* IV, 133).

yield and render to the conditions of man's life."¹⁵² Where the ancients divided the sciences according to their proper objects, mistakenly trusting the "obvious" but superficial articulation of nature into natural kinds, Bacon makes, at the highest level of generality, a "subjective" division of the sciences. He divides all knowledge into three sciences answering to the three basic faculties of the human mind: memory corresponding to history, imagination to poetry, and reason to philosophy.¹⁵³ This division of scientific labor—memory gathering together the material that reason works on—suits Bacon's understanding of method, not Aristotle's.

Bacon also insists on dividing knowledge according to its different sources. "The knowledge of Man is as the waters," Bacon says, "some descending from above, and some springing from beneath, the one informed by the light of Nature, the other inspired by divine revelation."¹⁵⁴ These two sources become two distinct fields: revelation reveals God's will, but says nothing about man or nature; reason opens up God's power, teaching us about nature and man but obscuring God Himself. Unless we want a heretical religion and a fabulous philosophy, the two should be kept apart. In sundering the two, Bacon undoes in one blow the medieval synthesis of reason and faith.

Despite these radical changes, the *Advancement of Learning* manages on the whole to look basically conservative. The advancement and proficiency of learning seems to be continuous with the tradition while effectively subverting it. Men of judgment will understand Bacon's quiet revolution. Everyone else, like the Roman youth, will enjoy the peace and abundance the revolution brings without their opinions and prejudices being upset.

¹⁵² *VT* (*SEH* III, 234).

¹⁵³ *AL* II (*OFB* IV, 62).

¹⁵⁴ *AL* II (*OFB* IV, 76).

1.6.5 *Writing in the New: Bacon's Use of Old Fables*

Bacon sometimes tries a different strategy for writing in the new. In *De sapientia veterum*, Bacon interprets thirty-one ancient fables, pretending to have recovered from them an ancient philosophical wisdom. He puts forward that ancient teaching as the true teaching without mentioning its affinity with the most important teaching of his new science. In place of an instauration of the sciences, Bacon proposes to restore or recover an originally pure and robust philosophy that had, over time, become corrupted or forgotten.

Bacon never seriously hoped to recover and restore an adequate philosophy of nature from mythical sources, just as he cannot be bothered to draw up the calendar of philosophical sects he says would be so useful.¹⁵⁵ He warns us that men have long and often “tried to twist the fables” in order “to gain the sanction and reverence of antiquity for doctrines and inventions of their own.” Though he could have done so easily and with impunity, Bacon assures us that he has no interest in feigning an ancient lineage for his novel ideas. He has other, more venerable reasons for putting forward his new science in the guise of old fables. “Parables,” he says, “have been used in two ways, and (which is strange) for contrary purposes, both “to disguise and veil the meaning” and “to clear and throw light upon it.”¹⁵⁶ Bacon, too, will use the fables both to disguise himself and to throw light on his new ideas.

Fables or parables have long been used “as a method of teaching, whereby inventions that are new and abstruse and remote from vulgar opinions may find an easier passage to the understanding.” Those who wish to impart “knowledge which is new and foreign from opinions received,” he says elsewhere, have “a double labour; the one to make themselves conceived, and the other to prove and demonstrate; so that it is of necessity with them to have recourse to similitudes

¹⁵⁵ *AL* II (*OFB* IV, 91-92).

¹⁵⁶ *DSV* Preface (*SEH* VI, 698).

and translations to express themselves.”¹⁵⁷ It is a general and wise rule “that whatsoever science is not consonant to presuppositions, must pray in aid of similitudes.”¹⁵⁸

Now Bacon certainly thought his ideas were new and inconsonant with popular opinion. Words in their usual and literal sense poorly convey his radically new notions. Perhaps his innovations could be fit out in stories, not to hide his meaning, but to open it up and make himself better understood. And familiar stories, if they could be made to serve, would better accomplish this goal than fables newly composed. Bacon knows “very well what pliant stuff fable is made of, how freely it will follow any way you please to draw it, and how easily with a little dexterity and discourse of wit meanings which it was never meant to bear may be plausibly put upon it.”¹⁵⁹ He uses their pliancy to his advantage. His inventive interpretations give his new teachings some grossness, condensing abstruse notions into more concrete and vivid narratives. Such similitudes give us only an imperfect understanding, but without them Bacon’s readers might “haue passed ouer without Marke, or else reiected for Paradoxes, that which was offered; before they had vnderstoode or iudged.”¹⁶⁰ For example, because it is difficult and opposed to common opinion, Bacon’s teaching that nature has three states and that art can vex nature out of its ordinary course could easily be rejected, passed over, or misunderstood. But we can get some purchase on the idea and are more open to it when Bacon compares matter to Proteus, the divine herdsman who could be made to “turn himself into all manner of strange shapes.”¹⁶¹

Bacon also uses the fables to disguise himself and turn us against the old philosophy. He takes as a propitious sign the fact that Homer, Hesiod, and other good-for-nothing Greeks did not invent the myths, “for I should not have thought of looking for anything great or lofty from such a

¹⁵⁷ *AL* II (*OFB* IV, 125).

¹⁵⁸ *AL* II (*OFB* IV, 125).

¹⁵⁹ *DSV* Preface (*SEH* VI, 695).

¹⁶⁰ *AL* II (*OFB* IV, 125).

¹⁶¹ *DSV* (*SEH* IV, 725-26).

source.” These “sacred relics and light airs breathing out of better times” are a kind of ark, preserving a more ancient wisdom from the taint and corruption of Greek philosophy. By appealing to a more ancient wisdom, Bacon weaponizes the pre-historical past against Plato and Aristotle. His esteem for the Presocratics can be similarly explained.¹⁶² He blames the Socratics, especially Aristotle, for the loss or corruption of that once-great wisdom, conscripting these unremembered authors and the Presocratic natural philosophers in his coup against the authority of the reigning philosophy.

The Socratics stand in the way of Bacon’s instauration. By appealing to Democritus and Heraclitus or the fables’ unknown authors, he opens up a more ancient alternative to Socratic philosophy. Because their texts are so fragmentary and figurative, Bacon’s interpretations shape that alternative. And since that alternative is more ancient than the Socratics, he could put forward a teaching fundamentally opposed to theirs without any obligation to refute it. At the same time, Bacon’s interpretations cloak his own novelty. The conceit of a forgotten poetical wisdom, like his selective use of Presocratic fragments, provides Bacon with malleable material that he can freely reshape to express his own teaching in another’s voice.

1.7 Philosophy’s Two Tribes

Bacon’s different rhetorical strategies suggest different relations between the old science and his new science. He sometimes trumpets the radical novelty of his instauration and the newness of its principal instrument. Other times, he talks as if his new science were only an extension or

¹⁶² See John C. McCarthy, “Bacon’s Third Sailing: The ‘Presocratic’ Origins of Modern Philosophy,” in *Early Greek Philosophy: Reason at the Beginning of Philosophy*, ed. Joe McCoy (Washington, D. C.: The Catholic University of America Press, 2013), 162: “A primary incentive for Bacon’s return to the dawn of Greek philosophy is to enlist its help in a campaign, waged over the entire course of his adult life, to discredit the philosophy of Aristotle.”

continuation—an *advancement* and *proficiency*—of the old science. And sometimes he pretends to have re-discovered the new science from the wisdom of the ancients.

There remains another possibility, one we probably would not think of if Bacon did not suggest it. The new and the old need not be inimical. Modernity can *adjoin* antiquity without obliterating it; can claim its own *adjacent* authority without rivaling the ancients' own, *adjoining* claim. That is Bacon's proposal in the preface to *Novum organum*.

Let there then (since it is favourable and fortunate for both) be two sources and two dispensations of learning, and likewise two tribes or clans or thinkers or philosophers in no way hostile or set apart from each other but allied and bounded by ties of mutual assistance; and lastly let there be one policy for cultivating the sciences but another for discovering them.¹⁶³

Unlike the special sciences, philosophy's field had always been perfectly universal; no subject of inquiry was out of bounds. Bacon proposes to divide the field. Each man, looking to his tastes and talents, can choose his tribe. Bacon can broker a kind of peace if each is willing to limit its territorial claim. Each can enjoy uncontested its proper authority, the old philosophy over things human, religion over things divine, and the new philosophy over nature.

The unnamed speaker in *Redargutio philosophiarum* had suggested a similar division. He will not ask these sober men to renounce the old philosophy, no matter how impoverished. Because it “does not flatter the mind by fitting in with its preconceptions” or “sink to the capacity of the vulgar except in so far as it benefits them by works,” a man who practices the new philosophy will not be popularly esteemed. “Therefore keep your old philosophy,” the speaker counsels. “Use it when convenient” and “profess it in public.” The new philosophy should guide their study of nature, but

¹⁶³ *NO* Preface (*OFB* XI, 57-59).

they should use the old philosophy “to deal with the populace.” The old philosophy is a “mask” men of “superior understanding” wear in the presence of “inferiors.”¹⁶⁴

The speech aims to flatter both us and the monologue’s imagined audience. Surely they and we would like to believe that we belong to a superior class of men. We get caught up because the text permits us to share in the secret. We witness fifty or so judicious men being won over to the new philosophy, finding the speech “worthy of the greatness of the human race” and themselves “like men who had come suddenly out of thick shade into the open light,” who “were for the moment dazzled, but carried with them a sure and happy augury of better sight to come.”¹⁶⁵ One of that company, now a devotee of the new philosophy, eagerly reports what he heard to a friend no less eager to hear it. Its avid reception, if not the gentleman’s speech itself, sways us to the cause of the new philosophy. We are, whether we realize it or not, being initiated into the mysteries.

In *Redargutio*, we see a man “speak freely among friends.” We get his advice third-hand, in an unpublished writing, prefaced by an anonymous author, who heard it from an unnamed friend, who heard it, in a foreign country, from an unnamed lecturer. When in *Novum organum* Bacon distinguishes between the old and the new philosophy and allows them a peaceful coexistence, he speaks publicly and in his own name. By publishing, he cannot so easily single out his audience. Still, his rhetoric seems calculated to embarrass the old learning and dare us to pursue the new:

And to those who are better pleased by the [old philosophy] from haste or the concerns of civil life or because they lack the mental capacity to take in and embrace the [new philosophy] (which will necessarily be the case for most people), I hope that they achieve their ambitions in what they are doing and get what they are after. But if it be dear to the heart of any mortal men not to stick only with existing discoveries but to penetrate further, and not to overcome an opponent in disputation but to conquer nature in operation, and in fine not to express pretty and probable opinions but to acquire certain and ostensive knowledge, let such people (if it be the right course for them) join hands with me as true

¹⁶⁴ *RPb* (F, 108).

¹⁶⁵ *RPb* (F, 133).

sons of the sciences to leave behind nature's entrance halls (trodden by countless feet), and at last throw open the doors to her inner sanctum.¹⁶⁶

What serious man would choose pretty and probable opinions to certain and ostensive knowledge?

What natural philosopher would not want at last to throw open the doors of nature's inner sanctum?

Bacon finds in a more public setting another way to woo the willing.

Perhaps once initiated these newly recruited sons of science will receive the same advice about using the old philosophy as a mask to hide their true beliefs. But here, Bacon permits the old philosophy an expanded role. In *Redargutio*, wise men publicly profess the old learning to hide their true beliefs. Here, the suggestion seems to be that the old philosophy should be genuinely labored by men who confess it sincerely. And, if we are to take Bacon at his word, philosophy as a whole will be better for it. "Allied and bounded by mutual assistance," the old and the new learning together contribute to the advancement of the sciences and the greater mastery of nature.

There is, I believe, a serious meaning to Bacon's proposal for a divided philosophy. At first, Bacon's willingness to admit the old philosophy looks like modesty and a hesitation to offend. He is anxious that his innovations not dishonor the ancients:

it happens (as I think) by good fortune from the point of view of stifling and suppressing conflict and inflamed passions, that the honour and reverence due to the ancients remains intact and inviolate while I can carry out my plans and still reap the harvest of my moderation. For if I were to declare that I did better than the ancients while pursuing the same path that they did, no crafty words of mine could prevent people from comparing or arguing over our respective intellectual merits, talent, or ability. . . . But since my business is to open up a completely new route for the intellect, one unknown and untried by the ancients, the case is altered: zeal and faction cease and I merely bear the part of a guide, a post of modest authority held more by a kind of luck than talent or ability."¹⁶⁷

Because antiquity is powerless to halt new additions, the reconciliation between the old way and the new rests on novelty's courtesy, and novelty should be content to make its additions graciously,

¹⁶⁶ NO Preface (OFB XI, 59).

¹⁶⁷ NO Preface (OFB IX, 57).

without defacing or defaming. But Bacon's gesture is more than courtesy. His argument for a new organon depends on the excellency and intelligence of the ancients. If the ancients could have done any better with their old organon, if they were not the best and most intelligent of human beings, then their shortcomings could be blamed on indolence, weakness, or incompetence. But since the ancients were in fact great, we cannot blame them for failing to produce consensus or anything of real use. And since Bacon has already shamed us out of blaming the subtlety and hiddenness of nature, the ancients' method and comparative inexperience must stand accused. Thus he cleverly turns our esteem for the ancient philosophers into an argument against their method. Bacon gladly concedes that he is no match for the ancients' intellectual firepower, that he has only discovered a new path for the intellect. He cannot draw a straighter line or describe a more perfect circle by hand, but he has what the ancients did not: a straightedge and a compass. And if all Bacon is proposing is an alternate method, a second "source" or "dispensation" of learning, then the old philosophy need not be refuted at all.

Bacon's ecumenicism also points to a genuine need for the old philosophy. To be sure, his concession to the received philosophy at times seems tongue-in-cheek. The old philosophy can still be used "to nourish disputations, embellish discourse, and supply work for professors and short cuts to men of affairs." But he immediately follows this lackluster list with a sober assessment of the limitations of the new philosophy and the popular understanding: "And so I freely admit and declare that the philosophy which I adduce will be of very little use in these matters. It does not lie ready to hand; it cannot be picked up in passing; it does not flatter the intellect with preconceptions; and does not descend to vulgar understanding except in its utility and effects."¹⁶⁸ The "matters" the new philosophy cannot handle competently are much broader than Bacon here lets on. They include all

¹⁶⁸ *NO* Preface (*OFB* XI, 57-59).

“the sciences which rest on opinions and dogma” where “the object is to command assent and not things” and those arts that “serve to strengthen the sinews of civil life” and that function as “a common currency which men take as legal tender.”¹⁶⁹ The new philosophy can command nature, but it cannot—or cannot yet—command assent, and assent is often what matters most. Crucially, for example, Bacon’s new science and the mastery over nature it promises will come to nothing if he cannot persuade men to follow him.

The special excellence of the new method makes it dependent on the old method. “*Anticipations* are far better at sustaining assent than *Interpretations*”—Bacon’s term of art for his new, methodical philosophy—“because as they are gathered from a few facts, and those of the most everyday kind, they at once impress the intellect and fill the fantasy.” Anticipations must falsify nature in order to more generally command assent. “*Interpretations* on the other hand, gathered from facts extremely various and widely dispersed, are incapable of striking the intellect suddenly, so that they cannot but sound harsh and discordant to current opinion and almost like the mysteries of faith.” We need a new method because the mind is plagued by Idols. Because we can never wholly or generally overcome those Idols, we must also continue to depend on the old method. As long as the common run of men live by opinion and dogma rather than “certain and ostensible knowledge,” there will be a need to speak to those governing beliefs. That is the necessary concession the new science must make to the older and more popular science. Even if all men become habituated to the rigors of the new method, should we all become sons of science, we may yet need Anticipations if Bacon’s induction from “facts extremely various and widely dispersed” lead to axioms and laws that tell us too little about ourselves and how we should conduct our lives, or if we cannot make sense of

¹⁶⁹ NO I §29 (OFB XI, 75) and NO I §128 (OFB XI, 191).

or accommodate ourselves to the new science's conclusions. And if we can interpret only what we have first anticipated, methodical philosophy may need *methodological* philosophy as a starting point.

Nevertheless, Bacon at times seems determined to try whether the new science can stand alone. He provocatively suggests that, in time, the new philosophy will achieve a methodical knowledge of man. "Someone will also put it forward as a doubt rather than an objection," he says,

whether I speak of natural philosophy alone, or whether I also speak of perfecting the other sciences—logic, ethics, and politics—by taking the route I have mapped out. Now I do indeed mean it of all the things just mentioned. For just as the common logic, which runs things by syllogism, reaches not only to the natural but also to all the other sciences; so mine, which advances by Induction, takes in everything.¹⁷⁰

The ambition of the new philosophy is all-encompassing. It "takes in everything." Ethics and politics are the chief examples of those sciences thought better left to the old philosophy because of its ability to command assent, but they, too, will one day be the province of the new philosophy. Bacon is already at work on histories and tables of discovery concerning "anger, fear, shame and so on, and also ones to do with examples of civil business," memory, and judgment.¹⁷¹ Should these sciences of human things become far advanced, perhaps the new philosophy could replace the old as the authoritative teaching. Still, it was the old teaching that revealed anger, fear, shame, and the rest as possible objects of methodical inquiry and passions relevant to civil business. The new philosophy may be, in this sense, at least, forever dependent on the old philosophy.

Perhaps it does not matter whether this adjacency is provisional or permanent, merely a mask or a necessary capitulation to the limitations of each. Neither the old nor the new philosophy governs itself. The new science will be guided, he says, by true religion and right reason, but it is Bacon who grants those charters and stands judge over the three. He is the supreme legislator who decides how to understand the Christian ethical imperative to relieve man's estate, what reason can

¹⁷⁰ NO I §127 (OFB XI, 191).

¹⁷¹ NO I §127 (OFB XI, 191).

competently handle, and what must be left to faith. He is careful to disguise his rule. He provides biblical sanction for the new arrangement. He retains the older but more humane philosophy, granting it some limited authority in matters ethical and political. The new science provides a third public face for Bacon's rule, the inventions and discoveries that will prolong life and make it more pleasurable. Christianity, the old philosophy, and the new science are all masks Bacon wears to conceal his own non-methodical philosophical rule.

1.8 Retrofitting Tradition: Bacon's History of Philosophy and Salvation History

Stepping back, we can see that the Instauration's six parts trace a trajectory from philosophy's past to the philosophy of the future, from the old philosophy to the new and complete science. Left to itself, the old philosophy would never progress to a true and active science. Bacon is the inflection point, the bridge between the old and the new. To give philosophy a future, he also had to give philosophy a past. "In fact," says Graham Rees, Bacon "invented yesterday almost as much as he invented tomorrow, and yesterday became emphatically a bad place to be."¹⁷²

Socratic-Aristotelian philosophy is not the only tradition Bacon's refounding upends. He is the subject of a Christian king, writing to other Christians in a time of intense religious upheaval. He needs to inspire his Christian audience—Protestant and Catholic alike—to put their faith in his untried reforms and their hope in his bid to relieve man's estate by becoming nature's master. For them, Christian salvation history is, more than the history of philosophy, the relevant context for Bacon's proposals.

¹⁷² Graham Rees, Introduction to *OFB* IX, xlvii.

We can draw together Bacon's various accounts of the relation between his new philosophy and the philosophical and biblical traditions by fitting them into a single narrative. Looked at this way, the Instauration's first part is a story Bacon tells about the past in order to make sense of his new beginning, an idiosyncratic history of philosophy embedded in a heterodox recapitulation of salvation history. In what follows, I will recount that history and show how Bacon solves the rhetorical and political problem by reshaping the philosophical and biblical traditions.

1.8.1 Tradition and Progress

Bacon was not the first to fit philosophy and learning into a historical narrative. But in these older histories, man's greatest days lie in the past. Stephen Gaukroger suggests another Bacon's—Roger's, not Francis's—as the standard model for a Christian history of philosophy.¹⁷³ Adam, the story goes, was the first philosopher, possessing wisdom through direct revelation. What wisdom survived the Fall was preserved and passed down, through flood and the confusion of tongues, from the sons of Noah (who taught the Chaldeans) to King Solomon. From Solomon, it was transmitted, by way of the Egyptians (who were also taught by Abraham), to the Greeks, though in a confused and fragmented form. Plato and Aristotle were heirs, then, to the wisdom of Adam, Noah, Abraham, Moses, and Solomon. That inherited wisdom had to be filled out and perfected through the Christian revelation and subsequent tradition of theological and philosophical thought. Wisdom was not the hope of some far-off future, but a fragile and time-worn legacy, revived by the

¹⁷³ Stephen Gaukroger, *Francis Bacon and the transformation of early-modern philosophy* (Cambridge: Cambridge University Press, 2001), 74-75. See also Roger Bacon, *Opus Maius*, ed. J. H. Bridges, 3 vols. (London, 1897-1900), iii.54-68.

teachings of the incarnated Christ, elaborated by the fathers of the church, and enriched through the continued historical unfolding of God's providential plan.

In outline, Roger Bacon's history finds its pagan counterparts in Hesiod, Ovid, and Virgil's accounts of the Golden Age. Once-great man has steadily declined, over time, in strength, wisdom, and virtue. We will never surpass our fathers, just as they never surpassed theirs. In this autumn of the world, no one should expect greater feats, purer morals, or truer opinions from men so degenerate. We should look to our fathers' fathers both to know how to live and what to think. That an idea or argument originated in the distant past was, for a believer in the Golden Age, no argument against it, but rather a sign of its good stock. The thought of the past formed a tradition whose authority grew as it aged. The older an idea is, the more reverence it deserves.

To justify his own science, Bacon's history of philosophy needs to reverse that story of decline. One of his better-known tropes inverts the Golden Age myth. By a truer reckoning, he says, it is we who are ancient. For we have a longer and wider experience of the world, and so we can draw from it truer and more general axioms than Plato, Aristotle, Augustine, or Aquinas could from their more limited experience. The lack of any historical sense and geographical confinement doomed older thinkers to an intellectual parochialism. "In matter of knowledge," Bacon conjectures, our ancestors were

but as the dawning or break of day. For at that time the world was altogether home-bred, every nation looked little beyond their own confines or territories, and the world had no through lights then, as it hath had since by commerce and navigation, whereby there could neither be that contribution of wits one to help another, nor that variety of particulars for the correcting of customary conceits.¹⁷⁴

If the Greeks were the boyhood of science, we are its well-seasoned men, better traveled and possessing greater historical perspective. The history of philosophy, that is, follows the same

¹⁷⁴ *VT* ch. 5 (*SEH* III, 225). Cf. *NO* I §72 (*OFB* XI, 115-17).

developmental arc as a living being, growing eventually to maturity. Or, as Bacon often repeats, truth is the offspring of Time. As Time moves forward, knowledge progresses, and just as we surpass our fathers, we are destined to be surpassed by our sons.

Yet in another well-known metaphor, Bacon compares time to a river that carries down to us only what is light and blown up, letting sink opinions of greater weight and solidity.¹⁷⁵ Progress is not inevitable or uninterrupted. Time itself more likely frustrates progress than furthers it, committing what is best to oblivion and making us heir to history's flotsam. The sciences have sometimes waxed. More often they have waned. But the fault is ours, not Time's. Bacon's history of philosophy doubles as a critique of the old philosophy, especially the old philosophers' view of tradition and history. That critique aims to bring about the conditions necessary for a new, progressive tradition. Bacon's story needs to persuade us that we are not as well off as we imagine and, at the same time, to inspire hope that, through our own efforts, tomorrow can be better than today.

1.8.2 The First Condition of a Progressive Tradition: Bacon's History of Philosophy as Critique of Received Learning

To institute a new, progressive tradition, Bacon must first persuade us that progress is necessary, that we are not as well off as we have imagined. An "opinion of plenty is among the greatest causes of poverty," Bacon warns, "and as faith in the present leads us to neglect true helps in the future, it is useful and actually necessary on the very threshold of our work to rid ourselves of excessive respect and admiration for things discovered already."¹⁷⁶ The *Advancement* and *De augmentis*,

¹⁷⁵ See, for example, *AL* I (*OFB* IV, 29). Cf. *CV* (*SEH* III, 612 / F, 94).

¹⁷⁶ *IM* Preface (*OFB* XI, 11).

his inventories of learning, aim to show us, in part, how much of the intellectual globe lies unexplored and unimproved. In *Novum organum*, he instead catalogs “signs” that show that “current philosophies and studies are in a bad way.”¹⁷⁷ Strung together, those “signs” outline Bacon’s critical history of philosophy.

Bacon divides history into three, brief periods of learning and the vast intellectual wastelands separating them. History runs, in Bacon’s day and by Bacon’s accounting, to about twenty-five centuries, but “scarcely six . . . were productive of sciences and helpful to their advancement,” and even those efforts have been misdirected.¹⁷⁸ Natural philosophy flourished most among the Greeks, at least until Socrates “brought philosophy down from the heavens to the Earth,” turning men’s industry from natural to moral philosophy.¹⁷⁹ Even those few Greeks who rigorously pursued natural philosophy were corrupted by ambition and a weakness for novelty. The second period of learning—the Roman period—was devoted to moral philosophy and public affairs. The third revolution of learning is less clearly bounded, but is unmistakably Christian. For “once Christian faith had been received and become established, by far the greatest number of the most outstanding minds gave themselves to theology,” and it was theology that received social and institutional support. This turn from things human to things divine led not just to the neglect of natural philosophy, but to its “obstruction.”¹⁸⁰ So we have not spent much time in learning, and even in those few productive centuries, natural philosophy has not been well or much labored. “It is no wonder,” Bacon concludes, that “men made no progress with it, absolutely absorbed as they were in other occupations.”¹⁸¹

¹⁷⁷ NO I §70 (OFB XI, 113).

¹⁷⁸ NO I §78 (OFB XI, 123-25).

¹⁷⁹ NO I §79 (OFB XI, 125-27).

¹⁸⁰ NO I §79 (OFB XI, 125-27).

¹⁸¹ NO I §79 (OFB XI, 125-27).

Bacon's history of philosophy focuses his critique on the Greeks, especially Socrates and his followers. "[T]he whole of our great learning is merely a surviving fragment of Greek philosophy." For, he asks, "suppose we leave aside the Greeks (and they are only a handful), what have the Romans, or Arabs, or our own age to offer, that is not drawn from the discoveries of Aristotle, Plato, Hippocrates, Galen, Euclid, and Ptolemy, or is reducible to them?"¹⁸² Beginning from the same starting points and employing the same principles of demonstration, Roman, Arabic, and European philosophy are merely elaborations or modest extensions of those Greek beginnings. Not even the Christian appropriation of Plato and Aristotle meaningfully alters the path on which the Greeks had set it. Philosophy, both natural and moral, has been indelibly stamped by the character of its first men. Philosophically, we are all Greeks.

And so philosophy's failures are Greek, too. Bacon singles out one failing in particular, alluding to the indictment Plato had put into the mouth of an Egyptian priest: "You Greeks are always children."¹⁸³ The Greeks, says the priest, have no ancient beliefs, no long tradition, and no mature science because their ancestors have been periodically destroyed by floods. Lacking history, the Greeks lack knowledge. Forced again and again to start anew, Greek arts and sciences have never ripened, and so have never yielded fruit. But for Bacon, the Greeks' juvenescence is a character flaw, not an accident of geography or bad luck. Like precocious boys, they "prattle but cannot procreate."¹⁸⁴ Even their virtue has been misspent, for their mental strength has made them "professorial by habit," quarrelsome and headstrong where they should be docile, intellectually precipitate where they should be more cautious and methodical. The Greeks, in short, are all talk and no action; just so much prideful and impatient mental agitation producing plenty of arguments

¹⁸² *RPb* (F, 106).

¹⁸³ *NO I* §71 (*OFB XI*, 115). See Plato, *Timeaus*, 22b.

¹⁸⁴ *NO I* §71 (*OFB XI*, 115).

but no useful works. A true philosophy would continue to advance, tend toward unity, and lead to the discovery of useful inventions, but the philosophy we have inherited from the Greeks neither grows nor produces. Questions remain questions, controversies continue unresolved, and “one can scarcely adduce after all this time a single experiment that tends to help and alleviate the human condition.”¹⁸⁵

Having traced the arts and sciences to their Greek origins, Bacon generalizes his argument, rooting his historical argument in a more fundamental, non-historical argument.¹⁸⁶ His history of philosophy begins from those contingencies of time, place, and character, but attempts to ground those accidents in the the mind’s fallible nature. Philosophically we may all be Greeks, but the Greeks are Everyman. They are remarkable only because they are the starkest example we have of how thought can go wrong and how, once rooted, error can persist. Time alone could never remedy our ancestor’s narrowness or, on its own, build up knowledge. Pursued in the Greek manner, knowledge more probably degenerates than grows. Thought flourishes most in its first authors because ambitious men write books wishing above all to be believed and because the men who read them are too indolent and credulous. The polity of science has always been and will always be popular, Bacon laments. Man on average is too impatient, too lazy, and too willful to submit himself to the hard search for knowledge. These failings, though, are not localized, the special affliction of some particular time or place. They are man’s hard lot.

¹⁸⁵ NO I §73 (OFB XI, 117)

¹⁸⁶ See NO I §115 (OFB XI, 173), where Bacon says that the “destructive part” of consists in “three refutations, namely the refutation of *Native Human Reason* left to itself; the refutation of *Demonstrations*; and the refutation of *Theories*, or of received learning and doctrine.” Cf. Graham Rees, Introduction to OFB XI, xliii, and Stephen Gaukroger, *Francis Bacon and the Transformation of Early-Modern Philosophy*, 111. Rees describes Bacon’s catalog of signs as a “new weapon: a profoundly historicized interpretation of the causes and conditions which, in his view, had made all the philosophies fail.” Rees treats “time, place, human fallibility, and . . . national character” equally as “contingencies.” Gaukroger takes Bacon’s turn to “signs” in a similar spirit. “It is now ‘signs’, that is, the distinctive characteristics of a doctrine that enable us to evaluate its content, or, more generally, the distinctive characteristics of an age than [sic] enable us to evaluate the cultural products of that age, rather than the content of particular theories or doctrines, that guides Bacon’s interpretation of the philosophers of antiquity.”

This more general critique broadly agrees with the biblical account. Looked at in the wider perspective of salvation history, it is not Plato and Aristotle, but Adam and Eve who are responsible for our contemplative and practical misfortunes. In Adam, Bacon shows us an exemplar of speculative success and man's mastery of nature. Of course the Fall changed everything, and to know that man, before his transgression, could name and command the animals must be, for us, very little comfort indeed. Through our Fall we lost, not only our innocence, but also our God-granted mastery over nature and that non-discursive knowledge by which Adam named the animals. "However, both of these losses can to some extent," Bacon says, "be made good even in this life, the former by religion and faith, the latter by the arts and sciences."¹⁸⁷ Our original charter, forfeited through our most grievous fault, can in some measure be reclaimed if in our theorizing we can stop being (as were Socrates, Plato, Aristotle, and their kind) adolescent boys and again become (as the biblical parable puts it) like little children.¹⁸⁸

Bacon, however, is careful to qualify that recovery. He never promises Paradise regained. The commerce between mind and things, whether it ever existed naturally, can be restored only through an artificial method. Never (or never again) will we have an intuitive knowledge of nature and nature's essences. If the situation at creation had been propitious for knowledge, it no longer is. If man once laborlessly enjoyed the earth's fruits, he must now sweat for them. The science by which Bacon would give us mastery over nature is itself a labor, giving us, at best, better tools with which to tend our weed-strewn gardens. Through mastery we can hope for a prolongation of life, but never again will we be deathless. When Bacon says we can make our losses good through science, he does not mean that we can remove their causes, only that we can ameliorate their effects.

¹⁸⁷ *NO II* §52 (*OFB XI*, 447).

¹⁸⁸ *NO I* §68 (*OFB XI*, 109).

This recovery depends not on returning to some more original condition, but in the progress and advancement of the arts and sciences.

Progress in the arts and science is neither easy nor assured. Though God created man for wisdom and mastery, his Fall forever marred man's contemplative and practical fortunes. Solomon, who asked God above all else for wisdom and knowledge (2 *Chronicles* 1:8), takes Adam's place, offering us, it seems, an example of contemplative success in a Fallen world. But whereas Adam in Paradise was wise, Solomon is only a lover of wisdom. Philosophy, or the loving search for wisdom, is all that is possible for man once he forfeited his Edenic wisdom. We are not now wise, but we can be, up to a point.

In marking that limit, Bacon defers to Solomon's authority. Putting together several biblical passages, Bacon takes Solomon to mean that "God hath framed the minde of man as a mirrour, or glasse, capable of the Image of the vniuersall world," and that "nothing parcell of the world, is denied to Mans enquirie and inuention" for (quoting from *Ecclesiastes*) "*The Spirite of man is as the Lampe of God, wherewith hee searcheth the inwardnesse of all secrets.*"¹⁸⁹ Indeed, God "hath placed the world in Mans heart," but in his Fallen state "yet cannot Men finde out the worke which God worketh from the beginning to the end." Man's contemplation must be kept within its proper limits: up to second causes, but not to first causes.

1.8.3 *The Second Condition of Progressive Tradition: Bacon's History of Philosophy as an Argument for Hope*

Bacon's story manages to persuade us that we are not as well off as we had imagined, but in doing so risks sinking us in that despair that is "by far the greatest obstacle to the advancement of

¹⁸⁹ *ALI* (OFB IV, 7).

the sciences.”¹⁹⁰ Nature is obscure, life is short, the senses deceive, and judgment is error-prone, and so the sober man naturally doubts that science could progress much beyond its current state.

Bacon’s criticisms have strengthened those causes for doubt and introduced new suspicions. So like Columbus before him, Bacon “must open and lay out my conjectures which make hope in this business probable.”¹⁹¹ The same story that convinced us of our poverty must also inspire hope that tomorrow can be better than today.

By grounding the old philosophy’s errors in deficiencies native to human reason, Bacon brings both philosophy and human reason to a moment of crisis. His solution is to convert the crisis of reason into a crisis of tradition. If the failings of philosophy are ahistorical, Bacon’s solution is not. The intellectual tradition has not been building toward his new method. Its discovery is radical, a break. At a particular moment, in a particular place, Bacon proposes a new beginning premised, it seems, on some new revelation or new dispensation vouchsafed to him. Why now? What makes Bacon’s present a privileged moment in the history of learning, an inflection point setting science in a new and more vital direction? Believers in the Golden Age theory of history have no reason to expect to reverse man’s decline through some new founding of knowledge. Even if we took Bacon’s inversion of the Golden Age theory seriously, would not tomorrow be more propitious than today?

To explain why his own time and place is favorable for a renewal of learning, Bacon makes a strange appeal to Providence. Had not the prophet Daniel foretold Bacon’s coming?¹⁹² Bacon takes Daniel’s prophecy—that “*Many shall go to and fro and knowledge shall be increased*”—to mean “that it was fated (i.e. Providence so arranged it), that thorough exploration of the world”—Magellan’s circumnavigation and Columbus’s discovery of the new world—“and the growth of the sciences”—

¹⁹⁰ *NO I* §92 (*OFB XI*, 149).

¹⁹¹ *NO I* §92 (*OFB XI*, 151).

¹⁹² See, for example, *NO I* §93 (*OFB XI*, 151).

Bacon's discovery of the art of discovery—"would meet in the same age."¹⁹³ Since his source is biblical, nothing compels him to equate Fate and Providence, and given what he has said about the causes of the Greeks' ignorance, we might wonder if the link between wider exploration and the growth of knowledge requires Providence.

Still, giving philosophy a privileged historical moment and a mysterious new revelation is rhetorically convenient. It justifies abandoning the philosophical tradition without the need for a philosophical argument and helps legitimize Bacon's new beginning (though not his end). Salvation history gives Bacon a ready and widely-accepted narrative about historical change and a persuasive way to talk about his refounding. Our true blessedness lies in the future, not the past. We need not return to Eden or even the faith of Abraham and Moses. Nor need we wait expectantly for a messiah or a Second Coming to inherit a heavenly kingdom. The wisdom and power Adam forfeited through his transgression can be regained, in part, only if we look ahead rather than behind. Made charitable and disciplined by Bacon's method, science will, in time, relieve man's poor earthly estate and usher in the Kingdom of Man.

Bacon's history of philosophy likewise inspires hope by loosening our attachment to the past, directing us instead to a future good. He began his argument for hope with God and turned then to Daniel's prophecy, but the sum of past errors is "the reason which above all others affords grounds for hope."¹⁹⁴ Before Bacon, Jean Bodin and Louis Le Roy (Regius), among others, had argued for the superiority of the moderns to the ancients.¹⁹⁵ But where they were satisfied with a catalog of new discoveries and modern accomplishments, Bacon offers, in fair detail, a novel account of the causes of the present's comparative riches. And many of the same "signs" Bacon

¹⁹³ NO I §93 (OFB XI, 151).

¹⁹⁴ NO I §94 (OFB XI, 151). Cf. NO I §93 (OFB XI, 151).

¹⁹⁵ See, for example, Jean Bodin's *Methodus ad Facilem Historiarum Cognitionem* (1566) and Louis Le Roy's *De la vicissitude ou variété des choses en l'univers* (1575).

brought forward to convince us of our poverty can, if looked at in the right way, can give us reason to expect better in the future.

Those ancient errors leave open the possibility that nature really is methodically knowable and that man really can master nature. We just have not gone about the work in the right way. But because the fault is in us rather than in nature, a cure may be possible. The sum of past errors is thus “the reason which above all others affords grounds for hope.” For “if you had done everything associated with your duty, and your affairs were still in no better state, there would be no hope left that they could be changed for the better. But since your affairs are in a bad way not through force of circumstance but because of your blunders, you should hope that by leaving the blunders behind or by righting them, your affairs can take a great turn for the better.”¹⁹⁶ Now that the errors have been exposed—and Bacon’s turn to the causes of hope gives him an opportunity to rehearse all those criticisms again—we can root them out and purge them.

If we are careful, we will see that Bacon’s historical argument undermines his argument about the future. The ancients, so the historical argument goes, did not try the right path. But their past failure points to our future success only if there are some few ways to pursue truth (a premise Bacon makes explicitly), one or more of which leads to genuine knowledge. But that second premise is just the conclusion Bacon wishes to urge on us. We can have no up front guarantees that Bacon’s new way will achieve what the ancients could not. But the historical argument succeeds in shifting responsibility for the future from history or nature or God to man. Our original sin is recast as poor method. It matters not if we blame the mind’s Idols and nature’s obscurity on our transgression or if we believe that nature in its “natural” constitution is ill-suited to satisfying man’s needs. Either way our situation is the same and, if we limit ourselves to the remedies available in *this* life, so are the

¹⁹⁶ NO I §94 (OFB XI, 151-53).

resources we have to improve our lot. Solomon asked God for wisdom and knowledge. Bacon instead urges us to take on ourselves the work of advancing the arts and sciences. Progress depends on a new regiment of the mind. Salvation is a matter of self-improvement.

1.8.4 Using Tradition to Uproot Tradition

Truth is the offspring of time, then, not because of some dark dispensation of history, but because art is long, life is short, and the proficiency of learning requires that the sciences be better governed. But progress is impossible as long as “prudent and rigorous men” leave discovery to chance and as long as “men of serious and penetrating judgement” believe “that with the revolutions of the world’s ages there are certain times and tides in sciences,” that philosophy, like every other human activity, is subject to history’s vicissitudes, that if circumstances are favorable, the sciences progress but that, if Fate refuses to smile or the stars don’t align, learning degenerates.¹⁹⁷ Bacon believes he has found a way to break history’s cycle, to make a new and more hopeful beginning that will make possible an unbroken progress in the sciences. Man can approach the limits of his knowledge by means of a method and a new tradition of science that makes provision for “the impediments as shortness of life, ill conuinction of labours, ill tradition of knowledge ouer from hand to hand, and many other Inconueniences, whereunto the condition of Man is subiect.”¹⁹⁸

The traditional understanding of tradition—tradition as the faithful preservation and passing on of the wisdom of the past—is fatal to progress. There can be no hope for growth in the sciences until pupils have the courage to go beyond their masters, to no longer content themselves with

¹⁹⁷ *NO I* §92 (*OFB XI*, 149-51).

¹⁹⁸ *AL I* (*OFB IV*, 7).

explicating the discoveries of other men.¹⁹⁹ Enthralled to Greek wisdom and bound by the old laws of Aristotle's organon, we languished. Bacon has come to put us under a new law, to promote the advancement and proficiency of knowledge and so, too, our worldly salvation.

To lead us to the promised land, Bacon must first free us from our Greek masters. He turns Christian authorities against the Greek philosophers. Like Bacon, St. Paul had warned us that the Greeks were great talkers.²⁰⁰ Isaiah had urged the Israelites to remember "the rock from which ye were hewn," to remember that they belong to the nation with which God blessed Abraham and that, if they have the purity and firmness of Abraham's faith, the Lord will comfort them and make Zion's deserts like Eden. Bacon, alluding to Isaiah, asks us, too, to remember "the rock from which ye were hewn" and "to reflect that the nation whose authority you follow is the Greek."²⁰¹

But Bacon does not mean to free us from the Greeks only to return us to other and older authorities, to Moses's laws, or Abraham's faith. The old and ancestral must cede its authority and make way for the new. Bacon audaciously interprets *Jeremiah* 6:16 as giving biblical sanction to this novel relation between the old and the new. Jeremiah had said (in the Vulgate's Latin translation), "*state super vias et videte et interrogate de semitis antiquis quae sit via bona et ambulate in ea et inuenietis refrigerium animabus vestris et dixerut non ambulabimus*"—"stand ye in the ways, and see, and ask for the old paths, where is the good way, and walk therein, and ye shall find rest for your souls." Bacon's (mis)quotation, however, makes no such identification between the old ways and the good ways—"State super vias antiquas, & videte quanam sit via erecta & ambulate in ea."²⁰² Bacon makes plain how we should understand the prophet's words: "Antiquity deserveth that reuerence, that men should make a stand thereupon, and discouer what is the best way, but when the discouery is well taken then to

¹⁹⁹ See *IM* Preface (*OFB* XI, 17).

²⁰⁰ See *Acts* 17:21.

²⁰¹ *RPh* (*F*, 109). Bacon is quoting from *Isaiah* 51:1. See also *Colossians* 2:8.

²⁰² *AL* I (*OFB* IV, 28).

make progression.”²⁰³ We walk in the old ways only until we are ready to make our own judgment. The good ways, the ways in which we should walk, are Bacon’s new ways.

Neither *Genesis* nor *Ecclesiastes* nor Daniel nor Bacon’s critique of ancient philosophy can ground hope in Bacon’s new science. If, as Bacon says, his instauration demands that the work of the intellect be started again from the beginning, the past—neither its success nor its failures—can inform our judgment of the new science’s chances for success. But Bacon makes an historical “argument” against the tradition because he needs to loosen its grip on us. Since there can be no hope of philosophically deciding between the two, we are free to choose between the ancients’ well-traveled path and Bacon’s untrod way. Unable to dispute principles, Bacon focuses the comparison on the only common measure we can make between the old and the new philosophy: their operative success in mastering nature.²⁰⁴ The facts of history stand in place of the philosophical argument, giving us reason to choose the new over the old. The ancients’ way has led to impassable brambles, unresolved questions, and endless disputations. If we now choose to follow them, we should not expect a better outcome.

That we have a choice between ways means we no longer owe any allegiance to the customs and opinions we have lived by. Having ceded its authority, the tradition becomes something we can

²⁰³ The quotation also shows up in *Essays*, “Of Innovation” (*OFB* XV, 75-76) and *CBP* (*LL* III, 105). Charles Whitney makes much of the misquotation. See his *Francis Bacon and Modernity*, 92-94. Brian Vickers does not notice the misquotation in his *Francis Bacon: The Major Works*. Michael Kiernan provides the Vulgate original, and notes Whitney’s discussion of the “spectacular misquotation,” but stops short of endorsing Whitney’s conclusions. See *OFB* XV, 224 n. 40.

²⁰⁴ Gaukroger again mischaracterizes Bacon’s historicism: “Using an evolutionary conception of societies and their intellectual cultures, Bacon is able to argue that we would naturally expect natural philosophy to find better conditions for its nurturing in a culture which had reached maturity, rather than in one in which society was still in its childhood. In other words, he is able to argue that what is possible in the modern era far outstrips anything that was possible in antiquity without even making a comparative assessment of their achievements, because the point depends on what it is possible to achieve in particular cultures, not on what has actually been achieved, although he does, of course, have independent criticisms of classical society in the latter respect” (Gaukroger, *Francis Bacon and the transformation of early-modern philosophy*, 114-15). In fact, Bacon’s argument is a comparison of fruits, and far from claiming that antiquity was fated by history to a wayward science, Bacon juxtaposes his method to theirs. It is a question of ways, and if the ancients had adopted his method — and there is nothing that precluded it — they would have easily achieved what he says his new philosophy will accomplish.

take up or leave behind as we choose. This new relation to the past is, in brief, what we mean by *modern*: it is up to us just how continuous we want our lives to be with the past, how much we will adopt our ancestors' ways. We cannot help but understand ourselves by our past, but now it is a chosen past, fragmented and pasted-up. Bacon, standing at a particular point in time, consciously chooses what to carry forward and what to leave behind. Consider his description of the Instauration's first part in *Distributio opera*. He promises to "display the sum or universal description of the knowledge or learning which the human race at present possesses," but also to "import certain useful things." Those additions change the whole and require "perforce changes in its parts and sections."²⁰⁵ This recapitulation of the arts and sciences will retrofit them for incorporation into the new science. The old is made new in being appropriated; the past becomes just so much material with which to build a future of our own design.

1.9 The Dialogical Problem

Bacon's new method demands to begin at the beginning, to make a fresh start. Made public, that demand leads to the rhetorical and political problem the solution to which I have described in the three preceding sections. The same demand for a new beginning also leads to what I earlier called Bacon's *dialogical* problem.

Bacon's dialogical problem is just that political or rhetorical problem translated into the realm of thought. Bacon cannot depart completely from the old ways if he hopes to rule over the vanquished and order their labor and lucre to his new purposes. Politics must make certain concessions to the past. So, too, must reason. Reason may demand an absolute beginning but finds

²⁰⁵ DO (OFB XI, 27).

itself surrounded by opinions and notions that it cannot just ignore. Even in the realm of thought, a completely new beginning is impossible.

A totally new beginning would require, first, an impossible critique. Bacon is a relative latecomer. The intellectual territory he wants to claim is already inhabited. To establish his new modes and orders, he will have to contend with those rivals. But without agreed-upon principles and modes of demonstration, any attempt to refute Aristotle or Plato would concede too much. The debate necessarily would be on their terms and judged according to their criteria. So in place of a refutation of their philosophies, Bacon must somehow make a compelling case for abandoning the old philosophy without altogether discrediting reason's ability to know the world and guide man toward his good. That case, I argued above, is necessarily *methodological*, based on a critique of ancient philosophy rather than some direct experience of nature. In the next section, I will refine that claim by arguing that Bacon's critique of ancient philosophy is at bottom a *prudential* critique. His way is preferable to the old way just because it better achieves or is more likely to achieve the human good.

There is a second way in which reason cannot make a totally new beginning. Like everyone else, Bacon has, since birth and without the guidance of method, built up an understanding of the world shaped by language and authoritative opinions. To talk about his innovations, he will have to use the words available to him, those of the court, the marketplace, and the theological and philosophical traditions, the very words that give voice to old prejudices and serve as tokens of the mind's rashly abstracted notions. If he hopes to communicate a new vision, he must begin with the old, shared vision.

But communication is not the only problem. As far as starting points go, Bacon has nothing answering to Descartes's *cogito ergo sum*. For him, there is no primitive fact, intuition, or judgment from which the remaining universe of facts, intuitions, and judgments can be deduced. He wants

instead to rely “on the evidence of things.” For “new discoveries must be sought from the light of nature, not fetched back out of the darkness of antiquity.”²⁰⁶ Bacon wants to trade the authority and the judgment of eminent men for the testimony of nature itself. But he also questions our ability to competently and impartially hear nature’s testimony. Nature hides; the mind is a distorting mirror, unfaithfully intermixing its own corrupt nature with nature’s pure light. The unqualified truth of things does not show up simply and self-evidently. Because the mind errs in its first motions, he proposes a “new and certain pathway” that begins with the intellect’s first movements, starting “from the perceptions of the senses themselves to the mind.”²⁰⁷ Bacon could not tell us how best to study nature if he did not himself have some *methodological* knowledge of what nature is. These are the guiding *anticipations* of nature—the *idea of nature*—I will discuss in the last section of this chapter.

Even if Bacon could send us back to some undistorted and more basic experience, the kind from which we could induce truer notions of “the lowest species—*Man, Dog, Dove*” and “the immediate impressions of sense—*Hot, Cold, White, Black*,” we could not start to make sense of it without some memory of the world as it shows up in our pre-methodical experience of it.²⁰⁸ Think of Hobbes’s attempt to trace an idea through the machinery of the nervous system to the sensation which is its original. The thought that one could trace something called an *idea* to some other thing called a *precept* is itself impossible to trace to some *precept*. We wouldn’t know what to go looking for if we didn’t already possess, even in a rough or tentative way, some knowledge of the thing it was meant to explain, or the kind of explanations that could be offered. Or think of Descartes’s attempt to build an entire philosophy from the evident truth that *I exist*. This one truth alone withstands his programmatic doubt. But the next steps—proving that God exists and mediates in a reliable way our

²⁰⁶ NO I.122 (OFB XI, ??).

²⁰⁷ NO Preface (OFB XI, 53).

²⁰⁸ NO I §16 (OFB XI, 69-71).

experience of a truly existing external world—is impossible unless we retain, after doubting away all our opinions, the ideas of *God* and *external world* and *experience*. We do not have to affirm anything about them, but they must be available as placeholders or possible objects of inquiry. Without the ghosts of those ideas, we would be stuck, alone in our solipsistic bubble. Bacon’s story about how the mind comes to its parochial picture of the world does not make that picture any less necessary as a starting point. We cannot build or rebuild a truer model of the world out of more basic experiences without keeping that less adequate model in mind.

Nor is there reason to suppose that so elaborate a structure as the sciences could be rebuilt from scratch. As imperfect as the sciences are, they offer a sophisticated schema for organizing knowledge. Rather than raze that structure, Bacon chooses to appropriate it and refit it for his purposes. Consider his use of words like *form* and *metaphysics*. He has, as we have seen, political or rhetorical reasons for using Aristotle’s words. But the tradition also frames Bacon’s thinking. The proper division of the sciences and the proper object of metaphysics can be questions for him only because Aristotle had already taken a stance. Constructing a completely new science from its very foundation is therefore out of the question. Both the tradition of philosophical speculation and the “natural,” ordinary, or pre-philosophical experience of the world, although they are corrupt and superficial, are the scaffolding necessary to build his new science, approximations of nature that methodical science depends on even as it corrects them.

Despite what he says, then, Bacon begins, not with things themselves but, like Socrates, with others’ accounts of those things. His access to nature is *mediated*; his thinking is thinking *against*. He confronts the ancients not only because their opinions are popularly believed, but because their articulations of our naïve experience of the world are the necessary steppingstones to his new science. His own thinking depends on these traditions and pre-philosophical articulations. The true

beginning or foundation of his new science, and so also his new idea of nature, is his critique of the old science and the old idea of nature.

1.10 Bacon's Prudential Critique of Socratic Philosophy

Bacon's new beginning requires an argument against the old philosophy. Our review of Bacon's rhetorical strategies pointed to a deeper critique of the ancients. According to the speaker in *Temporis partus masculus*, they "share a common guilt and might well have been confounded in a common accusation."²⁰⁹ Our reflections on Bacon's refounding suggest that his deeper critique cannot be based on the kind of knowledge of nature that is impossible for a mind constituted like ours. Our reflections also suggest that Bacon's deeper critique is the presupposition of his new method rather than one of its results. We know something about what that critique *is not*, but we need a more definite sense of what it *is*.

Bacon's new logic differs from the old or common logic "in three ways especially: in its end, order of demonstration, and the inquiry's starting point."²¹⁰ Bacon lists the errors as if they were equal, but in the *Advancement of Learning*, he had said that "the greatest Error of all the rest, is the mistaking or misplacing of the last or furthest end of knowledge."²¹¹ That mistake about the end of knowledge, I will argue, is the heart of Bacon's "common accusation." His critique is at bottom *prudential*: we should abandon the old way and try his new way because of the human good it promises.

²⁰⁹ *TPM* (F, 70).

²¹⁰ *DO* (OFB XI, 29).

²¹¹ *AL* I (OFB IV, 31).

1.10.1 Bacon's Teaching about the Human Good is Methodological

FRANCIS
OF VERALUM
REASONING THUS WITH HIMSELF
CONCLUDED THAT
it would be in the interest of the living
and of those yet to come
to hear his words.²¹²

So begins Bacon's *Instauratio magna*. Our present interests and the good of future generations justifies the effort and care Bacon asks us to invest in reading his book and realizing the ambitious program it outlines. About our current and future good Bacon offers no authority save his own. He somehow knows, without the benefit of method, what we do not, that method is needful. He knows of no one else who has seen, as he has, how diseased man's intellect is and how our ignorance results in "countless disadvantages." So great are those goods that he is willing to "stake everything on a victory for art in its race against nature," and take upon himself and his new philosophy an unprecedented responsibility for mankind's welfare.²¹³ And though it is the new philosophy that will achieve those goods, it is Bacon himself who gives to philosophy its new goal.

Svetozar Minkov worries that Bacon, in making the case for his project to master nature, has not followed his own advice or reached his "conclusions in full compliance with his own call for a 'gradual and continuous ascent' from 'the senses and particulars.'"²¹⁴ Indeed, he does not. John McCarthy, following Richard Kennington, shows that "method does not explain itself," that Bacon's method "is constituted by properly philosophical reflection" and "the result of pre-methodical

²¹² *IM* Proem (*OFB* XI, 3).

²¹³ *NO I* §117 (*OFB* XI, 177).

²¹⁴ Svetozar Minkov, *Francis Bacon's "Inquiry Touching Human Nature": Virtue, Philosophy, and the Relief of Man's Estate* (Lanham: Lexington Books), 11. He is quoting Bacon's *NO I* §§19, 22, and 24.

investigations.”²¹⁵ Bacon’s teaching about the human good grows instead out of a critique of the old philosophy. His reasons for rejecting the Socratic goal of philosophy—and, Bacon believes, the whole philosophical tradition is Socratic—are, in turn, the key to understanding his critique of the Socratic starting points and order of demonstration, and so also his new science and his new idea of nature.²¹⁶

1.10.2 *The Greeks’ Beautiful Cosmos, God’s Very Good Creation, and the Dualisms that Save Them*

Long before Bacon took upon himself a general instauration of the sciences, Plato’s Socrates abandoned “the old method of investigation” and took up “a confused method of [his] own.”²¹⁷ He calls his confused method a *deuteron ploun*, a second sailing. As a young man, Socrates was “wonderfully keen on that wisdom which they call natural science.” He offers as examples the search for the material and efficient causes of nutrition and knowledge. Searching for these causes led him to unlearn what he thought he knew, not (as he says) because he lacked aptitude for this kind of investigation, but because being and becoming cannot be explained satisfactorily by material and efficient causes. Neither the unit itself (the material cause) nor its drawing nearer to another unit (the efficient cause) explains how one becomes two. It seems at first that the drawing together of

²¹⁵ John C. McCarthy, “The Good and the True in Early Modern Philosophy” (presentation, American Political Science Association Convention, San Francisco, CA, August 29, 2001), 7.

²¹⁶ Richard Kennington, on the contrary, argues that ‘Bacon’s critique of the ancients is limited to the order of demonstration and the starting point: it does not offer a critique of the end, for example, of the ancient view of the good.’ Bacon rejects the end or goal of ancient philosophy because of its theoretical shortcomings: “Bacon understood the ancient end as inseparable from the entire ‘way of contemplation’ of the ancients in its tripartite character. By showing that the defects of the ancient *ordo demonstrandi* and starting point were traceable to their purely contemplative end, Bacon has already given his critique of that end; no additional critique specific to that end is required.” See Richard Kennington, “Bacon’s Critique of Ancient Philosophy in *New Organon* 1,” in *On Modern Origins: Essays in Early Modern Philosophy*, eds. Pamela Kraus and Frank Hunt (Lanham: Lexington Books, 2004), 20 and 28. But compare his statement, in “Descartes and Mastery of Nature,” that “Bacon’s endeavor is best understood as a critique of the antihumanitarianism or nonhumanitarianism of ancient political philosophy” (*On Modern Origins*, 125).

²¹⁷ Plato, *Phaedo*, in *Complete Works*, ed. John C. Cooper (Indianapolis: Hackett Publishing Company, 1997), 97b. Subsequent references to this and Plato’s *Apology*, found in the same collection, will be to Stephanus page numbers.

two units is the cause of their becoming two, but then it seems just as true that it is separation or division that causes one to become two. A single effect should not be explainable by two opposite causes.

Anaxagoras seems to offer the solution. “It seemed good to me, in a way,” Socrates tells Cebes, “that Mind should be the cause of all. I thought that if this were so, the directing Mind would direct everything and arrange each thing in the way that was best.”²¹⁸ The good, Socrates confesses, is a “cause of things after my own heart.”²¹⁹ Reading Anaxagoras dashed his hopes. Anaxagoras “made no use of Mind, nor gave it any responsibility for the management of things, but mentioned as causes air and ether and water and many other strange things.”²²⁰ But Socrates sits in prison not because his bones are held together by flesh and flexed by sinews. No. The “true causes” are the Athenians’ decision that it was better to condemn him and Socrates’s decision that it is best to submit to whatever penalty they levied. The specific character of bone, sinew, and flesh are not causes, but make possible the real cause, rational decisions to act for the sake of the good.

Because neither Anaxagoras nor any other man could teach Socrates how to explain things by appealing to the good, he cautiously sets out on his own. Things themselves are too blinding; better, he judged, to “take refuge in discussions and investigate the truth of things by means of words.”²²¹ Refuge is not resignation. Philosophy better begins, not in direct contemplation of beings, but in an examination of our opinions, articulated in speech, about those beings. The retreat to speeches about beings remedies the chief defect of the materialist accounts Socrates found wanting: speeches allow the good to show up as a cause. Rational speech reveals what the senses alone cannot perceive and allow him to investigate, as hypotheses, “a Beautiful, itself by itself,” as well as “a

²¹⁸ Plato, *Phaedo*, 99c.

²¹⁹ Plato, *Phaedo*, 97d.

²²⁰ Plato, *Phaedo*, 98b-c.

²²¹ Plato, *Phaedo*, 99e.

Good” and “a Great and all the rest” as causes of all that is.²²² He turns to speeches, then, to focus his search on certain kinds of causes—what we call formal and final causes—and to demote the search for material and efficient causes which, on their own, tell us nothing about the good.

Socrates’s choice of examples is important. He is sitting in jail awaiting execution because he and the Athenian jury acted in order to achieve what they each *believed* was the good. So the many *apparent* goods can also be causes, at least of human action. And both the Good and apparent goods must capitulate, in part, anyway, to necessity. Reason can try to persuade but cannot compel the non-rational. Socrates’s decision achieves only a second-best outcome. For Socrates could not persuade the Athenian jury that, by asking his irksome questions, he provides the greatest private and public goods or that, for his service to the city, he deserved to be fed at the public’s expense.²²³ Man acts for the sake of the good only insofar as he knows and loves it, and only insofar as he has power to achieve it. It is all the more surprising, then, that Socrates claimed not to know or teach the human good. But this much, at least, he knows: in our condition of ignorance, there can be no greater good for a man than to discuss virtue every day.²²⁴ We may never become wise, but we will be better for inquiring. Philosophy is the highest life just because we are ignorant, because we are always on the way to knowledge.

Though he does not know the Good to be the cause of all that is, Socrates’s life is premised on and a kind of evidence of the efficacy of the Good. Whether Socrates really believed that the Good was the cause of all, he certainly acted *as if* it were. Think of Socrates, coatless and unshod, standing in the cold, lost in contemplation. Think of him refusing to plead with the jury on behalf of his young sons or dismissing, on the morning of his execution, his distraught wife. He is, of course,

²²² Plato, *Phaedo*, 100b.

²²³ See *Apology* 30d-31b and 36c-e.

²²⁴ Plato, *Apology* 38a.

choosing philosophy above bodily comforts and the welfare of his family, but he is neither insensible nor callous. He has friends who will take care of his wife and children, and even if they fail, his family will be fine because nature is basically good and satisfies our true needs. Besides, philosophy would be pointless if the world were not minimally intelligible and reason were wholly unable to know it. Socrates's retreat to speeches demonstrates his trust in the ability of our words, and so also our thoughts, to latch on to reality. And because nature provides, his philosophizing need not be so urgent. We need not know now or soon. We can afford leisure. We can afford to keep talking, day after day, about virtue and the soul and everything else.

Aristotle, too, taught that serious men will pursue a life dedicated to moral or intellectual virtue. Their commitments are plausible only if the world is basically good, if the wealth of nations and the weal of men is assured or worth little. Trusting too much to the goodness of nature, they valued too lightly the goods that make a life of any kind possible. Aristotle, to be sure, understood that the virtuous man depends on certain external goods. Born in the wrong city or to the wrong parents a man is unlikely to become virtuous. Without health it is hard to be moderate or courageous. Without wealth, it is impossible to have the leisure necessary for philosophy or the wherewithal to be magnanimous. But these external goods are, for the most part, beyond our control. Nature is either basically good and supplies, usually or for the most part, the external goods we need to be happy, or virtue and happiness depend to a troubling degree on good luck.

God's providential care for man, even after the Fall, gave Christians surety against chance. God created the earth and all its abundance for man's use and delight, asking in return only that Adam and Eve be good stewards of His creation. He made Abraham, who doubting God's promise had taken Hagar as wife, the father of a people more numerous than the stars of the heavens or the sands of the seashore. God will put right even what we wreck through our free choices. The New

Testament exceeds those Old Testament assurances. Jesus reminds us that God takes care of the birds, that sow not nor reap nor gather into barns, and arrays in glory the lilies of the field, that neither grow nor toil nor spin. What man, he asks, can add a cubit to his stature or an hour to his life by worrying? Do not lay up your wealth, he enjoins, but give it away and follow me. That same Jesus told Martha that her sister, Mary, had chosen the better part. Compared to His company, the housework and host duties are not worth her care and trouble. He multiplied the loaves but told the devil that man does not live by bread alone. Your daily bread will be given to you if you but ask. He cured the blind and healed the sick but counted earthly health and life nothing in comparison to the health of one's soul and eternal life with God. Christians and Socrates are, in this, at least, alike: man need not be anxious about what we call, sometimes pejoratively, his basic or necessary goods. God or nature will provide us what we need, freeing us to philosophize or seek our salvation.

Socratic philosophy and biblical faith alike trust in the basic goodness of the eternal cosmos or the divinely created world. Experience tested that trust more often than it confirmed it. The providential or teleological accounts of the world always had to face the undeniable fact of human suffering or, more generally, the gap between what *is* and what *is good*. Both the Greek philosophers and Christian theologians found ways to square our experience of suffering with the view that nature or its Creator are basically good. In Plato's *Timaeus*, the demiurge had to capitulate to necessity. The world is only as good as he was able to make it. More broadly, Plato's Socrates said that the Ideas, unembodied and perfect, are the really real. The things of the world and our everyday experience are only copies or shadows imperfectly participating in the being and intelligibility of the Ideas. Nature in itself is perfect. Only its instantiation is flawed. Aristotle, while denying the separate existence of the Forms, could still account for any deficiencies of the real by the unavoidable compromise between material and formal principles. Even if nature never acts in vain, it is the cause only usually

and for the most part. The remainder we must credit to chance. The Stoics, too, saved the teleological view by defining man's true needs as the very goods that nature first inclines us to and then, if we live according to nature, supplies. The Greeks invented any number of dualisms to explain the fractures in their beautifully ordered cosmos.

The solution was harder to come by for the Church Fathers whose God is the omnipotent creator of everything *ex nihilo*. Matter, because God created it, could no longer be blamed, and the demiurge's excuse is not available for an all-powerful God. He declares each part of His creation good and the whole very good. The world, as God created it, cannot be indifferent or hostile to man's good. Adam and Eve's transgression, freely chosen, changed the situation. God puts nature in the service of justice. Thorns and thistles now grow where once God planted every tree pleasant to the sight and good for food. Banished from Eden, Adam and Eve will eat in sorrow and the sweat of their face the fruit of the earth, cursed because of their rebellion. Eve will bring forth children in sorrow, a poor substitute for the immortality she and Adam forfeited. From dust they came, and to dust they and their children all will return. While nature no longer perfectly supplies man's needs, God does not abandon His creation. Providence provides what nature no longer can. God will redeem man, restore him to eternal life, and bring about the salvation he should never have needed.

1.10.3 Bacon's Prudential Argument against Teleology and Providence

Nothing more starkly distinguishes modern thought than the loss of the pre-modern faith in nature's goodness. Thomas Hobbes, Bacon's one-time amanuensis, pictured human life unimproved by man's industry and wit in somewhat darker colors: in "continual fear of violent death," man's life

is “solitary, poor, nasty, brutish, and”—what may be a blessing, on these terms—“short.”²²⁵ Man, aided by his art and science, must rely on himself to improve his fortunes. The “things really useful to the life of man, and such as the necessity of subsisting made the first commoners of the world look after,” says John Locke, receive their “value from human industry.” By “a very modest computation” he estimates “that of the *products* of the earth useful to the life of man nine tenths are the *effects of labour*: nay, if we will rightly estimate things as they come to our use, and cast up the several expences about them, what in them is purely owing to *nature*, and what to *labour*, we shall find that in most of them ninety-nine hundredths are wholly to be put on the account of *labour*.”²²⁶ We owe thanks to nature and its Creator for graciously satisfying only one one-hundredth of our true needs. The rest is our doing. “Land that is left wholly to nature,” he adds, “that hath no improvement of pasturage, tillage, or planting, is called, as indeed it is, *waste* and we shall find the benefit of it amount to little more than nothing.”²²⁷ Nature, rather than providing for man, imperils him, and so man seeks his good by fleeing nature and the God Who abandoned him to it.

Hobbes’s and Locke’s words are better known, but the idea was Bacon’s first. Bacon, no less than Socrates, feels deeply man’s ignorance, but draws from that common starting point radically different conclusions. Our “manifold ignorance,” he says, leads to “countless disadvantages.”²²⁸ Philosophy’s ambition must be to expose the causes of our ignorance and provide for its remedy in order in some degree to “subdue and mitigate [men’s] needs and miseries.”²²⁹ His turn to mastery supposes that the good is not to be found in nature, but is something we must put there ourselves; that the good is a cause only insofar as we labor to remake nature. The doubt about nature’s

²²⁵ Thomas Hobbes, *Leviathan*, ed. Edwin Curley (Indianapolis: Hackett Publishing Company, 1994), Part I, ch. 13, para. 9.

²²⁶ John Locke, *Second Treatise of Government*, ed. C. B. Macpherson (Indianapolis: Hackett Publishing Company, 1980), ch. 5 §39.

²²⁷ Locke, *Second Treatise of Government*, ch. 5 §42.

²²⁸ *IM* Exordium (OFB XI, 3).

²²⁹ *DO* (OFB XI, 37).

goodness is not, however, peculiarly English. “We are much beholden to *Maccianell* & others,” Bacon bravely confesses, “that write what men doe and not what they ought to do,” unlike those old philosophers who made “imaginary Lawes for imaginary common-wealths, & their discourses are as the Stars, which giue little light because they are so high.”²³⁰ Bacon is, like Machiavelli, quite sure that we can leave behind Socrates’s endless talk about imagined virtues, take our fortune into our own hands, and set to work achieving real, solid, and unambiguous goods.

But what evidence supports their rejection of the ancient philosophers’ ideals? Man had, long before Machiavelli, Bacon, Hobbes, and Locke, suffered death and disease, war and famine. The greatest Greek historians chronicled man’s hard lot. Herodotus and Thucydides were no worse acquainted with human suffering than were the modern philosophers who read them. The Bible, too, shows us man toiling, anxious, and careworn, beset by enemies, enslaved, persecuted, surviving, as best he can, pestilence and plague and drought. He journeys, wearied, through a vale of tears, knowing that he, like all the living, will one day die. The ancient philosophers themselves were not blind to man’s situation. From their own starting points, man’s ignorance, moral failings, and suffering are just what we should suspect. They tried to do just what Machiavelli and Bacon seem to demand: they looked around and saw the way men actually live. Their account of human and non-human nature squares with their experience of the human situation. Some few are drawn to philosophize, a few more are capable of the highest public virtue, but most men waver between a tepid virtue and moral incontinence. Plato and Aristotle alike knew that reason could not compel the non-rational, that philosophy could not tame the wayward desires of men not already disposed to virtue. Laws can shame or scare men toward right action, but nothing in Socrates’s experience suggests that a city, even a well governed city, can improve men’s fortunes enough to fundamentally

²³⁰ *AL* II (OFB IV, 144 and 180).

alter man's situation. The best city requires an unlikely alliance or is simply impossible. The human good is fragile and man's happiness is limited and subject to chance. Even if the ancients had a more halcyon view of the human condition, the modern revaluation that denies nature's goodness and esteems self-preservation above other, loftier goods cannot be based on the "facts," however hard or obvious they seem. Our experience is, at best, equivocal, and the reality of human suffering cannot decide the issue between the teleological and the anti-teleological views of nature.²³¹

Bacon does not and cannot offer a rigorous theoretical or scientific argument to rule out final causes in nature. In *Novum organum*, he traces the teleological view of nature to the mind's innate Idols. The human intellect is "reckless in the discovery of causes." Dissatisfied, it "lusts after things better known to nature," but, unable to penetrate to first causes, it "falls back on something closer to, namely final causes which obviously come from the nature of man rather than of the universe."²³² Yet the reality of final causes in human affairs is no argument against the reality of final causes in non-human nature, and it is far from obvious that final causes are merely fictions. That inanimate matter acts for the sake of some good strains belief, perhaps, but purposive explanations in biology are not, on their face, ridiculous. Animal and plant development seem purposive, earlier and incomplete stages ordered to the organism's final, mature form. Physiological form, too, looks purposive, the parts ordered to the good of the whole. Poorly adapted or vestigial parts are the exceptions that prove the rule. And animals at least seem to act for the sake of their own good. Teleological accounts that put one being in the service of another's good rely on more ambiguous evidence, but are not evidently false.

²³¹ Bacon, when he credits his discovery of the new logic to God's mercy, even provides a kind of template for how one might turn the denial of a teleological ordering into an affirmation of God's providential care for man.

²³² NO I §48 (*OFB* XI, 85-87)

Bacon's reorganization of natural philosophy, in the *Advancement*, is more circumspect about final causes, but also, I think, more revealing of his reasons for rejecting natural teleology. There he stops short of affirming natural teleology, but neither does he rule it out. The inquiry into final causes must be kept in its proper place, "not because those *finall causes* are not true, and worthy to be inquired," but because "the handling of *finall causes* mixed with the rest in *Phisicall enquiries*, hath intercepted the seuere and diligent enquirie of all *reall and phisicall causes*, and giuen men the occasion, to stay vpon these *satisfactorie and specious causes*, to the great arrest and preuidice of further discouerie."²³³ The ecumenicism that finds no "Enmitie or repugnancie" between explanations depending on "reall and phisicall" causes and those depending on "satisfactorie and specious" causes in fact shows the latter to be superfluous. To say that animal hides are firm in order to protect against extreme heat and cold may truly reveal "an *intention*," but is not as useful as knowing the "consequence" that animal hides are firm because pores contract when they come into contact with foreign and unlike bodies. Plato, Aristotle, and Galen, in pursuing these "discoursing causes," neglected the search for material and efficient causes, which alone unearth nature's real roots and strings and give man power over nature. They preferred the sort of inquiry that satisfied their merely contemplative interests to the sort of inquiry that could promote genuine human goods.

Bacon also suggests that the inquiry into final causes corrupts true religion. What the old philosophers called *final causes* are really God's intentions. Knowledge of final causes, then, would reveal to us something of God's will, which Bacon said could never be revealed to reason, and is just the kind of inquiry that, by mixing religion and philosophy, corrupts both.²³⁴ Or final causes take the place of God. Aristotle, for example, "left out the fountain of final causes, namely God, and

²³³ *AL* II (*OFB* IV, 86).

²³⁴ See, for example, *AL* II (*OFB* IV, 79) and *NO* I §65 (*OFB* XI, 103).

substituted Nature for God.”²³⁵ We would do better to follow the example of Democritus, “who did not suppose a *Minde* or *Reason* in the the frame of things, but attributed the *form thereof able to maintaine it self to infinite essaies or proofes of Nature*, which they tearme *fortune*.” For we can affirm a more *physical* account of nature without calling into question the working of divine Providence. In fact, we can more highly exalt Providence if, denying what Bacon just affirmed about the compatibility between physical and final causes, we understand Providence to accomplish what nature never intends.²³⁶

Bacon’s rejection of natural teleology (and perhaps also divine providence) is grounded, then, not on an impossible theoretical insight, but on a prudential judgment about what kinds of opinions are most conducive to the human good. To make room for the human good, he had to banish the good from nature.

This turn, effected first by Machiavelli and made general by Bacon, grows out of a changed attitude or a basic reorientation. They had, before they could redescribe man’s true situation, to reimagine the relations holding between man, nature, and God. The key, I think, is their refusal to solve the problem of man’s suffering through some dualism or to defer to some ideal or *other* world the reconciliation of the good and the true. They are deeply impatient: of the endless circularity of dialectic, of the old, aporetic philosophy’s restless searching, of the indefinite postponement of man’s happiness and relief, of man’s misplaced faith and the resignation that leaves his good to chance. They are “realists,” allergic to idealisms of all kinds, because they are fundamentally optimistic about man’s ability to know the world and improve his condition if only he would try his strength. Socrates’s teaching that philosophy is a preparation for death is a counsel of despair.²³⁷ So, in its way, is the Christian’s otherworldly hope that in heaven the last shall finally be first. Death

²³⁵ *DAS* III.4 (*SEH* IV, 364).

²³⁶ *DAS* III.4 (*SEH* IV, 364-65).

²³⁷ See *Phaedo* 64a.

cannot really be the necessary condition of knowledge or the remedy to injustice and suffering. Man can, in this life, join together to make a just polity and a progressive science capable of wresting from nature what will satisfy his true wants.

Despair is the greatest obstacle to man's greater knowledge and power.²³⁸ Paradoxically, Bacon cites the old philosophy's failure as the greatest cause for hope in his new philosophy. Had we energetically pursued the right course these two thousand years without any progress, Bacon's greater hope would "doubtless be impudent and reckless."²³⁹ We would be forced to conclude, as "prudent and rigorous men" had before, that the fault lay in "nature's obscurity, life's shortness, the senses' deceits, our fallibility of judgment, the intractability of experiments, and the like."²⁴⁰ We just are not, in our present constitution, suited to know and control nature. But Bacon, like Augustine had before, solves the problem by shifting fault onto man himself. Not nature nor God nor "things themselves" but *we* are to blame for our practical and theoretical failings. It is "the human intellect" and especially "its use and application" that have frustrated our efforts. Unlike Augustine, Bacon believes that, because the fault is in us, it is "capable of treatment and cure."²⁴¹ Our "past errors" can be made "the sum of arguments for future hope."²⁴² The old, faulty philosophy cannot discover its own errors, and we must be freed of those errors before we are ready to take up the new philosophy. Abandoning the old for the new is a choice, somehow both "prudent" and "reckless," or a calculated bet: "I have decided that (unless we evidently wish to be mean of soul) we must make the attempt. For not to try and not to succeed are quite different risks, for by not trying we cast aside an immense good but by not succeeding we lose a little human labour." Because such stakes

²³⁸ NO I §92 (OFB XI, 149-51).

²³⁹ NO I §94 (OFB XI, 151-53).

²⁴⁰ NO I §92 (OFB XI, 149).

²⁴¹ NO I §94 (OFB XI, 151-53).

²⁴² NO I §94 (OFB XI, 151-53).

cannot weigh against so great a prize, both “keen” and “wise and moderate” men will make the wager.²⁴³

1.10.4 Bacon’s Flattening of Old Dualisms

Our inflated sense of our wealth is among the greatest causes of our poverty. The more beneficent we believe nature to be, the less we need to provide for ourselves. Those same dualisms and idealisms that licensed the old belief in nature’s goodness are, in a curious turn, the very same sources of the ancients’ despair in man’s ability to know and control nature. Bacon’s new method is, on one view, what is left once he roots out those old, despairing opinions. He flattens Aristotle’s distinction between form and matter into his own *active* or *appetitive* matter, collapses Aristotle’s distinction between art and nature, and dissolves Aristotle’s distinction between the practical and the contemplative life for basically the same reason: each is grounded in an unsupportable distinction between what *is* and what *ought to be*, between the real and the ideal. Each supposed nature to be a standard that could never, or never reliably, be met.

Here I can only briefly develop and substantiate this immodest claim. The Socratics’ recourse to an ideal or other world is the source of their three broad failures: theoretical, productive, and practical.

Let us begin with the ancients’ *theoretical* failure. They supposed their distinction between the ideal and the real made genuine knowledge possible. Genuine knowledge grasped more or less

²⁴³ NO I §114 (OFB XI, 173). Richard Kennington, in emphasizing the nonmethodical basis of the new goal of science, puts Bacon’s case more baldly: “It does not require, and never possessed, the new natural science, or a new methodical physics, neither of which are found in Bacon’s writings, except in nascent form. Its basis lies in no epistemology, but only in the human knowledge of misery, especially death, and the conviction that it is ignoble not to avenge our subjugation at the hands of a niggardly nature by the exaltation the power of man.” See “Descartes and Mastery of Nature,” in *On Modern Origins*, 128.

directly the unchanging, intelligible principle of being—the form or nature of a thing. Practical wisdom required repeated and varied experience, but theoretical wisdom rested instead on self-evident principles, noetic insight, and syllogistic reasoning. A form is prescriptive, an end or *telos*, that which a being is supposed to be. Forms account for the regularity of nature and its typical “look,” though perhaps not in a very helpful way.²⁴⁴ But forms themselves cannot account for nature’s irregularities. Not that these irregularities—nature impeded—had any value for men who had presupposed that things are most truly their forms. Nature is only what happens usually or for the most part, and so exceptions can be too easily dismissed as nature frustrated. The real cannot judge the ideal, or experience has only a limited veridical role in theoretical knowledge. Lacking a standard or criterion that could judge its theoretical products, the ancients could not reach consensus. Not all their rival theories could be true, and none were known with enough certainty to become authoritative. Without experience to check or brake its theorizing, the mind was free to feign a world more regular and more stable than really is. The intellect comes to rest in opinions that it finds easy and pleasing. The mind, Aristotle had said, is potentially all things. The ancients’ idealizing tended instead to make the world conform to the nature of the mind and the will’s desires.

Their distinction between the real and the ideal also led to the ancients’ *productive* failure. Bacon faults the ancients for failing to produce any new discoveries or useful inventions. That the old science was unproductive cannot, on its own, justify Bacon’s rejection of the ancients. For on the ancients’ own terms, the highest pursuits, including science, are ends in themselves and so by definition not useful. Ancient contemplation sought to behold, not to make. Blessedness is the eternal vision of God, not the enjoyment, in this life, of the fruits of our dominion over nature. The relation they supposed between the ideal and the real elevates the good of contemplation and leaves

²⁴⁴ Molière’s *virtus dormitiva* is funny for a reason.

little room for man's productive power. If the real is the exhaustive instantiation of the ideal, if everything possible is realized, human art can do nothing but perfect or complete nature. Judging the possible by the actual, they sought relief in an impossible ideal instead of an unrealized potential within nature. Or perhaps the real is that subset of the possible that God chose for us. If so, and if some part of what is possible lies within our power to realize, we may nevertheless find it prudent to constrain our art within the limits suggested by His creation. But Bacon, by flattening the ideal and the real, throws open the doors to human art and power. He is free to dissect nature and discover potentialities that cut across the natural kinds: the heat of a flame, not being essentially different than the heat of the sun, gives human power greater scope.²⁴⁵ Nature in its ordinary course is but one possibility, and human art can vex nature until it takes on other, more beneficial shapes. Man's power is not confined to the imitation or perfection of nature, and his contemplation is not limited to nature in course. He can through his industry put a new face on the universe and bring into being, both for his use and for his contemplation, what nature ordinarily does not.

But most damning of all is the ancients' *practical* failure: they failed to make men virtuous and happy. The theoretical failings of Socratic philosophy leave unsatisfied those Socratic philosophers' contemplative desires. Their good is realized in becoming wise, not in the loving search for wisdom. Philosophy as Socrates practiced it is the best life only if wisdom is given up for impossible.

The old philosophers' doctrines also stood in the way of ordinary men's pursuits of happiness. It is hard to know whether Socrates is being ironic when he describes the great public good he tried in vain to confer on his fellow citizens, but Cicero knew at least one man who took him in great earnest: "Cato optimè sentit, sed nocet interdum reipublicæ loquitur enim tanquam in

²⁴⁵ See, for example, *NO* I §75 and 88 (*OFB* XI, 121 and 141). In the latter, Bacon blames "certain tenets" of the old philosophy that "tend wholly towards a wicked circumspection of human power and an intentional and unnatural despair."

republic: Platonis, non tanquam in fæce Romuli.”²⁴⁶ The one charge Bacon allows to stand in his defense of the manners of the learned is their readiness, “because the times they read of, are commonly better than the times they live in; and the duties taught, better than the duties practised,” to “contend sometimes too farre, to bring thinges to perfection” and take their measure from “examples of too great height.”²⁴⁷ Bacon repeats but does not accept Cicero’s attempt to excuse the philosophers’ too-lofty teachings, that they set the points of duty higher than nature could support so that, after coming inevitably short of their mark, men would in the end satisfy their true duty. In practical affairs, the ideal is worse than useless, starlight too faint to navigate by. Cicero and the rest, even when they hit upon “the true objects and scopes of mans wil and desires,” failed “to frame and subdue the will of man to become true and conformable to these pursuities.” It is not enough to describe however so accurately the nature of the good without also “prescribing rules how to subdue, apply and accomodate the will of man thereunto.”²⁴⁸ And by making the highest the measure of the lower, by using the ideal—the *ought*—to measure the real—the *is*—they gave up ordinary men up to material penury and pre-mature death. The Christian faith, too, gave up good men, and the felicity it holds out to man is only “by hope of the future world” and never, even for the virtuous man, assured.²⁴⁹ But it also showed how the good may be more generally shared. God Himself suffers his rain to fall on the just and the unjust alike, and at least some of the human goods Bacon seeks can be goods for all men, even for vicious or ignorant or apostate men. The ancients were either callously indifferent to the goods possible for most men or their practical failures point back to a fundamental misunderstanding of man, man’s good, and the means by which nature could be made to serve it.

²⁴⁶ *AL I* (OFB IV, 17). This is Bacon’s paraphrase of Cicero, *Epistle ad Atticum* II, 1.

²⁴⁷ *AL I* (OFB IV, 17).

²⁴⁸ *AL II* (OFB IV, 134-35).

²⁴⁹ See Bacon’s endorsement of Machiavelli’s view in *Essays*, “Of Goodness and Goodness of Nature.”

1.10.5 Bacon's Anti-Socratism

“*Socrates* had brought philosophy down from the heavens to the Earth . . . and turned men’s minds away from the natural,” bringing the brief period during which natural philosophy flourished to an end.²⁵⁰ Cicero, too, understood Socrates’s revolution to be a turning point in philosophy. “Up until Socrates,” he says, philosophers studied “numbers and motions,” the causes of generation and destruction, and “everything celestial.” And it was Socrates who first “called philosophy down from the heavens, billeted it in cities, and even introduced it into households, and compelled it to inquire about life, mores, and things good and bad.”²⁵¹ Bacon’s new way turns Socratic philosophy on its head. His great instauration is, broadly, a rejection of Socrates’s confused method and way of life.

The problem with Socratic philosophy is not, in itself, a turn to human things. Bacon, too, believes his new method can achieve important results in “moral and political philosophy.” He is already, he reports, compiling a “history and tables of discovery concerning anger, fear, shame and so on, and also ones to do with examples of civil business.”²⁵² The real problem is that, in the most crucial way, Socrates *failed* to bring philosophy down from the heavens. For he looks to the “heavenly” Forms, to the Beautiful, the Just, and the Good, itself by itself, to understand man. He errs in idealizing the real. Or, to put it another way, a theologized or idealized philosophy cannot be a natural philosophy. Politics and morals no less than “astronomy, optics, music, many of the mechanical arts, and medicine itself” must be “reduced to natural philosophy” if they are to progress. The moral philosophers who “spent such an infinite quantity of debate touching Good and the highest good” would have done better had they

²⁵⁰ NO I §79 (OFB XI, 125). He repeats the charge in AL I (OFB IV, 32).

²⁵¹ Cicero, *Tusculan Disputations*, V.iv.10. (As quoted in John C. McCarthy, “Bacon’s Third Sailing: The ‘Presocratic’ Origins of Modern Philosophy,” 169.)

²⁵² NO I §§80 and 127 (OFB XI, 127 and 191).

cast their eye abroad upon nature and beheld the appetite that is in all things to receive and to give; the one motion affecting preservation and the other multiplication; which appetites are most evidently seen in living creatures in the pleasure of nourishment and generation; and in man do make the aptest and most natural division of all his desires, being either of sense of pleasure or sense of power; and in the universal frame of the world are figured, the one in the beams of heaven which issue forth, and the other in the lap of the earth which takes in: and again if they had observed the motion of congruity or situation of the parts in respect of the whole, evident in so many particulars; and lastly if they had considered the motion (familiar in attraction of things) to approach to that which is higher in the same kind; when by these observations so easy and concurring in natural philosophy, they should have found out this quaternion of good, in enjoying or fruition, effecting or operation, consenting or proportion, and approach or assumption; they would have saved and abridged much of their long and wandering discourses of pleasure, virtue, duty, and religion.²⁵³

After he unnatured nature, Socrates's inquiry into "things good and bad" could be nothing but a vain and wandering discourse.

Socrates, busy discussing virtue, spurned the real and useful knowledge of his fellow citizens. If he excels anyone in wisdom, it is only because, while others falsely suppose themselves to know, he alone knows that he does not know. All the oracle meant when he ranked Socrates as the wisest of men is that human wisdom "is worth little or nothing."²⁵⁴ Wisdom beyond an awareness of one's own ignorance, Socrates concludes, would be "more than human."²⁵⁵ To reach this conclusion, Socrates consulted various men in the city, searching for someone wiser than he. He last comes to the craftsmen, knowing that "they had knowledge of many fine things," including many things that Socrates does not know. But their knowledge, like the poets', puffed them up: "each of them, because of his success at his craft, thought himself very wise in other most important pursuits." Their presumption "overshadowed the wisdom they had," and so Socrates decides that it is better to be as he is, "with neither their wisdom nor their ignorance," than to know what they know but be ignorant of his own ignorance.²⁵⁶

²⁵³ *VT* (*SEH* III, 229-230).

²⁵⁴ Plato, *Apology* 23a-b.

²⁵⁵ Plato, *Apology* 20d-e.

²⁵⁶ Plato, *Apology* 27c-e.

Ignorance usually diminishes culpability, but not, according to the stern judge Bacon, in Socrates's case. Had he been less proud of his own ignorance, Socrates might not have been so contemptuous of the servile arts. The unreflective practice of the artisans may not rank as philosophical knowledge, but it reveals a fundamental truth about nature and man's power over it. Through art, we again and again constrain nature and bend it to our profit. The surefooted progress of the arts recommend them as a pattern for how knowledge, less exalted but more real, can be acquired. They, unlike the discoursing wits haunting the agora or congregating in the Academy, have real contact with nature both as it is and as it can be made to be. While Socrates talked, those craftsmen fed and clothed the Athenians, provided them with comforts, and provisioned an army to keep them safe. That lover of wisdom passed by real knowledge in his search for a knowledge he believed to be unattainable. That patriotic friend of the city passed by real, tangible goods while exhorting men to a life of specious virtue.

Bacon's attempt to undo the Socratic turn depends on establishing a new relation between man and nature.²⁵⁷ The ancients' naïve trust in the mind's ability to take in the universe as it is in itself led them to falsify nature. Believing mind to be potentially all things, they in fact made all things take on the character of mind. They projected onto nature the good that belongs only to man

²⁵⁷ Leo Strauss discovered in Machiavelli a new idea of nature: "What Machiavelli calls the imagined commonwealths of the earlier writers is based on a specific understanding of nature which he rejects, at least implicitly. According to that understanding, all natural beings, at least all living beings, are directed towards an end, a perfection for which they long; there is a specific perfection which belongs to each specific nature; there is especially perfection of man which is determined by the nature of man as the rational and social animal. Nature supplies the standard, a standard wholly independent of man's will; this implies that nature is good. Man has a definite place within the whole, a very exalted place; one can say that man is the measure of all things or that man is the microcosm, but he occupies that place by nature; man has his place in an order which he did not originate. "Man is the measure of all things" is the very opposite of "man is the master of all things." Man has a place within the whole: man's power is limited; man cannot overcome the limitations of his nature. Our nature is enslaved in many ways (Aristotle) or we are the playthings of the gods (Plato). This limitation shows itself in particular in the ineluctable power of chance. The good life is the life according to nature, which means to stay within certain limits; virtue is essentially moderation." Bacon generalizes Machiavelli's insight. Through his science and art, man can more comprehensively master fortune than Machiavelli had supposed. Non-human nature is at least as pliable as human nature. See Leo Strauss, "Three Waves of Modernity," in *Political Philosophy: Six Essays*, ed. Hilail Gildin (Indianapolis: Pegasus/Bobbs-Merrill, 1975), 85-86.

or is of man's own making. They made man the measure of what is and nature the measure of what should be. Mistaking nature as a standard, they resigned themselves to a self-imposed impotence, counting it a virtue to bow to nature and be contented with its miserly blessings. But the artisans and craftsmen Socrates passes by show that some knowledge is possible and that nature can, at least in some degree, be mastered. Bacon's nature-mastering science reverses man's relationship to nature. Nature, not man, is not the measure of what *is*.²⁵⁸ "Man, the servant and interpreter of nature, does and understands only as much as he has observed, by fact or mental activity, concerning the order of nature," he says, "For nature is not conquered save by obeying it."²⁵⁹ But man, not nature, is the only measure of what *should be*. Perhaps it would be otherwise were we still in Paradise. Yet "the curse did not quite put creation into a state of unremitting rebellion, but by virtue of that injunction *In the sweat of thy face shalt thou eat thy bread*, it is now by various labours . . . at length and to some degree mitigated to allow man his bread or, in other words, for the use of human life."²⁶⁰ Since we live in a Fallen world, in "the dregs of Romulus," our good is in our own hands.

1.11 Bacon's Anticipations and the Idea of Nature

Bacon pejoratively labels the old logic *Anticipations of Nature* because, he claims, the ancients proceeded in their investigation of nature impetuously and prematurely.²⁶¹ Abstaining from "all unseasonable human reasoning which anticipates time by abstracting from things more recklessly and hastily than it should," Bacon promises more measured, step-wise, and experientially grounded

²⁵⁸ NO I §41 (OFB XI, 79-81).

²⁵⁹ NO I §§1 and 3 (OFB XI, 65).

²⁶⁰ NO II §52 (OFB XI, 447).

²⁶¹ NO I §26 (OFB XI, 75).

conclusions.²⁶² Because of that self-imposed limitation Bacon, unlike the ancients, has “no entire or universal theory to propound” and “cannot hope to live to complete the sixth part of the Instauration.”²⁶³ Bacon’s restraint and circumspection does not impede the progress of philosophy and the sciences because this skeptical moment is counterbalanced by a more dogmatic moment. As I will argue, Bacon’s new logic makes sense only if he makes certain assumptions about nature. The superiority of Baconian interpretation—a form of reason-guided induction and experimentation—rests on his claim that it is a better match for the subtlety of nature than were the ancients’ anticipations. Although a full knowledge of nature is available only when the new, active science is fully realized, to begin and guide that new science, Bacon must anticipate its conclusions. Perhaps nature will reveal herself otherwise than Bacon expects, but because those initial assumptions about nature will determine the questions science puts to nature and the kinds of arguments and experiences it will accept as evidence, the nature Bacon’s science discovers cannot be wholly different than the nature he anticipates. Those anticipations, those *methodological* guesses that Bacon hazards about nature, determine in important ways the conclusions of Bacon’s methodical science.

Let me make my claim about Bacon’s determinative anticipations more concrete with a few examples. Bacon affixes to his new method directives for drawing up rigorous natural histories. Natural history, he says, is threefold, dealing with nature in its ordinary course (the “*liberty* of nature”), nature frustrated (nature’s “*errors*” or aberrations), or nature constrained by human art. The history of nature in its ordinary course can be further divided into five parts: first, a history of the ether and heavenly bodies; second, a history of meteors and the airy region between the moon and the earth; third, histories of the earth and sea; fourth, a history of the elements, by which Bacon means not the “*primordia* of things” but the greater mass of natural bodies; and fifth, histories of

²⁶² *IM* Proem (*OFB* XI, 25).

²⁶³ *NO* I §116 (*OFB* XI, 175).

species and “matters with which natural history has mainly been concerned up to now.”²⁶⁴ These divisions are familiar to anyone who had read, in the *Advancement*, Bacon’s earlier schematism for natural histories.²⁶⁵ But here, in the *Paraseue ad historiam naturalem*, Bacon adds a catalogue of 130 particular histories organized according to his divisions.²⁶⁶ Graham Rees, who has done much to reconstruct Bacon’s substantive natural philosophy and trace its sources, finds in these histories a “provisional natural philosophy” that Bacon develops in “anticipation” of the active science his method of interpretation would yield. “Natural history implies an idea of nature,” he notes, “and this is how nature seemed to Bacon.” Those anticipations and the idea of nature they articulate are, Rees asserts, “woven deeply and inextricably into the texture of *Novum organum*.”²⁶⁷ Charles Whitney, considering Bacon’s reforms of the rhetorical tradition, sees these divisions of natural history as a necessary rhetorical device:

Before the collection of data for any inductive inquiry (Baconian or otherwise) can begin, there must be an initial cataloguing of subject matter according to some general notions about the right way to divide up the multiplicity of nature. . . . Without some initial assumptions about how the universe should be divided up, the posing of any question for inductive solution would have to take the whole world into account.²⁶⁸

Cataloging and dividing performs a necessary abridgment. But they are nevertheless *assumptions* which condition the inductions they make possible.

Both Rees and Whitney catch Bacon running ahead of his own method. But neither of them can explain the origin of those anticipations or appreciate just how they inform Bacon’s science. In Rees’s case, the problem is (as I argued in the introduction) his failure to distinguish between those anticipations that differ from the ancients’ blameworthy anticipations only in being affirmed

²⁶⁴ *PAH* §I (OFB XI, 455).

²⁶⁵ *AL* II (OFB IV, 63).

²⁶⁶ *PAH* (OFB XI, 475-85).

²⁶⁷ Graham Rees, Introduction to *OFB* XI, xliii-xliv.

²⁶⁸ Charles Whitney, *Francis Bacon and Modernity*, 67-68.

provisionally and those anticipations that guide and justify the new science and which, therefore, can never be certified by the method they ground.

Bacon's anticipations extend beyond his scheme of natural histories. In fact, we'll find that Bacon's most important substantive claims, and so also the most important features of his method, are methodological anticipations of nature. For example, he says that nature is far more subtle than human sense and intellect. His new science will for the first time give man the ability to pry into nature's secrets. That there are secrets and subtleties to discover is and can only be a guess since, without the help of method, neither sense nor intellect is sharp enough to perceive nature's subtlety. He asserts, without qualification or hesitation, that in nature there are only pure individuals performing their individual acts according to law. No experience, naïve or methodical, can ground that absolute claim. Yet that anticipation justifies Bacon's conviction that "to abstract from nature is not as effective as to dissect it." We should, therefore, abandon the search for formal causes and instead "focus on matter" and those sub-sensible parts and motions that Bacon calls "its schematisms and metaschematisms, and the pure law of that act or motion."²⁶⁹ That those pure acts follow some law is a further guess, as is Bacon's opinion that those laws are hierarchically ordered. Likewise, Bacon's steadfast belief that final causes have no place in natural philosophy is a presupposition of Bacon's new science, not a truth it methodically establishes. The same goes for Bacon's assertion that a body—a lump of gold, for example—is "an array or conjugation of simple natures."²⁷⁰ Antonio Perez-Ramos reminds us of Bacon's "*abecedarium Naturæ*, his list or cannon of fundamental physical properties which, by combining and recombining themselves in various modes, give rise to the manifold of sense experience," noting that "such privileged set" of simple

²⁶⁹ NO I §51 (OFB XI, 89).

²⁷⁰ NO II §5 (OFB XI, 207).

natures “does not depend on any empirical information, but appears to be posited *a priori*.”²⁷¹ John Stuart Mill faulted Bacon’s method for tacitly assuming that an effect could not have more than one cause, that, for example, there is one and only one set of conditions present in all instances of heat. Bacon’s method, that is, takes for granted that a particular *form* or *law* is both necessary and sufficient for the presence of a given nature.²⁷² But that unproven assumption underpins Bacon’s use of eliminative induction and his vast hopes for the closer joining of human knowledge and power.

Bacon’s anticipations of nature show up in another guise as the tension, often unnoticed, in Bacon’s call for a *reason-guided* empiricism. Of the many things Francis Bacon has been called, perhaps *empiricist* is the least just. To be sure, Bacon’s project aims “to lead [men] to things themselves and their interconnections”; Bacon boasts that he is engaged “purely and unceasingly with things.”²⁷³ He insists that monkish men stop spinning entire worlds out of the cells of their own wits, urging them instead to seek truth in the wider world. But he also claims to have “solemnised a true, lawful and enduring marriage between the empirical and rational faculties.”²⁷⁴ Or rather, he has reconciled the estranged couple, for the “protracted and inauspicious divorce and mutual rejection” of the two faculties has “caused so much upset in the human family.”²⁷⁵ For all the trouble caused by the mind’s proud disdain for things themselves, Bacon has no wish to abandon us to the waves of experience. Because we are so beset by the mind’s Idols, because we rush precipitously to conclusions and must otherwise drift blindly like *mere empirics*, Bacon insists that “our tracks must be guided by a clue, and a sound policy must secure every step of the way right from the very

²⁷¹ Antonio Pérez-Ramos, “Bacon’s Forms and Maker’s Knowledge,” in *Cambridge Companion to Bacon*, ed. Markku Peltonen (Cambridge: Cambridge University Press, 1996), 102-3.

²⁷² See, for example, NO II §4 (OFB XI, 205): “For the form of any nature is such that if it be in place the given nature invariably follows. Thus it is constantly present when that nature is present, and universally asserts it, and inheres in the whole of it. The same form is such that if it departs, the given nature infallibly disappears. Thus it is always absent when that nature is absent, and always withholds it, and inheres in it not at all.”

²⁷³ *IM* Preface (OFB XI, 21).

²⁷⁴ *IM* Preface (OFB XI, 21).

²⁷⁵ *IM* Preface (OFB XI, 21).

perceptions of the senses.”²⁷⁶ The mind tends to imagine a reality to its own liking, but Bacon's corrective does not leave the mind to wander aimlessly among the things of the world. His solution is a middle course, to rely on experience guided by reason. Bacon resorts to metaphors to make his point:

The empirics, in the manner of the ant, only store up and use things; the rationalists, in the manner of spiders, spin webs from their own entrails; but the bee takes the middle path: it collects its material from the flowers of the field and garden, but its special gift is to convert and digest it. The true job of philosophy is not much different, for it depends not only or mainly on the powers of the mind, nor does it take the material gathered from natural history and mechanical experiments and store it unaltered in the memory but lays it up in the intellect changed and elaborated.²⁷⁷

Neither reason nor experience alone can yield true and useful knowledge. When, in the first aphorism of *Novum organum*, Bacon names man “the servant and interpreter of nature,” he seems to clap man in nature’s leading strings. Man “does and understands only as much as he has observed, by fact or mental activity [*re vel mente*], concerning the order of nature.”²⁷⁸ But such observation is, for Bacon, rarely passive. Mind must anticipate experiences of a certain kind and then try to bring about those experiences. Man must constrain nature and vex it out of its ordinary course in order to reveal its more primitive laws, obeying nature only in taking its measure by and submitting to the outcome of those experiments.

Kant recognized this middle course as Bacon’s fundamental insight. He affixed as an epigraph, in the second edition of his *Critique of Pure Reason*, a quotation from the preface to *Instauratio magna*.²⁷⁹ In the second preface, he praises the “ingenious” Francis Bacon for occasioning or stimulating a discovery that made, at long last, natural philosophy into a rigorous science. Kant

²⁷⁶ *IM* Preface (OFB XI, 17).

²⁷⁷ *NO I* § 95 (OFB XI, 153).

²⁷⁸ *NO I* §1 (OFB XI, 65).

²⁷⁹ *IM* Preface (OFB XI, 22-24).

offers as examples famous experiments performed by Galileo, Torricelli, and Stahl, but the language he uses to explain the revolutionary turn echoes Bacon. These great experimenters

learned that reason has insight only into that which it produces after a plan of its own, and that it must not allow itself to be kept, as it were, in nature's leading-strings, but must itself show the way with principles of judgment based upon fixed laws, constraining nature to give answers to questions of reason's own determining. Accidental observations, made in obedience to no previously thought-out plan, can never be made to yield a necessary law, which alone reason is concerned to discover. Reason, holding in one hand its principles, according to which alone concordant appearances can be admitted as equivalent to laws, and in the other hand the experiment which it has devised in conformity with these principles, must approach nature in order to be taught by it. It must not, however, do so in the character of a pupil who listens to everything that the teacher chooses to say, but of an appointed judge who compels the witnesses to answer questions which he has himself formulated. Even physics, therefore, owes the beneficent revolution in its point of view entirely to the happy thought, that while reason must seek in nature, not fictitiously ascribe to it, whatever as not being knowable through reason's own resources has to be learnt, if learned at all, only from nature, it must adopt as its guide, in so seeking, that which it has itself put into nature.²⁸⁰

No one, Kant included, believes that Bacon had in mind Kant's transcendental idealism. Bacon is not a proto-Kantian. But Kant surely is, in crucial ways, a latter-day Baconian. Before Kant woke from his dogmatic slumber and began work on his critical philosophy, Bacon had already unearthed the mind's Idols. Both Bacon and Kant make their critique not, like the skeptics, to undermine reason, but to prop it up. Each in his way limits reason's theoretical ambitions to give greater scope to its practical employment. And like Kant, Bacon understood the problem of knowledge to be, at bottom, about how to reconcile reason and experience.

The comparison between Kant and Bacon suggests a loose but helpful way of understanding Bacon's method and its roots in Bacon's pre-methodical anticipations of nature. We can think of Bacon's method as a new regulative idea of nature made active or operational. Bacon's anticipations of nature do not have the same standing as the methodically certified conclusions of the completed

²⁸⁰ Immanuel Kant, *Critique of Pure Reason*, trans. Norman Kemp Smith (New York: St. Martin's Press, 1965), B xiii-xiv.

science will. But the difference is not that the anticipations are provisional and the interpretations vouchsafed and permanent. Instead, the anticipations are meant to guide or regulate the mind's search for nature's laws. The failure of the ancients' science led the ancients to falsify nature, not superficially or in part, but at bottom and on the whole. But if we shift our perspective, we can say instead that the ancients' false idea of nature mislead them in their investigations. We cannot uncouple the science of nature from the concept of nature that directs and justifies it. And if we are finding fault, we can finger either with equal justice. So we should expect alongside Bacon's new science a new understanding of the subject of science. The nature the ancients anticipated, that is, is not the same nature that Bacon interprets, an equivocation Bacon obscures. The necessary correlate to Bacon's new science is a new understanding of nature. That new understanding is not the result of his method but instead the regulative idea that justifies and gives shape to his method.

Chapter 2

The Cave of Ordinary Experience

I argued in the first chapter that Bacon's new idea of nature takes shape *dialectically*, in his critique of the old or common logic. Here I will try to clarify the new sense of *experience*—a methodically constructed substitute for the “direct” experience of things themselves—that comes out of Bacon's critique of ancient philosophy's starting point.

Bacon announces at the beginning of the *Instauratio magna* the root cause of our troubles. He “knew for a fact” that man's ignorance and “countless disadvantages” could be traced back to the gap between Mind and Things.¹ Ordinary experience of nature in its ordinary course—the familiar experience that is, by all accounts, first for us and the starting point of Platonic and Aristotelian science—is the cave from which Bacon's new natural philosopher must somehow escape. To restore the commerce between Mind and Things, discover laws that nature would recognize as her own, and “let the mind exert its proper authority over the nature of things,” Bacon upends the attitude of basic trust so characteristic of the Socratic approach to experience. He vows to “dig deeper and firmer foundations for the sciences, and push back the beginnings of the inquiry further than people have done so far, subjecting things to inspection which the common logic takes on unreasonable trust,” to ground axioms on experience and particulars “in a proper and systematic way,” and thus to ascend to generalities that “really are better known to nature.”²

The phrase *better known to nature* is an unmistakable allusion to Aristotle. Yet Bacon does not say (as Aristotle had, and as we would therefore expect Bacon to say in this context) that inquiry

¹ *IM* (OFB XI, 3).

² *DO* (OFB XI, 33) and *NO I* §22 (OFB XI, 73).

begins with what is first and most familiar to us. Ordinary experience, “undisciplined and ungrounded,” is a poor foundation for philosophy. It needs, on Bacon’s telling, to be “marshalled and well-grounded,” to be “corrected” or prepared through some kind of “reduction.”³ We may begin to suspect that the “sense and particulars” that serve as the starting point for the old philosophy are not the same “sense and particulars” from which Bacon’s new method begins, that Bacon means by *experience* something fundamentally different, more complicated, and stranger than is usually supposed. Indeed, I will argue that Bacon’s critique of the ancient starting points is a disagreement about how to employ experience in the study of nature, but also and more importantly a disagreement about the very nature of experience. The new science will have to begin with a more circumspect, more *methodical*, and more *active* experience that puts the question to nature rather than waiting on nature’s revelation.

Ancient natural philosophy begins with “ordinary” experience. So Bacon’s critique of ancient starting points is at once a reproof of our trust in ordinary experience and the Platonic-Aristotelian dialectical science built upon that experience. The pre-theoretical mind—and the mind disciplined by dialectic—is a distorting, anthropomorphizing mirror that falsifies the world by making man its measure and mixing its own nature with things instead of reflecting them faithfully. The world as we see it is not the world as it truly is. Perception is “built to the scale of man and not the universe.”⁴ Error creeps in from the very beginning through the mind’s confused and reckless abstraction of notions. Those unsound notions, codified and legitimized in language, articulate for us the world in which we typically think and act. Philosophical dialectic employs these false notions and misleading

³ *NO I* §82 (*OFB XI*, 129) and *NO Preface* (*OFB XI*, 53). Cf. Spedding’s translation at *SEH IV*, 40.

⁴ *NO I* §41 (*OFB XI*, 81).

words as its starting points. Socrates's turn from things themselves to speeches about those things only perpetuates and compounds errors that his dialectic is helpless to correct.

The divorce between Mind and Things is not, however, all our fault. Nature also hides. Even the best opinions, because they are based on a counterfeited or too-narrow experience of the world, lead us astray. If the mind were a truer, better-polished mirror, still our experience of nature is neither wide nor subtle enough to know nature as it truly is. For the most part we see but one face of nature—what Bacon calls nature “free” and in its “ordinary course.”⁵ Nature free and in its ordinary course is just that familiar world in which we all live, populated, we think, by beings of different kinds. But nature can take on different shapes or wear different masks; the world we experience is not the only possible world. Because it is more subtle than our senses, nature itself, or whatever lies behind or beneath nature's various masks, is inaccessible to our senses. We are usually unaware of our own provincialism: we inveterately and unconsciously mistake the world we usually experience—our world—for the world simply.

But we have also blinded ourselves by discounting and discarding experiences that do not fit our idea of nature. Nature from time to time deviates from its ordinary course and brings forth what we call *monsters*. Aristotle taught us that nature is that which happens always or for the most part. So monsters, aberrations and “irregularities,” instead of broadening our understanding of nature, are dismissed as scientifically unimportant instances of nature frustrated. Or, when nature confounds our expectations, we crowd the new and potentially disruptive experience into our well-worn but inadequate categories or make a logical distinction. Man himself brings into being a new theater of things through his art. But Aristotle drew a sharp line between art and nature, allowing that the former could complete and perfect the latter, but denying that man's creations could reveal

⁵ See, for example, *PAH* §1 (*OFB* XI, 455).

something new about nature. Aristotle's distinctions between nature, monsters, and art explained away those deviations from the ordinary course of nature that show our ordinary experience and old notion of nature to be only partial.

So while knowledge of nature must begin with experience of nature, our ordinary experience of nature in its ordinary course cannot adequately ground our science. Bacon's new method, then, aims to find a more adequate starting point. True induction based on natural histories, both informed by experiments that artfully expand and refine our experience of the world, serve better as philosophical starting points. Or, to use Bacon's own images, these copious and well-digested histories will lay surer foundations for philosophy, will be, as it were, the milk on which an active philosophy is nursed. In a special sense, then, these histories and experiments—experience made *literate*—take the place of those *endoxa* by which philosophers once took their bearings. They form a new but artificial experiential basis for thought. And, I will argue, it is Bacon's new idea of nature, achieved in his prudential critique of the old idea of nature, that shapes that new mode of experience.

The question, then, is how Bacon reconceives experience to make it a suitable starting point for the true discovery and mastery of nature. I begin by framing the problem of experience as we meet it in Bacon's *Instauration*. To really understand the transformation of experience Bacon brings about, we must distinguish it from the set of problems raised by other early-modern philosophers. The real foil to Bacon's artificial experience is the “natural” or ordinary experience the ancients appealed to. So I spend some time describing the ancients' trust and Bacon's mistrust of ordinary experience. These reflections on Bacon's mistrust of ordinary experience help fill out the account I've been developing of Bacon's method and his idea of nature. They allow us to see his method as a middle ground between dogmatism and skepticism—what I characterize as dogmatic skepticism or

skeptical dogmatism—and his idea of nature as the set of *legitimate* anticipations shaped by his dialectical rejection of the Socratic-Aristotelian idea of nature.

In the second half of the chapter, I turn to Bacon's reconstitution of experience. Our ordinary experience of nature in its ordinary course is a kind of cave from which we must escape.⁶ We need helps and aids if we are to overcome the mind's Idols and the hiddenness of nature that condemn us to begin in that cave. I show how Bacon's new natural history, the set of experience-generating strategies he calls *experientia literata*, and reason-guided experiments create a new, artificial or methodical experiential basis for science. In each case, Bacon's anticipations of nature guide the collection and organization of experience. Working backward from his prescriptions for a new natural history and his description of the role of experiments, then, we can get a fuller sense of Bacon's idea of nature and the marriage of reason and experience he hopes to bring about.

In the chapter's final section, I briefly consider the relation between "ordinary" experience and the artificial experience on which Bacon's science depends. Bacon's methodical starting point cannot in any simple way break free from either our pre-theoretical experience of the world or earlier philosophical articulations of nature. His histories, for example, set out from the natural-kind articulation familiar to us from our ordinary experience and have as their principal subject matter those beings in their respective kinds. Bacon's return to "things themselves" is mediated and so shaped by the ordinary experience he so thoroughly undermines and the old philosophies whose principles and modes of demonstration he finds so wanting.

⁶ See Richard Kennington, "Bacon's Ontology," 45-46: "The ordinary course of nature is to Bacon's philosophy what the cave is to Plato's. This fact is obscured for us, because we usually regard another doctrine, the famous *Idola*, the Idols of the mind, as standing to Bacon's philosophy as the cave to Plato's. But the entire doctrine of *Idola* falls within the topic 'anticipations of nature,' and the anticipations are a function of our place within the ordinary course of nature, that is, a natural fact. So that while the *Idola* are differentiated by being either native (or innate) or adventitious, all have our natural condition as their basis." Cf. Richard Kennington, "Bacon's Reform of Nature," 11.

2.1 The Peculiarity of Bacon's Empiricism

To avoid a shallow interpretation of the problem of experience, I need first to return to a claim I made in the previous chapter. There I said that, of all the things Bacon has been called, perhaps *empiricist* is the least just.⁷ That label has proved particularly sticky, the cause of both his apologists' praise and his critics' scorn. Even if, as his critics claim, he was no scientist himself and fundamentally misunderstood the way science works, still he successfully championed experiential and experimental science. His vigorous rhetoric helped sweep out old, bookish learning and goaded men to open their eyes, dirty their hands, and give up their proud and precious disdain for the low and ordinary things of nature. In place of the ancients' airy speculations and the Schoolmen's tiresome logical disputations, Bacon urged students of nature to close their books, quit their cells, and return to the study of things themselves.

Bacon himself concedes that our speculative and practical fortunes may depend more on the compilation of natural histories than his new organon. The new method can guide the mind and keep it from error, "but it cannot supply and furnish the matter for knowledge" and "there is no substitute or alternative to this hard labour" of collecting experience. It "has to be done or the whole business be given up."⁸ By contrast, Bacon claims for his art of interpreting nature "no perfection or absolute necessity . . . (as if nothing could be achieved without it)." A history of nature would suffice if men would only restrain themselves from hasty generalizations and treat received knowledge with a healthy suspicion.⁹ A return to experience and things themselves is the one thing

⁷ See above, p. 144.

⁸ *DO* (OFB XI, 37).

⁹ *NO I* §130 (OFB XI, 197).

needful, the real crux of Bacon's program, and, so it seems, the way in which he most usefully influenced modern science.¹⁰

Bacon's winning rhetoric tempts us to juxtapose a singularly un-empirical, "logicized," or "theologized" philosophy to his own science uniquely built on the unmediated experience of things themselves. To avoid being taken in by his self-presentation, we should remember that almost no one before Bacon doubted that knowledge of human nature or non-human nature rested on experience. Men had first to observe the motions of the heavenly bodies before Ptolemy's eccentric epicycles could save the phenomena. Physicians, no matter how unskilled, saw how their tinctures, tonics, and balms, their regimens and surgeries, healed or harmed their patients.¹¹ The alchemist bent over his crucible was accumulating experience even if he was too ready to explain away his inert compounds and untransmuted metals. Plato's Socrates, too, depends at every step on the experience of his interlocutor. His Forms attempt to account for our common experience of similarity and difference and the recurrence of qualities in separate beings. Even in his most dialectical moments, Aristotle relies on experience. Those authoritative opinions that orient his thinking have their origin in experience. He recognized that young and inexperienced men were unfit to study politics.¹² They lack the prudence—a virtue that requires experience and so also time—necessary to discern the good and judge what actions are best suited to achieve it. He also said that we learn those things we

¹⁰ Lisa Jardine argues that Bacon's *Novum organum* served as "the figurehead for two separate intellectual movements," a thorough-going empirical science comprised largely of natural histories and a systematic science that aimed at certain knowledge of indemonstrable first principles. Those who read him as a systematic rationalist found him wanting while those who read him as an empiricist gladly claimed him as the movement's founder. See Lisa Jardine, "Experientia literata or *Novum Organum*?" in *Francis Bacon's Legacy of Texts: The Art of Discovery Grows with Discovery*, ed. William A. Sessions, (New York: AMS Press, 1990), 47-67.

¹¹ See *DAS* IV.2 (*SEH* IV, 380-81 and 384-85). The physician's art is especially hard to judge because the human body is so variable that one cannot always tell what is due to art and what is due to accident. Quacks can seem as qualified as skilled doctors. Bacon in particular recommends Hippocrates's practice of recording narratives that comprehended the special case of the patient, the nature of the disease, the particulars of the treatment, and the outcome.

¹² *Nicomachean Ethics* I.3.

do by doing them.¹³ There is no shortcut to acquiring the experience on which prudence and art depend.

Bacon himself begrudgingly acknowledges Aristotle's experimental or observational scientific work.¹⁴ Aristotle's "treatises on physics, astronomy, meteorology, biology, and psychology," Lorraine Daston notes, "overflow with careful observations on everything from sleeping to eclipses to the embryological development of chicks."¹⁵ "Aristotle's methodological writings contain many passages which are just as insistent upon the need for close observation as the writings of Francis Bacon," Thomas Kuhn argues. The seventeenth-century rhetoric that located the novelty of experimental science in "the very idea of basing science upon information acquired through sense," a revolution only possible once men had "escape[d] [Aristotle's] authority sufficiently to study nature rather than books," he adds, is "absurd."¹⁶ So it has never been simply true that men have sought a knowledge of nature independent of their experience of nature. We mistake Bacon's critique if we juxtapose to his new, experiential science an old, non-experiential science.

We would also risk seriously mischaracterizing Bacon's account of experience if we were to make it answer questions asked only by later philosophers. Bacon is not troubled, like some of the modern philosophers who succeeded him, by questions about how the "external" world is available to us or how we cobble together the richness of our ordinary experience from bare sense data. He does not share Descartes's worry about the radical dualism of *res extensa* and *res cogitans*. Neither does he feel the need to trace out, as Hobbes does, the mechanisms by which the things of the external

¹³ *Nicomachean Ethics* II.1.

¹⁴ See, for example, *NO* I §98 (*OFB* XI, 157) and *AL* I (*OFB* IV, 26-27). Cf. *NO* I §§54 and 63. Both his way and the ancient way begin, he concedes, with "the sense and particulars." See *NO* I §§19 and 22 (*OFB* XI, 71 and 73).

¹⁵ Daston, "Baconian Facts, Academic Civility and the Prehistory of Objectivity," 340.

¹⁶ Thomas Kuhn, "Mathematical vs. Experimental Traditions in the Development of Physical Science," 10.

world impinge on our sense organs and make their way through a series of levers and strings to our brains or distinguish, as Locke does, between primary and secondary qualities. He has no theory of perception to offer. The problem of experience, as he understands it, could therefore not be the sort of problem such a theory would solve.

To understand what Bacon means by *experience*, we should begin instead by trying to square his call to return to things themselves with his claim that the human mind is incapable of faithfully reflecting the world. The yawning gap that he is sure exists between Mind and Things complicates (to put it mildly) his attempt to ground all knowledge of nature in experience. The sense, to be sure, is “weak and wandering,”¹⁷ but Bacon is not merely rehearsing the old complaint about the unreliability of the senses. Instruments can strengthen and focus the sense somewhat, but it is nature’s hiddenness and our own mental Idols that more fundamentally narrow and distort our experience. We are tricked, or we trick ourselves, into believing that the world is as we see it. The remedy, therefore, is a properly disciplined reason, a method that will marry the empirical and rational faculties, that will empower reason to contrive the sort of experiences that will answer the questions it puts to nature, but also oblige reason to submit to experience’s report.

2.2 Dialectic’s Trust in Ordinary Experience

We will be in a better position to see Bacon’s own starting points and his transformation of experience if we first call to mind the nature of the ancients’ starting point in ordinary experience.

The Book of *Genesis* speaks about ultimate beginnings from the perspective of what is first and better known to us as men. “The account, though comprehensive,” Leon Kass emphasizes,

¹⁷ NO I §50 (OFB XI, 87).

has an earth-centered focus. . . . [I]t address us, as terrestrial beings and as seeing beings, looking around and about and, especially, up. It begins with what we recognize and trust: the visible world we see above and about us. It shows us the articulated world of our native experience, as it manifests itself to sight. All the beings mentioned are known to us in ordinary experience: There are no mythical beasts and no gods and goddesses. The main regions of our world are present—land, sea, and air—with their appropriate inhabitants, divided into recognizable kinds or species. . . . By addressing human beings exactly as they experience the world, especially through sight, Genesis begins with what is both familiar and first for us, and for all mankind at all time.¹⁸

For both Plato's Socrates and Aristotle, philosophy begins with what we usually mean when we talk about *experience*. We start where we already are, engaged in a world populated by different kinds of beings. Despite their profound differences, Socratic philosophy and biblical faith share this common starting point in man's ordinary or "natural" way of experiencing the world. Ordinary experience discloses the "facts" about the world with which any thoughtful person has to reckon.

Aristotle counsels, at the beginning of his *Physics*, that inquiry should start from the things that are more familiar and clearer to us and advance toward those things which are clearer and more knowable by nature. We have no immediate access to what is most intelligible in itself and without qualification. Instead, we must begin with those beings that are "jumbled together"—the wholes known through perceptions. From these wholes we can separate out the elements, principles, and parts that compose them. In this way, we proceed from the familiar wholes of our ordinary experience to their simpler constituent parts, the elements and principles we reach only through thought. Starting from ordinary experience, we should try, through analysis, to reach the first or most basic elements and principles. We can take this brief description as Aristotle's own understanding of his working procedure or "method," especially its starting point.

Aristotle's account points back to his teachers'. Plato's Socrates, in his description of his own "method," suggests that we have better access to those jumbled wholes through what we say about

¹⁸ Leon Kass, *The Beginning of Wisdom: Reading Genesis*, 29-30.

them. Afraid that, like a man who looked directly at the sun during an eclipse, he would be blinded if he tried to apprehend the beings directly with his senses, he takes refuge in speeches about those beings. But words do not “image” beings in the way that water reflects an eclipsed sun, or at least words do not image beings any more than the “facts of daily life.”¹⁹ Language grasps being no less directly than the senses and may reveal being more adequately than the senses. Socrates’s starting point demands trust in the availability of being to speech and the adequacy of speech to being, in the ability of rationally articulated speech to make the rationally articulated world of beings present and intelligible.

Our opinions, of course, can be false; speech can fail to reveal the world as it is. Language has also a way of covering over being. At the beginning of *Republic* 7, Socrates asks Glaucon to picture men, legs and necks bound fast from birth, in an underground cave. Behind them is a partition above which other men parade statues and artifacts. Firelight casts shadows of those statues and artifacts onto the wall, and the cave’s prisoners mistakenly take these shadows as the most real beings. These strange prisoners are like us, Socrates says. We, too, have been born unknowingly into a cave. We spend our days talking about shadows and predicting their sequence, unaware that they are dim images of artifacts that are themselves images of what truly is. Most men live most of their lives in the murky realm of opinion. They talk and talk, but their speech fails to reveal the shadowy and incomplete character of their experience.

Aristotle, too, recognized that we cannot help but begin in the twilight world of opinions about the jumbled wholes of our ordinary experience. What is better known by nature is at first too bright for our owly eyes. We must start in the dark with the dim and shadowy beings that do not overwhelm or dazzle our sight.

¹⁹ Plato, *Phaedo* 99d-100a.

But escape from the cave is possible. *Dialogical* examinations of those opinions—the kind exemplified by the *Republic*—can correct what is false and disclose what is covered over. Purged and refined by dialectic, speech reveals the truth of beings. This trust in *logos* warrants Socrates’s “method” of testing the opinions of his interlocutors. That same trust permits Aristotle to build up a whole metaphysics, and so also a physics, from a careful study of the way we join subjects and predicates in speech. Nature and being come to light best in our search for the words that best fit them. The turn to language is not a betrayal of experience, but a considered effort to get experience right. And because our opinions, articulated in language, already take hold of the world of complex beings and states of affairs, we do not have to find some simple and unimpeachable foundation.

That escape from the cave is possible because “education is not what the professions of certain men assert it to be.” It is not “putting sight into blind eyes,” for “this power is in the soul of each.” Instead, “the instrument with which each learns . . . must be turned around from that which is *coming into being* together with the whole soul until it is able to endure looking at that which *is* and the brightest part of that which *is*.”²⁰ Though we start in the dark, we can work toward the light.²¹ The turn toward philosophy Socrates brings about in Glaucon’s soul is a possibility for man as man. Men by nature may be born prisoners in the cave, but by nature men—some men, if not all men—can escape it.

Just here Bacon fundamentally misinterprets ancient dialectic. “Those who have assigned the highest functions to dialectic,” he says, “believing that it furnished the most trustworthy aid to the sciences, have seen all too truly and well that the human intellect left to itself rightly deserves to be

²⁰ Plato, *Republic* VII, 518b-c.

²¹ Aristotle, *Metaphysics* VII.3, 1029a34-1029b12.

treated with suspicion.”²² Bacon knows perfectly well that Socrates and Aristotle did not share his suspicion of ordinary experience. His chief complaint is that they were too trusting. The misinterpretation serves a rhetorical purpose. It makes his own project more understandable, lends it credence, and manages to turn the ancients against themselves. Plato and Aristotle did just what Bacon is doing—“looking for props for the intellect,” and for just the same reason, because they mistrust “the mind’s inborn and spontaneous movements.”²³ As a draftsman uses a compass or a straightedge to steady his hand, the student of nature uses dialectic to steady and direct his mind. Dialectic is a tool, but a poor one. So Bacon is only doing what the ancients tried and failed to do. Aristotle’s old organon must give way to his new and more adequate organon.

But dialectic as practiced by Plato’s Socrates and Aristotle is in no sense a tool nor a restraint on a wayward mind. Rather, dialectic is the mode of reasoning natural to a mind fundamentally open to and receptive of being. It is not a straightedge or a compass, but a pointing finger directing the mind’s attention to its proper object. Neither is language a tool, a set of signs, or a mere image of reality. It is more like a transparent medium or, as Socrates suggests, the very way the world shows up to us. Language itself and what has been said about beings provide a *logical* and *dialogical* access to nature that is not the same as, but is also not wholly distinct from, direct, perceptual experience. Our speech merely articulates and makes newly available to reason what we experience. Our speech also reveals the problems that call us to thought. Our habit of using the same word to cover a variety of particulars suggested to Socrates the set of problems he tried to solve by way of his Ideas. But it was also language in which he sought refuge from being’s dazzling brightness. Our everyday way of talking, he decides, is a more trustworthy guide to truth than the materialist’s speculations about

²² *IM* Preface (*OFB* XI, 19).

²³ *NO* Preface (*OFB* XI, 53).

material and efficient causes. And it is language that brings those principles of being and knowledge to light. To be sure, Aristotle's more formal logic makes dialectic and language look more tool-like. A special discipline may be necessary to use speech apophantically, but speech is always, without any special effort on our part, revealing being. That is why Aristotle can use the grammar of our language to map the "grammar" of being. Even the syllogism rests finally on the ability of being to "speak" to us. The *logos* of thought, of speech, and of being is the same *logos*, but "it is in speech, in search for and finding adequate words," Jacob Klein noted, "that the *logos* of things, the *logos* of nature becomes audible and capable of being understood."²⁴

Bacon's misinterpretation of ancient dialectic silences what is probably the most important argument against his new method, that the mind's special openness to being requires no method. It also obscures the fact that Bacon's new science is related to ordinary experience in a fundamentally different way than Socratic philosophy is. His new method does not attempt, as Socratic philosophy does, to understand the way the world shows up to the non-philosopher. It refuses to begin with or be anchored by ordinary experience.

We will want to keep these Socratic starting points in mind. For now, it is enough to emphasize that Plato's Socrates and Aristotle begin where we all must, by trusting our ordinary experience of the everyday world. Socrates's Forms and Aristotle's prime matter are, to be sure, recondite conclusions, but they have their beginnings in experiences that are recognizable even to the philosophically uninitiated. Socrates talks about cobblers and anglers; he asks how a good man can raise good sons and how the simple needs of human beings grow into just or unjust communities. Aristotle contemplates animals and their parts, plants growing from seeds, stones falling, arrows flying, and politics enforcing their rules through punishment and shame. "Indeed,"

²⁴ Jacob Klein, "Aristotle, an Introduction," in *Lectures and Essay*, 179.

Daston says, “no natural philosophy before or since has been so deeply and broadly grounded in everyday lived experience, and it is at least arguable that Aristotle’s system is still the best overall account of our own daily experience.”²⁵ Their world, that is, is recognizably *our* world, full of familiar objects and workaday concerns. Having grown from those familiar experiences, their conclusions can speak meaningfully to our nearest concerns. Even if we struggle to follow the argument from the farmer’s need of the cobbler’s shoes to the Good Itself as the principle of being and knowledge, we never once suspect that Socrates’s philosophizing has come altogether unmoored from Glaucon’s desire for a defense of the just man. And that was just Socrates’s point in the *Phaedo*: the study of nature pursued in the absence of this humanly-meaningful perspective makes us forget what we all already know and lose sight of the true causes of our action.

2.3 Bacon’s Mistrust of Ordinary Experience

Trusting that mind can grasp nature, Socratic philosophy begins with ordinary experience, especially as it shows up in ordinary speech. Now that I have described the relation between mind and nature supposed by that trust, I can better bring out Bacon’s account of the gap between mind and nature supposed by his new method.

Bacon blames the mind for its estrangement from nature. Unlike Aristotle, who taught that the mind just is a radical receptivity to being and nothing definite before being in-formed, Bacon depicts the mind as an “uneven mirror” that “mingles its own nature with the nature of things,” an “enchanted glasse, full of superstition and Imposture, if it bee not deliuered and reduced.”²⁶ Idols

²⁵ Daston, “Baconian Facts, Academic Civility and the Prehistory of Objectivity,” 340-41.

²⁶ *NO* I §41 (*OFB* XI, 81) and *AL* II (*OFB* IV, 116). See also *DO* (*OFB* XI, 35).

both inveterate and adventitious garrison the pathway from the sense to the intellect. The fault is not all ours, though. Nature hides. It is “like a labyrinth,” full of “blind alleys, such deceptions and misleading signs and such oblique and intricate convolutions and knots.”²⁷ The mind’s “evenness” is no match for nature’s subtlety.²⁸ And without some special effort on our part, nature shows us only some few of its many latent possibilities. So we fail to see the world for what it truly is, and the world, rutted in its ordinary course, conceals its innermost character. Method is needful just because the mind, left to itself, is too gross and clumsy to coax nature into the open.

Since both mind and nature are at fault, we should look at the gap between them from both sides. I will first take up Bacon’s teaching about the mind’s Idols before turning to his teaching about the hiddenness of nature.

2.3.1 *Man is Not the Measure: The Idols*

Bacon gives the name *Idols* to those habits and deficiencies that “obstruct” the mind.²⁹ The most deeply rooted, those he calls *Idols of the Tribe*, are common to man as man. Under this single heading, Bacon groups two basic types of error. First is the human intellect’s *willfulness*. We want to find a regular, orderly, and comprehensible world—a world fit for our purposes, predictable, and knowable. The mind itself “cannot stay still or rest” but “aspires,” “compulsively hankers,” and “lusts” for knowledge it cannot have.³⁰ When nature frustrates those desires, the human intellect “counterfeits parallels, correspondences and relatives which do not exist” and, failing to discover true first causes, “falls back on something closer to, namely final causes which obviously come from

²⁷ *IM* Preface (*OFB* XI, 19).

²⁸ *NO* I §52 (*OFB* XI, 89).

²⁹ *NO* I §38 (*OFB* XI, 79).

³⁰ *NO* I §48 (*OFB* XI, 85-87).

the nature of man rather than the nature of the universe.”³¹ The mind, in short, “is not a dry light but is contaminated by the will and affections” and “man would rather believe what he wishes to be true.” Ours are “As-you-like-it Sciences.”³²

A second type of error results from the intellect’s dullness. Were the mind more steadfast and less willful, it would still be no match for nature’s roiling multiplicity. There is just too much to take in, experiences too “remote,” “heterogeneous,” and “fleeting” for us to hold together without misprision, a chaotic throng that the mind cannot reduce to order without some violence. Since nature itself does not unambiguously guide our efforts to properly weigh and organize experience, the mind imposes its own nature. Nature will not hold still, so we fix it in abstractions. Left to itself, the mind “is swayed most by those things that can strike and enter the mind suddenly and in one go,” neglecting “the remote and heterogeneous instances”; it is “moved and excited by affirmatives more than negatives.”³³ Appeals to ordinary experience only reinforce these errant habits.

Ordinary experience is authoritative only if man is the measure of what is. When Bacon says that “the greatest hindrance and distortion of the human intellect stems from the dullness, inadequacy and unreliability of the senses,” he means that, because nature’s true articulations cannot be seen, we mistakenly take our bearings from the articulations evident in ordinary experience.³⁴ The world as we naturally experience it is made up of beings that we take to be *wholes* of different *kinds*. Experience prompts us to look for a principle or principles to explain their wholeness and to treat as definitive the similarities and differences evident to sense. Because our senses are too gross to take in nature’s minuscule parts and motions, our inquiry, Bacon complains, “almost stops where sight

³¹ NO I §§45 and 47 (OFB XI, 83 and 87). On our need to find a world fit for our purposes, also consider the example of the unmemorialized sailors who perished after making solemn prayers, NO I §46 (OFB XI, 83-85).

³² NO I §49 (OFB XI, 87).

³³ NO I §§46 and 47 (OFB XI, 85-87).

³⁴ NO I §50 (OFB XI, 87).

does, and so things invisible attract little or no attention.”³⁵ Guided by the looks of things, we mistake nature. What we call *alteration*, for example, is “really only local motion *per minima*,” and anything more tenuous than ordinary air is “practically unknown.”³⁶ We pick up nature’s trail only at the point when its effects are big enough to strike our senses. “The testimony of the information and the sense” is thus “made to the measure of man and not the universe,” but “it is a very great mistake to say that the sense is the measure of things.”³⁷ Our experience is of the world only as it looks to us, but not as it is in itself: *ex analogia hominis* and not *ex analogia universi*.³⁸

2.3.2 The Hiddenness of Nature

Knowledge would be easier and more assured, even for an Idol-ridden mind, if nature were differently constituted. The mind is ill suited to know nature, but neither is nature itself readily knowable. The “roots of things,” Bacon says, “are buried deep.”³⁹

Nature hides in two basic ways. The first I will call nature’s *subtlety*. Bacon complains, we have already seen, that the senses are too dull, even when functioning well, to take in nature’s more minuscule parts. “There are,” Bacon reports, “many things which escape the sense even when it is properly managed and not obstructed at all, because of the subtlety of nature.”⁴⁰ But the examples he offers—“the minuteness of [a thing’s] parts, or its distance from us, or of its swiftness or slowness, or the object’s familiarity, or other causes besides”—are not all obvious examples of

³⁵ NO I §50 (OFB XI, 87).

³⁶ NO I §50 (OFB XI, 87).

³⁷ DO (OFB XI, 33).

³⁸ NO I §41 (OFB XI, 80-81).

³⁹ CV (F, 93).

⁴⁰ DO (OFB XI, 33).

nature's subtlety.⁴¹ Minute or swift-moving particles are comparatively straight forward instances of *subtlety*. An object's familiarity to or distance from an observer, however, are hardly the fault of nature's subtlety.

The real problem, in part, is man's *mediocrity*. In terms of size, man occupies a middle position. He is bigger, and in some cases much bigger, than other beings. He is smaller, and in some cases much smaller, than other beings. The microscope showed, in Bacon's own day, just how much escaped man's unaided sight, and his imagination could almost indefinitely extend the minuteness of the minute. Perhaps, for example, fleas host fleas of their own, and maybe those fleas, too, are plagued by yet-smaller fleas.⁴² And even those convinced that the universe is firmly bounded by crystalline spheres had always to concede that the finite cosmos was nevertheless practically unfathomable. Man likewise occupies some middle point on the time scale. A man can live long enough to witness, for example, the birth and death of many generations of fruit flies or mice, but not long enough to compass a single generation of longer-lived species let alone changes on a cosmic, geological, or evolutionary scale.

Man is also *situated*. Whether at the center of the universe or the arm of some spiral galaxy at the universe's periphery, the earth's situation makes it more proximate to some things and more remote to others, and the more remote a thing is, the harder it will be to perceive. Within limits, we can alter our situation. We can walk across the street to get a closer look or sail halfway around the globe to see some thing for ourselves. But wherever we plant our feet, the beings around us become

⁴¹ DO (OFB XI, 33).

⁴² See David Wooton, *The Invention of Science: A New History of the Scientific Revolution* (New York: Harper Perennial, 2016), 238-241. Wooton reproduces Hooke's drawing of a flea from his *Micrographia* and quotes Jonathan Swift's quip, in his *On Poetry*:

So, Nat'ralists observe, a Flea
Hath smaller Fleas that on him prey,
And these have smaller Fleas to bite 'em;
And so proceed *ad infinitum*.

familiar and so, in a sense, invisible. We fail to see what is right in front of our face or right under our nose just because it is always and unobtrusively there. Because man is situated in a web of familiar relations, nature “hides” in plain sight.⁴³

Leave aside Bacon’s claim that the mind is a distorting mirror and suppose, for a moment, that Aristotle was right, that the mind is perfectly receptive, that the mind is, in a sense, all things. Bacon’s point about nature’s subtlety is that some things, because of their size, speed, remoteness, or familiarity, can never, without special aids, strike the mind and be impressed upon it. What we experience is not the world simply, but the world that exists at our scale, in our neighborhood, and then only those parts that interest or impinge upon us. This parochialism is the pervasive and “natural” anthropomorphism polluting all our attempts to know the world. Again and again we understand the whole in terms of one of its parts and mistake the world *ex analogia hominis* for the world *ex analogia universi*.⁴⁴

The second way in which nature “hides” is a fact of nature itself and not the result of a lack of fit between mind and world. “Nature exists,” Bacon says,

in a triple condition and is subject, as it were, to three kinds of government. For it is either free and unfolds itself in its ordinary course; or it is torn from its course by the crookedness and arrogance of matter and by the violence of impediments; or it is retrained and moulded by art and human agency.⁴⁵

⁴³ See NO I §119 (OFB XI, 179): Men “make no inquiry into the causes of frequent events but take them as read and for granted. . . . taking these things as plain and straightforward, dispute and pass judgement about other things which do not crop up so commonly and constantly. But because I know well enough that no judgement can be formed about rare or notable things, and much less that new things can see the light of day without proper examination and discovery of the causes of everyday things and the causes of those causes, I am of necessity forced to take into my history things which are very commonplace indeed. . . . so we need information less often about things which are not known than attention to things which are.”

⁴⁴ Graham Rees liberally translates the passage in which these Latin phrases occur so: “in fact all perceptions of sense and mind are built to the scale of man [*ex analogia hominis*] and not the universe [*non ex analogia Universi*].” “Scale” captures only part of limitations placed on perception by our situatedness. See NO I §41 (OFB XI, 80-81).

⁴⁵ PAH §1 (OFB XI, 455).

It is easy enough to see that nature “free” and in its “ordinary course” exhausts what Aristotle meant by nature. These are “the *Species* of things,” those *kinds* of beings—men, dogs, doves—that are so familiar to us, the self-moving substances we do not ourselves bring into being. But Bacon brooks the tradition by numbering among natural beings those “monsters,” prodigies or “pretergenerations” that come into being when nature’s ordinary course is frustrated or chance intervenes. He also numbers among things natural the products of human art. Aristotle’s great mistake was to confuse nature in its ordinary course with nature itself and draw too sharp a line between things natural and things non- or unnatural. Nature is, for Bacon, a far more inclusive class.

But natural things are not indifferently natural. Bacon’s tri-part scheme preserves, in a way, Aristotle’s distinctions. Arrayed alongside nature’s abortions and man’s artifacts, nature in its ordinary course takes on a new guise. Pretergenerations and the products of human art, especially the latter, show us that nature in its ordinary course is just one possible realization of the potential latent in nature. Nature in its ordinary course reveals only nature’s habits, its proclivities, its deep-rutted ways. Nature’s habits are interesting and worth study, but it is a fundamentally different inquiry to ask, not what is the nature of this or that thing, but why nature tends to take this shape rather than some other possible shape.

Nature’s ruling regime would confine our experience even if we could somehow overcome every limitation resulting from our all-too-human situatedness. Each of nature’s three states—nature free, nature impeded, and nature restrained and molded—is only a mask that nature wears. Nature itself can never be unmasked; our experience is always of nature in some definite shape. Nor is it clear how many masks nature can put on. Human art allows us to “see bodies in an entirely new

guise and as a kind of alternative universe or theatre of things.”⁴⁶ But we have no way to know either the limits of art or whether art can exhaust all nature’s possibilities. Should we one day succeed in cataloging every experience and meticulously performing every conceivable experiment, we would still not be certain that we had seen all there was to see. Experience must remain radically open and incomplete.

Man can overcome these kinds of limitations, at least in part. We can indefinitely broaden our experience with instruments and especially with experiments. We can dissect nature and force it to take on ever new shapes. We can draw things together in novel ways and new situations, finely varying the quantity, quality, location, time, and position of each being and its parts.

But there may be other, unconquerable limits to our knowledge. The subtlety of nature surpasses not only the subtlety of sense but also, Bacon says, the subtlety of our intellect.⁴⁷ It is one thing to say that, since man “does and understands only as much as he has observed” of nature, the narrowness of his experience frustrates any attempt to know nature. It is another thing to say that the intellect itself may not be subtle enough to grasp nature’s subtlety. The problem here is not the narrowness of experience or the mind’s willful distortions, but a radical failure of adequation between the mind and nature. The stuff of mind may be too gross or its functioning too unlike the rest of nature to comprehend nature as it really is. Bacon quietly suggests that knowledge of the summary law of nature and the basic appetites and motions of matter may be beyond man’s ken. But these are limits that, by definition, we could not know. Nature, insofar as it exceeds in subtlety our own intellect, must remain forever hidden, a remainder whose scope and nature we can only guess.

⁴⁶ *PAH* §1 (*OFB* XI, 455). Cf. *DAS* II.2 (*SEH* IV, 294) and *DO* (*OFB* XI, 39).

⁴⁷ *NO* I §10 (*OFB* XI, 67).

2.4 Bacon's Dogmatic Skepticism

To take ordinary experience as one's starting point requires no up-front justification. Trust is our default attitude and perhaps the only sane way to begin thinking about and acting in the world. What, then, justifies Bacon's mistrust of ordinary experience?

His confident assertion that the Idol-ridden mind is no match for nature's subtlety cannot rest on a comparison of Aristotle's natural philosophy with the way things really are or, more generally, on a purported lack of adequation between our notions and the world, for by his own admission, we do not yet know the world as it really is. Nor does he attempt to show an incoherence in the Socratic approach to studying nature. His critique instead depends on an assumption that the ancients would refuse, that philosophy, if it is well-founded, progresses, achieves consensus, and above all becomes useful. Because the old science is stagnant, rife with controversies, and fruitless, Bacon rejects it. Why should a true philosophy be useful and progressive? Because Bacon says so. He asserts what he cannot prove, that the mind is no match for nature's subtlety. At bottom, his skepticism about the natural starting points in ordinary experience is dogmatic.

Bacon's remedy—his new method—is a second dogmatism, though it looks in its beginnings like skepticism.⁴⁸ The old skeptics were right to doubt our chances of knowing by the “natural” use of the intellect. But unlike the old skeptics, who despaired of ever knowing anything, Bacon begins with doubt so that he might end with knowledge. Not “*Acatalepsy*,” but “*Eucatalepsy*,” he says—knowledge is attainable, but only “by the right route.”⁴⁹ He describes his own way as a middle ground between the “arrogance of dogmatism” and the “hopelessness of *Acatalepsy*.” The “greatest obstacle to the advancement of the sciences . . . lies in men's despairing belief that the job is

⁴⁸ NO I §37 (OFB XI, 79).

⁴⁹ NO I §126 (OFB XI, 189-91).

impossible.” Not frivolous but “prudent and rigorous men,” after “meditating on nature’s obscurity, life’s shortness, the sense’s deceits, our fallibility of judgment, the intractability of experiments, and the like,” have despaired of any advancement or resigned themselves to the opinion that the growth and decline of knowledge is beyond man’s control. What justifies Bacon’s hope in a project prudent men have thought hopeless? Those same errors and uncertainties that justify his certainty about our ignorance of nature’s true nature ground his hope for philosophy’s bright future.⁵⁰ Had we “stuck for many years to the right way of discovering and cultivating the sciences and yet could make no further headway, the opinion that the things could be carried forward would doubtless be impudent and reckless.”⁵¹ Hope depends, then, on the conviction that we have not yet found the true method. But what guarantees that there is some better method, that “things themselves” are knowable, and that “the human intellect and its use and application” is “capable of treatment and cure”? Nothing, it seems, but Bacon’s saying so. The old skeptics’ claims about the impossibility of knowledge depends on an unstated dogmatism about the nature of mind and the nature of nature.⁵² But Bacon’s faith in his method’s power to overcome the mind’s Idols and nature’s subtlety is no less dogmatic.

By the same token, the naturalness of our trust in ordinary experience does not make it any less dogmatic. Ordinary experience and the dialectical philosophy of nature it grounds presuppose at least the general contours of a metaphysics or, better, a general idea of nature and man’s possible relations to it.⁵³ For Socrates’s confused method or Aristotle’s working procedure to be plausible

⁵⁰ *NO I* §94 (*OFB XI*, 151-53). Bacon devotes *NO I* §§92-114 to the reasons for hope, but “the errors of time past” are “the sum of arguments for future hope” and the “reason which above all others affords grounds for hope.”

⁵¹ *NO I* §94 (*OFB XI*,

⁵² *NO I* §67 (*OFB XI*, 107-09) and *NO I* §75 (*OFB XI*, 119-21).

⁵³ These presuppositions, of course, are not experienced as presuppositions. Our trust in ordinary experience does not require any reflection on its grounds. Even when we reflect philosophically on the conditions of experience, we do not begin by positing an idea of nature or a general metaphysics. We work toward an explanation like Socrates’s. Forms are a conclusion grounded ultimately by our trust in those starting points. If we are later asked to justify our starting point, however, those conclusions can begin to look like assumptions made on the way up. That is what ordinary experience and Socratic philosophy look like from the perspective of Bacon’s critical or “destructive” program.

ways of knowing nature, the grammar of thinking must correspond to the world's "grammar." Our linguistic distinctions must capture, at least roughly, real distinctions in being. The world must really be comprised of beings articulated into natural kinds and, more or less, the kinds that we take as basic in speech. Those kinds have causes—formal causes. Forms are responsible both for making a thing what it is and for our knowing it as that thing; they in-form both the mind of the knower and the thing she knows. It is the reality of forms and their double effect, accounting both for a being's nature and our knowledge, that guarantees the connection between mind and world.

Neither Plato's Socrates nor Aristotle believed that knowledge of those forms could be perfect or immediate. That we have not yet achieved wisdom does not suggest to them a fundamental defect in the way we pursue wisdom. It suggests instead that knowledge may be limited because of a disproportion between a knower and what she knows. Being may be too bright for us. We have to start among the shadows in the cave (Plato's Socrates) or with the wholes better known to sense perception (Aristotle). Yet they trust that being itself points the receptive mind to true principles. Plato's *eide* mean just that: the problem inherent in the surface of things and only in the surface of things is the heart of things.

Still, some fundamental questions may be destined to remain questions. About first things, we may never progress beyond wonder. We might call this an *aporetic* view of knowledge. Bacon lumps it together with more obvious and thoroughgoing forms of skepticism, and perhaps for good reason.⁵⁴ If all knowledge depends finally on reaching first principles, an account of knowledge that grants that those first principles can never be adequately grasped is, at bottom, skeptical. Bacon reminds us that skepticism itself can be a form of dogmatism.⁵⁵ We cannot conclude from our lack

⁵⁴ See NO I §67 (OFB XI, 107-09).

⁵⁵ NO I §67 (OFB XI, 107-09).

of knowledge that knowledge is impossible.⁵⁶ But neither can we conclude, as Bacon apparently does, from our current lack of knowledge to its future possibility.

Epistemologically, all dogmas are equivalent, but not all dogmas are morally equivalent. *Acatalepsy* is a dogma of despair. “[O]nce the human soul has lost hope of discovering truth,” Bacon cautions, “everything becomes more supine.” Men indulge in “agreeable debate and argument” but “dodge hard facts” and “rigorous inquiry.”⁵⁷ Why labor at an impossible task? The old dogmatists’ confident pronouncement about nature are no less enervating. They would have us believe that whatever can be known about nature is already known. Why go looking for more when you already have a surfeit?

Bacon’s own, more hopeful dogma is preferable chiefly because it spurs men to greater industry. We would all be better if, like “the more ancient of the Greeks,” we “just got on with it.” The Presocratics complained of the “intractability of investigation and the obscurity of things,” but would not be deterred, “thinking it better (apparently) not to argue the point (i.e. whether anything could be known) but to test it.”⁵⁸ Even without good grounds for hope, we must, “unless we evidently wish to be mean of spirit,” put ourselves to the test, “For not to try and not to succeed are quite different risks, for by not trying we cast aside an immense good but by not succeeding we lose a little human labour.”⁵⁹ Bacon cannot promise that we can know and master nature by his method, but his prudential calculus shows why we ought nevertheless to try it.

Socrates makes a similar argument in Plato’s *Meno*. Inquiry is impossible, Meno complains, for we either already know what we’re looking for, in which case no search is necessary, or we do not know what we’re looking for, in which case we wouldn’t recognize it if we found it. We are

⁵⁶ NO I §75 (OFB XI, 119-21).

⁵⁷ NO I §67 (OFB XI, 107-09).

⁵⁸ NO Preface (OFB XI, 53).

⁵⁹ NO I §114 (OFB XI, 173).

either dogmatists who know everything already, or skeptics who think nothing can be known. To counter this “debater’s argument,” Socrates exhibits a young boy recollecting how to construct a square twice the size of a given square. Where and when he acquired that knowledge is not as important, Socrates insists, as the demonstration’s moral: “that we will be better men, braver and less idle, if we believe that one must search for the things one does not know, rather than if we believe that it is not possible to find out what we do not know and that we must not look for it.”⁶⁰

But there are two problems with Socrates’s lesson. First, it offers encouragement, but no helps or aids. Having no firm rule and “trusting only to the onrush of the intellect,” Socrates stakes everything on “sharp thinking and ceaseless mental activity and agitation.”⁶¹ That “ceaseless mental activity” results, second, in “inquiry vague and endless.”⁶² Because it has no end, the search becomes more valuable than its object. Man’s greatest good is not to *know* virtue or *become* virtuous, but to talk about virtue every day.⁶³ Socrates’s solution to dogmatism is too open-ended. He only emboldens non-dogmatic or aporetic reason’s restlessness.⁶⁴ The result is a dialectical philosophy that goes round and round; what we conclude today is merely fodder for tomorrow’s discussion. The highest life is the life given over to the loving but never-ending pursuit of wisdom.

To find a more satisfactory middle ground between dogmatism and skepticism, Bacon must arouse a desire for knowledge that, unlike the ancients’ desire to know, can be limited or satisfied. His solution is to put theoretical reason in the service of practical ends. “[I]t is better to know what we need to and yet not to think that we have complete knowledge,” Bacon counsels, “than to think

⁶⁰ Plato, *Meno* 80e-86c.

⁶¹ *NO* Preface (*OFB* XI, 53).

⁶² *NO* I §67 (*OFB* XI, 107).

⁶³ *Apology* 38a.

⁶⁴ See *NO* I §48 (*OFB* XI, 85-87).

that we have complete knowledge and yet to know nothing that we need to.”⁶⁵ If properly directed, reason gives up its search for what is first and final to concentrate instead on those middle-ground truths that are actually discoverable and that unlock “all utility and capacity for producing works.”⁶⁶ To confidently embark on its work, reason must stifle whatever reservations it has about its own powers and starting points. Method supplies an unquestionable—a dogmatic—starting point shaped by skepticism about the mind’s natural functioning. Unlike the old dogmatism, it does not pretend to know what nature is. But unlike the old skepticism, it does not doubt the tools it has to discover nature. This is Bacon’s skeptical dogmatism or his dogmatic skepticism: a dogma that secures the conditions for inquiry, but not the conclusions of inquiry.

2.5 The Legitimate Use of Anticipations

Bacon’s complaint about the old science, we remember, is that it *anticipates* nature. But Bacon’s own method rests on a different set of anticipations—*Bacon’s* anticipations of nature. Unlike the ancients’ anticipations, Bacon’s anticipations are not the result of hasty abstraction from a few particulars. They are instead anticipations made in advance of inquiry, based not so much on any experience of nature itself, but rather on Bacon’s experience of the old philosophy’s failures. We can reconstruct an implicit *modus tollens* argument. If nature really is as Aristotle supposed it to be, the sciences founded on his philosophy should be less contentious and much more advanced. But the sciences are mired in controversy and largely unimproved. So we can infer that Aristotle was wrong

⁶⁵ NO I §126 (OFB XI, 191).

⁶⁶ NO I §66 (OFB XI, 107).

about nature. Bacon's own anticipations of nature take shape, then, as skepticism about or outright denial of the ideas of nature and mind dogmatically assumed by Aristotle and his followers.

Bacon's new idea of nature and his critique of reason attempt to describe what the world and the human mind must be like for a brilliant and diligent student of nature like Aristotle to get it so wrong. To explain Aristotle's error, Bacon supposes a rift between mind and things that the mind fails to see properly. Nature itself is cave-like, dim and hidden. "The evidence drawn from things is like a mask cloaking reality"; it "needs careful sifting."⁶⁷ Blind to its own faults, the human mind believes it perfectly mirrors nature. It is in fact an uneven mirror that constitutionally cannot receive nature's rays undistorted. The world that appears to us is not that world that is. The world as we experience it is made up of beings of definite kinds—trees, dogs, humans. But, Bacon says, our notions of these lowest species are "not abstracted or fetched out from things by proper means."⁶⁸ We take for granted—we "anticipate"—the articulation of beings into kinds, but in truth the world is populated by pure individuals and their acts governed by laws. Ordinary experience is not simply false. But the world as we ordinarily experience it is not nature simply, only nature in its ordinary course. The forms philosophers say explain the orderly articulation of being in nature's ordinary course are "fictions of the human soul,"⁶⁹ counterfeited parallels between things which are really monadic.⁷⁰ Bacon's rejection of the reality of forms, his radical reinterpretation of formal causes, and

⁶⁷ *MBT* (F, 66).

⁶⁸ *NO I* §16 (OFB XI, 71). See also *NO I* §66 (OFB XI, 103-105): "Again, when man reflects on nature in its free state, he meets it in the species of things—animals, plants and minerals—and from this he easily falls for the idea that there exist in nature certain primary forms of things which nature strives to bring out, and the idea that all the variety left over arises from obstacles and aberrations of nature which occur as she carries out her work, or from the conflict of different species and the transplantation of one into another. And the first idea has brought us the primary elementary qualities, the second occult properties and specific virtues, both of which belong among the worthless short cuts of thought which the soul takes to avoid more taxing exercise."

⁶⁹ *NO I* §51 (OFB XI, 89).

⁷⁰ *NO I* §45 (OFB XI, 83).

his fundamental claim about the severed commerce between mind and things come, then, to the same thing.

Underlying Bacon's critique of reason, then, is a substantive teaching about the nature of nature; his method, too, supposes a general metaphysics, an inventory of beings, and an account of how real beings manifest or fail to manifest themselves to us. But these anticipations, unlike the corresponding Socratic anticipations, are *critical*, the result of Bacon's dialectical engagement with received philosophy.

In introducing his novel divisions of natural philosophy in the *Advancement*, for example, Bacon endorses two claims about nature that are clear rejections of important Aristotelian positions.⁷¹ The first—nature hides—he takes from Democritus. Aristotle had said that the mind is in a sense all things, that the mind is basically receptive and the world's intelligibility is more or less in plain sight. Speech captures and properly articulates that intelligibility. Against Aristotle, Bacon insists that the intelligibility of nature is not on the surface but buried in deep mines. Language is more likely to mislead than enlighten us and the human mind is ill-equipped to unearth the truth without proper aids and helps. Truth, therefore, is best discovered not through abstraction or the dialectical inspection of our speech about beings, but instead through a methodical dissection of nature's minute material parts, their structures, and their processes.

Bacon borrows the second claim—art is a second nature—from the alchemists. Not everything, says Aristotle, exists by nature. Animals, plants, and the simple bodies (for example, earth, fire, air, and water) exist by nature because they appear to have within themselves a principles of motion and of stand-still. That internal principle is a thing's *nature* or *form*, the *end* which the thing aims to be. A bed or a garment, by contrast, comes to be because of a principle belonging to the

⁷¹ *AL* II (*OFB* IV, 80).

carpenter or the tailor and so exists by the craftsman's art rather than nature. Products of art have a *form*, but perhaps not a *nature*; they come to be not for the sake of their own end but for the sake of some human purpose. Art and nature do not differ essentially, Bacon says, and there may be, on his understanding, no meaningful sense in which a principle could be *internal* to a "thing" or belong to it "primarily" rather than "accidentally." Nor should we reject as "nature frustrated" those prodigies and monstrosities that overstretch our notions about natural beings. If those natural kinds we ordinarily meet with are not ultimate and if there is no end that nature seeks, it makes no sense to distinguish nature's failures from nature's successes.

Bacon's new idea of nature is, in short, a repudiation of the ancient and especially Socratic-Aristotelian teaching about nature. You could generate a list of Bacon's most fundamental assumptions about nature by denying the truth of several of Aristotle's most fundamental claims about nature. And you could trace those rejections all back to a fundamental rejection of Aristotle's teaching about the reality and nature of substantial forms or, what perhaps comes to the same thing, Aristotle's metaphysics of substances and accidents, actualities and potentialities. The dialectical origin of Bacon's own assumptions also accounts for their indefinite quality. Rather than a positive theory about what nature *is*, Bacon's idea of nature is really a set of claims about what nature is *not*. You might expect, for example, that his rejection of Socratic-Aristotelian idealism would push Bacon to adopt a materialist or even atomist theory. And it does, sort of. He certainly inclines more toward a materialist account. But he stops short of any positive assertion about nature's ultimate principles, in part because he believes knowledge can be step-wise and methodically built without knowing those ultimate principles and in part because his own critical starting point only sanctions negative claims about the nature of nature.

What legitimates these anticipations? We have already rehearsed Bacon's prudential argument. His anticipations are also better able than Aristotle's to account for our ignorance and impotence, for the fact that humankind's best minds have failed for some two thousand years to grasp nature in thought or master it in action.

2.6 Bacon's Escape from the Cave of Ordinary Experience

Bacon gives the name *Idols of the Cave* to those individual proclivities that imprison men in their "own special cave or den," but his characterization of the Idols of the Tribe invite us to see the world of our everyday experience as the cave common to man as man.⁷² He approvingly reports Heraclitus's saying that "men looked for the sciences in their own little worlds and not in the big wide world that is common to all."⁷³ But even that bigger, wider world is not, after all, big and wide enough. We are constitutionally or "by nature" ill-suited to know the world as it is in itself. Our desires corrupt the intellect; we see what we want to see. The grossness and "evenness" of the mind is no match for nature's subtlety, vertiginous variety, and unceasing motion. Our outlook is parochial; we artlessly trust in the availability and intelligibility of things. But man is not the measure. There is not now and perhaps never was any reliable *commercium* between Mind and Things.⁷⁴ Our ordinary experience of nature in its ordinary course is a deep, deep cave.

Plato's Socrates thought he could escape the cave by examining what we say about the world. He and Aristotle both counted on language's ability to work, as it were, behind our backs, to grasp truths about the world and make those truths available to us. Language sometimes misleads;

⁷² NO I §42 (OFB XI, 81).

⁷³ NO I §42 (OFB XI, 81). Rees guesses that Bacon is referring to Sextus Empiricus, *Against the Logicians* I, 133. See OFB XI, 638.

⁷⁴ IM (OFB XI, 3).

opinions can be incomplete or false. But if we pay attention to what men say, we can discover the inadequacy of those opinions and correct them. We ascend to knowledge of the highest beings and first principles through everyday speech.

Bacon takes a darker view of language. “[M]en believe that their reason rules words,” he warns, “but it also happens that words turn and bend *their* power back upon the intellect.”⁷⁵ Words, he complains, “are generally imposed according to common capacity, and divide things up on lines most obvious to the ordinary intellect.”⁷⁶ Ordinary language only articulates ordinary experience, and like notions derived from everyday experience, words are often “muddled, ill-defined, and rashly and roughly abstracted from the facts.”⁷⁷ Take a word like *moist*, for example, and “you will discover that this word *Moist* is nothing but a vague label for different actions which refuse to be reduced to any common factor.”⁷⁸ Bacon distinguishes eight different senses in which something can be said to be *moist*. If “a sharper intellect or a more careful observer wants to move the lines the better to match them to nature, words drown them out.” Our clumsy and promiscuous way of speaking obliterates nature’s real differences, and the effort to put our words right tends to degenerate into useless “controversies about words and names.” Definitions cannot help “because definitions are made up of words, and words beget words.”⁷⁹ We are trapped by language.

So Socrates’s and Aristotle’s trust in dialectic was misplaced. Speech has no special ability to disclose or point us to truth. More likely, language leads us astray.⁸⁰ Language, then, so far from

⁷⁵ NO I §59 (OFB XI, 93).

⁷⁶ NO I §59 (OFB XI, 93). See also NO I §43 (OFB XI, 81).

⁷⁷ NO I §60 (OFB XI, 93-95).

⁷⁸ NO I §60 (OFB XI, 95).

⁷⁹ NO I §59 (OFB XI, 93).

⁸⁰ Socrates exemplifies how Bacon believes we can be duped by words. Before Socrates can tell Meno how one becomes virtuous, he wants Meno to define virtue. Meno instead offers a whole swarm of virtues—a man’s, a woman’s, a child’s, a free man’s, a slave’s. Unsatisfied, Socrates labors to make Meno understand that he wants not a list of virtues, but the formula by which each of them is a virtue. Since we use the same word to cover all the cases, Socrates expects to find some form common to them all. Language’s elasticity—its ability to hold together a multiplicity—suggests to

freeing man from his native cave, is the very chain by which he binds himself. To escape, Bacon argues, men must return “to the particulars themselves and their succession and order, . . . repudiate their notions for a while, and begin to grow used to things themselves.”⁸¹

But words are not all that stand between us and the experience of things themselves. Freed from language’s distortion, we must still contend with the mind’s other Idols and nature’s hiddenness. “Now to the human intellect reflecting on it,” Bacon says, “the fabric of the universe looks in its construction like a labyrinth, where we find everywhere so many blind alleys, such deceptions and misleading signs and such oblique and intricate convolutions and knots of nature.”⁸² Naïve or ordinary experience is no better than Socratic dialectic at solving nature’s labyrinth. Guided through “the woods of experience” by “the uncertain light of the sense which sometimes flares up and other times dies down,” we are, like those “errant souls” who offer themselves as guides, likely to become “ensnared in the thickets.” Nature’s “subtlety,” its “intricate variety,” and the indistinguishability of its parts “cannot be overcome by any amount of genius or repeated gamblings on the results of experience.”⁸³ Naïve experience is blind and wandering; nature does not point the way. We cannot read off nature’s intelligibility. Like Theseus’s, “our tracks must be guided by a clue, and a sound policy must secure every step of the way right from the very perceptions of the senses.”⁸⁴

What is that clue or policy? The method for educing general axioms from particulars depends on a sound starting point in experience. Mind must at last or once again be united to world.

Socrates the existence of the form of virtue, of Virtue Itself. That we call so many things *virtues* in no way warrants the reckless abstraction from Meno’s many instances to Socrates’s single Idea of Virtue. Neither should our indiscriminate use of the word *moist* send us looking for the Moist Itself.

⁸¹ *NO* I §36 (*OFB* XI, 77-79).

⁸² *IM* Preface (*OFB* XI, 19).

⁸³ *IM* Preface (*OFB* XI, 19) and *DSV* “Dædalus” (*SEH* VI, 735).

⁸⁴ *IM* Preface (*OFB* XI, 19).

As we have seen, though, we cannot rely on ordinary experience to cure the mind's Idols or overcome nature's hiddenness. So we need a radically new and more active mode of experience to force nature out of hiding and escape from the cave of ordinary experience. Bacon proposes three "helps" or "aids" to correct and reduce experience and make it fit for interpretation: natural histories, *experientia literata*, and experiments. Each promises to return us to "things themselves." In each case, however, reason runs ahead of or anticipates experience and points the way. This is the strange marriage of the rational and empirical faculties Bacon proposes. By anticipating nature, reason-guided experience can better pierce nature's subtlety, comprehend its variety, and make useful distinctions. In the next four sections, I will try to draw out the nature of that marriage, its reconstitution of experience, and the idea of nature on which it depends by looking, in turn, at each of these "helps."

2.7 Natural History as Methodically Disciplined and Reason-Guided Experience

Let us look first at the new natural history Bacon projects as the third part of his Instauration program.⁸⁵ Bacon contrasts his new natural history with the old, *humanistic* natural histories it supersedes. Like dialectic philosophers, humanistic natural historians were too concerned with words. Bacon's new natural philosophy will return us to the *experience of things themselves*. He wants to jolt us into a wider, and so truer, experience of the world. But what looks at first like a straightforward enlargement of experience is really a radical transformation of the basic character of experience. We can glimpse that transformation by paying attention to how Bacon's teaching about the mind's Idols informs his prescriptions for the gathering of natural histories.

⁸⁵ See especially *DO* (OFB XI, 37-43) and *PAH* Preface (OFB XI, 451-53).

It is easy enough to see how Bacon's projected natural history drastically enlarges the scope of ordinary experience. Most men have neither the leisure, the patience, nor the interest to carefully observe and record out-of-the-way or unusually subtle natural beings, their qualities, and their motions. Yet Bacon insists that there is nothing so low, common, or strange to be unworthy of our study.⁸⁶ Such trivia in itself is unimportant, but when joined together with other facts can become the more solid experiential foundation of philosophy. We may profit, too, by cataloging man's artifacts and nature's aberrations alongside nature's species. Only stubborn and dogmatic men would imprudently exclude from the record whole classes of beings because of a distinction settled before the fact and without all the evidence. In comparison to our usual experience of nature, then, this more inclusive natural history provides more and more diverse material, a more comprehensive record of the world as it really is.

Just as noteworthy as its greater mass and scope is what the new natural history will exclude. In short, Bacon junks all "philological" matter and applies stricter juridical rules when weighing the credibility of witnesses and their testimony. Natural history ought not become "a kind of treasure-house of words" but "a solid and reliable narrative of things." The "weighty names of the ancients" and the "weighty tomes of the moderns" give authority and an imposing bulk to the existing natural history, but, Bacon assures us, "if one strips from it the fables and antiquities, the citations and opinions of authorities, the empty squabbles and controversies, and finally the philology and embellishments (which are more appropriate to the table-talk and night-work of learned men than the building up of philosophy), it will undoubtedly be cut down to nothing very much."⁸⁷

⁸⁶ *NO I* §120 (*OFB XI*, 179-81).

⁸⁷ *DGI* ch. 3 (*OFB VI*, 105-107).

Graham Rees helpfully contrasts Bacon's own prescriptions for natural-historical writing with the actual histories penned (or thought to have been penned) by four natural-historical authorities: Aristotle, Pliny, Conrad Gesner (1516-1565) and Georgius Agricola (1494-1555).⁸⁸ In particular, Rees's description of Gesner exhibits natural history's typically uncritical acceptance of old authorities and its fondness for erudition. Entries for each natural kind would begin with a section on the names of the animal and end with a long section containing speculative etymologies, "proverbial lore," "similitudes, the sayings of the poets, and generally things which had to do with 'words rather than the things themselves.'" "How could you not talk of the dragon with the same seriousness and attention that you paid to the elephant," Rees jests, "when good authors had spoken of both and you could provide pictures of them, and when you wanted to make the reader (in one of Gesner's favourite words) *iucundissimus*, i.e. thrilled to bits?"⁸⁹ Such *humanistic* natural history no doubt could be diverting, but the humanistic historian, in busily tracking down every obscure ancient source, telling a good story, or relating a curious fact, left off the more hard-nosed and patient inquiry into nature. He treasured words more than the things they bespoke or too-credulously trusted that those things could be known through our speech about them.

These humanistic natural histories were fitted to man's capacities, meant to satisfy his specifically human desires. Made to the measure of man, they were, in a sense, not *natural* but *humanistic* histories. Such uncritically *wordy* histories obscure nature rather than reveal it and bind us more strongly to wrong-headed and vulgar notions.⁹⁰ Their concern with "empty squabbles and controversies" rendered them *sophistical*. Bacon's new natural history will be more ample and more judicious, less burdened by tradition and less concerned with erudition than any before it.

⁸⁸ OFB XII, xix-xxvi.

⁸⁹ OFB XII, xxiii-xxiv.

⁹⁰ See especially NO I §59 (OFB XI, 93).

But freeing natural history from the tyranny of old authorities, purging it of philological matter, and enlarging it dramatically is not enough to transcend our all-too-human perspective, grab hold of nature, or to nourish infant philosophy with its sustaining milk. Because the mind's Idols corrupt all the way down, infecting even our most basic notions, experience cannot correct reason. Experience, like reason, must be subjected to a new discipline. So Bacon's novel approach to natural history also extends to experience the prophylactic measures Bacon urges in *Novum organum* I.

Let us see, then, how the requirements of the new natural history attempt to solve at the level of experience problems that Bacon initially attributes to reason. He complained of the mind's willfulness, its propensity to see a world suited to man's theoretical and practical purposes. Bacon's instructions for a natural history deliberately curb those tendencies by separating the fact-gathering work of the history from the cause-discovering work of interpretation. As a disinterested record of fact, natural history is unmotivated by practical concerns of the moment and purposefully distanced from any particular hypothesis or theory, including the "theorizing" implicit in ordinary experience. These scrupulous observations will someday be both practically and theoretically useful, Bacon promises. But because they are not marshaled for any specific purpose, they are less likely to be distorted by the mind's willfulness.

Bacon also complained of the mind's sluggishness. The mind, by nature, is overly impressed by what strikes it immediately and vividly. The natural history artfully organizes the remote and heterogeneous instances the mind would, without help, lose track of. And where the mind is too easily swayed by affirmative instances, the natural history can give extra weight to negative instances and, more generally, can privilege the right kinds of experience. The investigator of nature has before him a standing record, more faithful, more diverse, and more complete than he could ever lay up in memory, of all the relevant experiences drawn together with each instance assigned its proper

place and weight. Bacon's natural history even overcomes, in part, man's situatedness. The demand for a comprehensive history forces men to look again at things ordinary and take notice, perhaps for the first time, of things useless and indifferent to human purposes. By gathering together the experience of many men from diverse times and diverse places, the natural history also gives the natural philosopher a broader experiential base, less constrained by his own time and place, than he could ever have had by his own efforts. If properly laid up, such second-hand experience may prove more useful than what we see for ourselves.

Stripped of philological matter, protected from the mind's willfulness, and attuned to nature's more remote and heterogeneous instances, natural history supplies "the primary matter of philosophy" or "the basic stuff and raw material of true induction."⁹¹ It gathers and lays up, like comestibles in a storehouse or grain in a granary, the material that will one day become, by means of the new logic's machinery, the well-grounded and useful axioms of the new science. If natural philosophy is pictured as a pyramid, natural history is its base. Without an experiential foundation, reason's house is only a stately pile; without experience's nourishing milk, reason languishes; without the material of experience, reason's machinery sits idle. Described in this way, these prophylactic measures seem to make a salutary division between our experience of the world and our theorizing about it. They safeguard experience against the mind's corrupting prejudices so that, instead of imposing its own nature on the world, the mind can take its measure from things themselves as they are in truth.

But these images invite us to draw too sharp a distinction between the natural-historical and the logical parts of Bacon's program. They encourage us to see the natural history as that program's *empirical* moment and the new method as its *rational* moment. Though yoked in marriage, the

⁹¹ PAH (OFB XI, 455).

empirical and rational faculties retain their own distinct character. It is madness, of course, to insist that the world fit our idea of it. The mind, even a thoroughly purged and carefully disciplined mind, “cannot supply and furnish the matter of knowledge.” If we do not wish “to fabricate apish mockeries of worlds,” imperious reason must be made to capitulate to the facts of experience.⁹² Their promised union is nothing more than a transfer of headship from one spouse to the other.

But Bacon, I think, intends a more radical transformation of both the rational and empirical faculties. In *Distributio operis*, he says that his new natural history differs from the old natural histories “in its end or function, in its very mass, in its subtlety, and also in its selection and organisation for the procedures to come after it.”⁹³ The history’s greater mass and new principle of selection, while important, fail to get at the heart of Bacon’s real innovations. More experience of the kind the ancients relied on will not advance the sciences. Left to itself, “undisciplined” experience wanders around and lays up what it discovers haphazardly.⁹⁴ So we need “a class of experiments much more subtle and simple than those which we just bump into”; we need experiences “which no one who was not pressing forward on a certain road to the discovery of causes would have thought to investigate.”⁹⁵ And those new, intentional experiences need to be “properly arranged for the work of interpretation which follows it.”⁹⁶ Only reason can set experience on a more certain road and organize its contents to make them suitable for reason’s own work. There is, then, no purely empirical moment. The experiential basis of Bacon’s natural philosophy is laid under reason’s direction and for reason’s ends.

⁹² *DO* (OFB XI, 37).

⁹³ *DO* (OFB XI, 39). Graham Rees reduces Bacon’s list of differences to three: “function, content, and scope,” though his discussion of the history’s new scope embraces a far more ranging consideration of the history’s organization and some suggestive comments about the character of the experience it catalogs. See *OFB* XI, xxv–xxxiii.

⁹⁴ *NO* I §82 (OFB XI, 131).

⁹⁵ *DO* (OFB XI, 41). Cf. *NO* I §82 (OFB XI, 131).

⁹⁶ *PAH* (OFB XI, 451).

Such a picture of Bacon will be a scandal to those who know the Lord Chancellor as the great despiser of rationalism in science and the great champion of a return to a direct experience of things themselves. Yet almost every one of his criticisms of over-confident or arrogant rationalism is counterbalanced by a rebuke of haphazard or blinkered experience. It would be far more surprising, in fact, if the same man who rejected the old trust in the mind's receptivity were to put his faith in a naïve empiricism.

A few odd features of Bacon's Instauration program point to this more complicated relation between reason and experience. The absence of any sharp line dividing the collection of natural histories from the method for inducing axioms suggests that, in uniting them, Bacon means to transform both reason and experience. Take, for example, the tables of presence, absence, and degree that Bacon describes and exemplifies in *Novum organum* II. Do these tables belong to a late stage of natural history, or an early stage of interpretation? Bacon frustrates any effort to definitively place them. He turns, in the tenth aphorism, to "the directions concerning the *Interpretation of Nature*." We must begin, he says, by preparing "a sound and sufficient *Natural* and *Experimental* History." The natural history as well as the tables and "structured sets of instances" that impose order on experience "so various and scattered" and make experience ready for the work of the intellect both belong to what Bacon here calls the *Interpretation of Nature*, his preferred formula for his new logic or method.⁹⁷ The collection of experience is, from the very beginning, ordered to its eventual interpretation and so also shaped by the demands of that interpretive method. Reason's determination by experience, in this way, at least, is reversed: the natural history takes its direction from the new rules governing the use of the rational faculty.

⁹⁷ NO II §10 (OFB XI, 215).

Bacon's awkward ordering of the Instauration's parts offers yet another clue about the novel character of experience. In practice, Bacon asks that the natural history be completed or much advanced before the work of interpretation begins. But in laying out his six-part plan, he places the new logic before the new natural and experimental history.⁹⁸ Because he expounds the new logic before the material on which it will work, Bacon believes he must include, as the fourth part of the Great Instauration, examples or models of the method applied to the newly-gathered material. He attempted to explain his method by way of just such an example in the second book of *Novum organum*. After cataloging of instances of heat, the absence of heat, and the degrees of heat, he complains: "Anyone can see how poor we are in history from the *Tables* presented above."⁹⁹ Because his presentation of his new logic anticipates the natural history on which that new logic must depend, Bacon has had to "insert traditions and tales" in place of "verified history and reliable instances."¹⁰⁰ Where there are no tales nor traditions, he has been "reduced to using these phrases: *Perform an Experiment or Investigate further.*"¹⁰¹

Surely Bacon's presentation would be both more persuasive and more instructive if, starting from a proper and complete natural history, he had run through the whole process of induction and concluded with some reliable axiom or form of heat. He proceeds anyway, and his willingness to exemplify his logic on the basis of imperfect facts risks undermining his most basic teaching. "The

⁹⁸ A remark in *HNE* highlights the discrepancy between Bacon's ordering of the Instauration's parts and the sequence in which those parts should be developed to advance Bacon's new science. He says, "Now since in my *Instauration* I have placed natural history, history of the kind fit for my purpose, in the third part of the work, I have thought it good to turn my attention to this business first and deal with it at once" (*OFB* XII, 11). A capable and well-disposed thinker who possessed the method without a proper natural history "still does not know how to proceed, nor how to get ready to re-equip himself for philosophy," but that same man, if he could gain "the right timber and material" from a proper natural history, could nevertheless "raise much more solid constructions" without any hint of the new method. "And so it comes down to this, that my *Organum*, even if it were finished, would not carry forward the Instauration of the Sciences much without Natural History, whereas Natural History without the *Organum* would advance it not a little" (*OFB* XII, 13).

⁹⁹ *NO* II §14 (*OFB* XI, 253).

¹⁰⁰ *NO* II §14 (*OFB* XI, 253).

¹⁰¹ *NO* II §14 (*OFB* XI, 253).

end of my logic,” Bacon says in the concluding aphorism, “is to teach and instruct the intellect not to batten on and embrace abstract things with the mind’s fragile tendrils (as common logic does), but really to slice into nature, and discover the virtues and acts of bodies, and their laws as they are determined in matter, in such a way that this science may emerge not just from the nature of mind but from the very nature of things.” And so “it is no wonder,” he adds, “that my text is everywhere shot through and illustrated with reflections and experiments on the nature of things by way of exemplifying my art.”¹⁰² It would be more truthful to say that Bacon has given us a procedure that everywhere points to the need to “Perform an Experiment” or “Investigate further,” but that nevertheless sets to work on material that (against his own advice) precipitously anticipates nature. That his art can be exemplified without yet really slicing into nature to discover the virtue and acts of bodies suggests that, against his protestations, Bacon’s art grows out of a consideration of mind rather than the nature of things. It is the new logic—grounded in a critique of the mind and a new, dialectically achieved idea of nature—that teaches us to see “the very nature of things.” Reason does not follow upon experience, but must rather guide experience from the very beginning.

Still, we might think that, even if reason points the way, experience is still experience. Bacon, however, suggests (albeit in a metaphor), that the the rational and empirical faculties, once legitimately married, deal neither with the raw facts of the empiricist nor the rationalist’s ideas, but constitute novel objects for their joint work. Empirics are like ants: they “only store up and use things.” The dogmatists or rationalists, on the other hand, are like spiders who “spin webs from their own entrails.” Neither approach yields knowledge of nature or power over it. Bacon, however, discovers a promising middle path. The new philosophy, like the bee, “collects its material from the flowers of field and garden, but its special gift is to convert and digest it.” Likewise Bacon’s new,

¹⁰² *NO II §52 (OFB XI, 443).*

active philosophy “depends not only or mainly on the powers of the mind”—he is no rationalist—
 “nor does it take the material gathered from natural history and mechanical experiments and store it
 unaltered in the memory but lays it up in the intellect changed and elaborated.”¹⁰³

This description places the moment of magical transformation between the gathering of
 natural-historical material and the laying up of that material in the intellect. What intervenes between
 the “gathering” and the “laying up”? There is, as we have seen, good reason for the ambiguity. If we
 were to admit a purely empirical moment distinguishable from some rational modification of that
 empirical “matter,” we would reopen the gap between mind and world. The bee could not make his
 honey without the flower’s nectar, but understood rightly, that process of conversion begins at its
 first gathering. Likewise, there is no wholly raw or non-rationalized material of experience. Active
 and potent philosophy is built on experience that is always already rational.

Bacon’s newly constituted experience is not, however, rational in the way that ancient
 philosophy takes ordinary experience to be. A thinker like Aristotle could appeal to experience just
 because it was shot through with rationality. The *logos* of the mind merely reflects (and so is
 dependent on) the *logos* of the world. Knowing on this account is just the adequate reception of
 being. Bacon’s accuses Plato, Aristotle, and their followers of imposing rather than discovering that
 rational order. Their experience never was free of the mind’s distorting rule. The world the ancients
 thought they saw was only the world they wanted or were able to see. Yet Bacon’s marriage of
 reason and sense does not make the mind perfectly receptive. There is, finally, no return to Adam’s
 original, innocent, and unmediated experience of the world. Method cannot flatten the mind’s
 uneven mirror or make nature less labyrinthine. The mind cannot simply read off the world’s
 rationality.

¹⁰³ NO I §95 (*OFB* XI, 153).

Bacon's program, in fact, is a total rejection of a philosophy grounded on the mind's receptivity. His method, like ordinary experience and Socratic dialectic, must impose some order on experience. The difference is that, in Bacon's case, reason's order is imposed knowingly, without naïvely trusting in nature's goodness or availability to reason. Nature appears to us as a labyrinth; its *logos*, if there is any, is deeply buried. If we cannot rely on nature to reveal itself, if we cannot rely on our own minds to be faithfully receptive, and if we must nevertheless depend on our knowledge of nature to secure our daily bread, we must press our own claim. Passive or receptive knowing must give way to active inquiry. We must put the question to nature and force it to yield up its answers. And because nature's answers are almost never direct and unambiguous, they will require interpretation. Nature cannot speak for itself. Experience can be made articulate only through reason's intervention. The natural historian's job is to make experience literate and ready for the work of interpretation. Nature itself is the subject matter, but the Book of Nature is written by man.

While reason cannot be fully determined by nature, while it must guide and organize experience by anticipating what it will discover, reason cannot simply flout nature's lead. Once it compels nature to speak, reason must listen. So reason must be hobbled so it does not run too far ahead of experience.¹⁰⁴ Ordinary or "natural" reason must be disciplined by an artificial method. Guided by reason's anticipations, experience can gather materials appropriate for the new logic. But such *methodical* or *artificial* experience is not the ordinary experience from which Socratic philosophy begins.

¹⁰⁴ See NO I §104 (OFB XI, 161-63).

2.8 The Anticipations of Nature Guiding Bacon's Natural History

In the previous section, I argued that Bacon's artificial method requires an artificial experience, both shaped by his new idea of science. And if I am right, the character and structure of his projected history should give us a glimpse of the idea of nature guiding it. Here I want to focus on three especially revealing innovations:

1. the turn from a natural history of *beings* and *substances* to a history of the micro-structures and micro-processes of *bodies*,
2. the expansion of natural history to include arts, artifacts, and "monsters," and
3. the histories of *simple natures* or *cardinal virtues* that take the place of the natural-historical investigation of *specific natures*.

Working backward from these prescriptions for a new natural history, we can see how even the experiential basis of Bacon's new science is transformed by his rejection of Aristotelian metaphysics and Aristotle's idea of nature.

Despite what I just said about Bacon's innovations, some parts of his natural history can look surprisingly old-fashioned. He divides his History of Generations, the natural-historical account of nature in its ordinary course, into five parts: (1) a history of the ether and the heavenly bodies, (2) a history of meteors and the region between the moon and the earth's surface, (3) a history of the earth and sea, (4) a history of the elements: fire, air, earth, and water, and (5) a history of "the species of natural things—metals, plants and animals."¹⁰⁵ Bacon seems to divide the world, as Aristotle had before him, into *places*: the heavens, the earth, and the airy region between them. Terrestrial natural beings are either *elemental* or articulated into some number of natural *species*. These divisions correspond, more or less, to the "natural" divisions we make in our everyday experience, and so also to the divisions made by the old natural philosophers.

¹⁰⁵ *PAH* §4 (*OFB* XI, 459-463).

But a second look shows that Bacon puts little stock in these divisions. Take, for example, his question about which division a history of comets should fall under. Are they, as Aristotle's theory of the crystalline spheres demands, meteorological phenomena, or are they, as a growing body of observational evidence suggested, disturbances in the extra-lunar heavens? Bacon decides to treat them as sublunar phenomena "whatever the truth of the matter may be."¹⁰⁶ In doing so he neatly sidesteps a highly controversial issue, declining to endorse the modern view without committing himself to the Aristotelian position. He can be diplomatic because, as Charles Whitney argues, these natural-historical divisions are like rhetorical topics: non-arbitrary but conventional schema—"general notions about the right way to divide up the multiplicity of nature"—that allow the orator or the natural historian to structure unstructured materials.¹⁰⁷ Like a topical index, the divisions of the natural history can make it easier to retrieve "facts" laid up for later use even if those divisions do not correspond to nature's own joints and ligatures. Observations of comets can be lumped in with celestial or meteorological phenomena so long as one knows where to find the comet data when it is needed.

But Bacon's anticipations of nature are not merely conventional, and not all conventions are similarly useful. Gesner, for example, had arranged his natural history according to natural kinds—a perfectly convenient scheme if one aims to display the variety of nature's types or "to please by the agreeableness of the narrative," but ill-suited if one's goal is to set down "the stuff and matter of true and lawful induction."¹⁰⁸ In natural history, as in everything else, "the end governs the mean."¹⁰⁹ Before we can properly gather our "facts," we need to know what we want to do with them. Natural history is meant to provide the material from which general axioms can be induced. So it is the

¹⁰⁶ *DGI* ch. 4 (*OFB* VI, 109).

¹⁰⁷ Charles Whitney, *Francis Bacon and Modernity*, 67-68.

¹⁰⁸ *DGI* ch. 3 (*SEH* V, 507-08). See also *PAH* §2 (*OFB* XI, 455).

¹⁰⁹ *PAH* §2 (*OFB* XI, 457).

machinery of method—and so Bacon’s new idea of nature—that guide the collection and organization of those natural-historical materials.¹¹⁰

Consider, for example, how method shapes the last two divisions of Bacon’s History of Generations, the “history of elements” and the “history of species.” *Elements* here means nature’s grosser and more common structures, not “the primordia of things,” first principles, or causes.¹¹¹ The quantity of these “bodies”—fire, earth, air, water—exceeds the quantity of the “bodies” Bacon lumps together in the history of species because “their schematisms need a texture of matter easy and obvious.” These other “bodies,” by contrast, “have a very small quantity in relation to the universe, and are poorly supplied, because their texture of matter is highly structured and subtle, and for the most part determinate and organic, such as the species of natural things—metals, plants, and animals.”¹¹² Thus Bacon is not distinguishing the organic from the inorganic, the ensouled from the soul-less. Metals belong to the history of species rather than the history of elements because their parts, like those of plants and animals, are more highly structured. Putative complexity of minute structure is not, of course, a distinction we ordinarily use to make sense of and navigate our way through the world. Bacon’s divisions instead presuppose important claims he wants to make about the nature of nature and the method that best discovers it. Beings are really *bodies*, some more highly structured than others. It is the structure of a body’s subtle or minute parts which causes its particular “nature.” So the right method of investigating natural beings is to dissect or anatomize, to search out a being’s schematisms and the subtle motions of its minute parts.

¹¹⁰ Cf. Dennis Desroches, *Francis Bacon and the Limits of Scientific Knowledge*, 130: “natural history—material knowledge—is itself reconceived according to the theoretical presuppositions that govern the method that will deal with it.”

¹¹¹ *PAH* §4 (OFB XI, 461).

¹¹² *PAH* §4 (OFB XI, 461).

The problem is that these subtle structures and motions are for the most part too small or too fast to be directly witnessed by ordinary perception. Bacon's new natural histories therefore include several artifices intended to anatomize wholes into their *parts* and trace their *generative processes*. For example, in the *Catalogus historiarum particularium*—a list of 130 diverse histories he would like to compile—Bacon calls for a history of fish (#36), birds (#37), quadrupeds (#38), and serpents, worms, flies, and other insects (#39), singling out for special attention the “parts” and “generation” of the species within each broad category.¹¹³ Beginning “with concrete bodies as we find them in nature in her ordinary course,” we ought

to investigate from what beginnings, by what means and by what process gold or any other metal or stone is generated, starting with its first menstrua or rudiments, all the way up to the finished mineral; or, in the same way, by what means plants are generated, starting with the first concretions of juices in the earth, or with seed, and ending up with the mature plant, after the whole run of motions and various and protracted travails of nature; or likewise of the orderly unfolding of the generation of animals, from conception to birth; and likewise for other bodies.¹¹⁴

This is not the “kind of anatomy . . . subject to sight and sense,” but a “true anatomy” that reduces all bodies to minimal parts and their structures. Guided by ordinary experience, we attend only to “certain visible degrees, marks or stages of a process in bodies.” Guided by Bacon's anticipations, we search out the “unbroken process which for the most part evades sense.” The artless investigator waits for nature to reveal itself. The artful investigator knows to ask, in all cases of generation, “what is lost and given off, what stays behind, what enters; what is dilated, what contracted; what is put together, what separated; what is continued, what cut off; what spurs on, what curbs; what dominates, what yields; and much else besides.”¹¹⁵ For this reason, the history of arts is perhaps even more useful than the history of generations, for the history of arts “displays things in motion” and

¹¹³ *CHP* (OFB XI, 477-479).

¹¹⁴ *NO II* §5 (OFB XI, 207).

¹¹⁵ *NO II* §6 (OFB XI, 209-11).

“strips the mask and veil from natural things which generally lie concealed or hidden beneath a variety of shapes and outward appearances.”¹¹⁶ We should pay special attention to those arts “which display, change and prepare natural bodies and material things, for instance agriculture, cookery, chemistry, dyeing, the manufacture of glass, enamel, sugar, gunpowder, pyrotechnics, paper, and the like.”¹¹⁷ These arts all work changes at or beyond the limit of what we can perceive, unlike “weaving, woodworking, building, the work of millwrights, clockmakers, and so on,” which depend only on manipulations of grosser structures of matter.¹¹⁸

This “true anatomy” depends, in turn, on a new notion of “bodies.” Trusting that the species we ordinarily find in nature are ultimate and believing that the particulars of our experience are substances with specific natures, the old natural histories strove for a more adequate and compendious knowledge of beings in their kinds. Its aims and methods make perfect sense if you assume the metaphysics guiding them. Bacon’s novel goal and his new methodological prescriptions grow out of his rejection of the old metaphysics. There is, he says, “little point in the abundant wealth we find in natural histories of descriptions and pictures of species, and the ingenuity lavished on their differences.”¹¹⁹ His new natural history is not “for the sake of knowledge of things themselves” because the beings we meet with in ordinary experience are not ultimate, only nature’s “particular and special habits” and “natures concrete or bound together and embodied in a structure.” He rejects Aristotle’s arbitrary distinction between the natural and the non-natural, including in his *natural* history a history of *pretergenerations* and *arts*.¹²⁰ Monstrosities and artifacts can show us a side of nature that we would never see if we stuck to the “well-trodden and common ways

¹¹⁶ *PAH* §5 (*OFB* XI, 463).

¹¹⁷ *PAH* §5 (*OFB* XI, 463).

¹¹⁸ *PAH* §5 (*OFB* XI, 463).

¹¹⁹ *PAH* §3 (*OFB* XI, 457).

¹²⁰ *PAH* §1 (*OFB* XI, 455).

of nature.” We cannot explain monsters and artifacts as Aristotle explained natural beings, by invoking a specific nature. Instead, we ought in each case to investigate a being’s *beginnings*, *parts*, and *dynamic processes* rather than its *telos*, its principle of *wholeness*, and its *perfection* or *actuality*. By anatomizing bodies natural, preternatural, and artificial, we will discover *latent schematisms* and *latent processes*—structures and motions of subsensible parts—more general than the species-specific forms or natures that Aristotle supposed.

But another kind of natural history is necessary if we hope to discover those “simple natures” and the “forms” or “general and fundamental laws” that are “the things in nature which are constant, eternal, and catholic” and the real object of Bacon’s science.¹²¹ “Now I do not just bring out a history of bodies,” Bacon told us in *Distributio operis*, “but I thought that I should also put my efforts into a separate history of those very virtues which (I say) can be regarded as cardinal in nature and which clearly constitute the primordia of nature and, indeed, the primary passions and desires of matter, viz. *Dense, Rare, Hot, Cold, Consistent, Fluid, Heavy, Light*, and quite a few others besides.”¹²² This was no idle recommendation. In fact, Bacon spent considerable effort, especially in his last years, compiling, among other works, his *Historia densi & rari* and his *Historia gravis et levis*.¹²³

Guided by Bacon’s anticipations, these histories of simple natures repurpose and reorganize the histories of natural, preternatural, or artificial bodies, transforming those relatively raw materials into matter suitable for his new form of induction. That repurposing is exactly what Bacon exhibits in his exemplary investigation of the form of heat in *Novum organum* Book II. He first draws up a

¹²¹ NO II §5 (OFB XI, 205-09). In *DGI*, Bacon declines to classify inquiries into simple natures and motions as natural histories. “I shall deal with the history of these virtues [“those Virtues which may be reckoned as Cardinal and Catholic in nature”] and motions, and the way of putting it together, after I have finished explaining that threefold partition of *Generations*, *Pretergenerations* and *Arts*. For I have not, of course, included it within that threefold partition of mine, because it is not properly history but a middle term, so to speak, between history and philosophy” (OFB VI, 109-11). Here again we see the ambiguous meeting point between sense or experience and reason.

¹²² *DO* (OFB XI, 39).

¹²³ For *HDR*, see OFB XIII. For *HGL*, see OFB XII.

table of presence, basically a list of many different instances of heat. Each of those instances would have first been cataloged in a history of nature in course, frustrated, or vexed. Some instances, for example, would have been gathered originally into a history of the heavens; some phenomena would have to be imported from a history of the air. Some instances are organic, cataloged first in any number of histories of animal and plant species. The heat of manure, however, might have to be culled from a history of agriculture. The would-be interpreter of nature combs through all available histories to gather instances of whichever cardinal virtue he is investigating. That drawing together of disparate instances is a first kind of order reason imposes on the phenomena. Nature itself does not suggest that the heat of the sun offers any clue about the heat of a fire. Much less does it suggest any useful likeness between the sun's heat and the heat of an animal's body. The *tables of absence* and *tables of degree* allow reason to impose a second and higher kind of order on experience, one suggested by the form of eliminative induction Bacon wants to practice.

So while Bacon's natural history may appear to be organized according to our pre-philosophical experience of the world articulated into kinds or the natural-philosophical organization of those beings into their proper places, really it is organized according to Bacon's own anticipation of the underlying nature of things, especially his anticipation about the primacy of sub-sensible structure and motion and his new idea of beings as stable but contingent conjunctions of simple natures or cardinal virtues. While the new natural history must begin with the ordinary experience of substantial beings and natural kinds, his anticipations artificially reshape those experiences.

It is Bacon's anticipations, not nature itself, that recommend to us a study of nature's cardinal virtues. Such anticipations, because they run ahead of experience, must be handled cautiously and kept in their place. Experience must be allowed to play a veridical role, functioning as a check on reason's anticipations. The list of simple natures, as Lisa Jardine notes, is not forever

fixed: “Bacon several times suggests that at successive stages during the progress toward the discovery of Forms the investigator will be able to emend his original list of simple natures and simple motions.”¹²⁴ About the ultimacy of those cardinal virtues, Bacon is (as we should expect) carefully agnostic. They *can be regarded* by reason as the “eternal and immutable” elements from which all concrete bodies are composed.¹²⁵ Reason’s anticipations are experience’s indispensable guide, but they cannot finally or fully determine experience. Rather, those anticipations are meant to lead to experiences that could more adequately determine reason.

Experience also has a role in generating reason’s projections. To see how experience guides the rational anticipations that guide experience, we might ask, for example, how Bacon comes up with his list of simple natures. Jardine points to Bacon’s “finite *a priori* list of simple natures” and his *a priori* classification of simple motions. Surely, though, Bacon’s list has some basis in experience. She also describes those simple natures as “familiar pairs of axiological antitheses which Bacon acknowledges are derived from earlier speculative systems.”¹²⁶ This origin story fits neatly with Rees’s account of Bacon’s “eclectic” speculative philosophy, an original system cobbled together from bits borrowed from ancient philosophy and pieces appropriated from the alchemists. Without doubt, Jardine’s and Rees’s account is at least partially right, but perhaps for a surprising reason. Many of those pairs—e.g., hot and cold, heavy and light—are the distinctions we readily make in our everyday experience, distinctions that any natural philosophy must account for. Bacon rejects Aristotle’s explanation in terms of substances and their accidents, insisting instead on a metaphysical picture that privileges those “accidental” qualities above the “substances” that are, perhaps, merely temporary arrays or conjunctions of those more fundamental simple natures. In that case, Bacon’s *a*

¹²⁴ Lisa Jardine, “*Experientia literata* or *Novum Organum*?: The Dilemma of Bacon’s Scientific Method,” 52, n. 24.

¹²⁵ *NO* II §9 (*OFB* XI, 215).

¹²⁶ Lisa Jardine, “*Experientia literata* or *Novum Organum*?: The Dilemma of Bacon’s Scientific Method,” 52.

priori list is not *a priori* after all. Neither is it at bottom eclectic borrowing. They are the distinctions that show up in our ordinary experience of nature in its ordinary course modified by Bacon's dialogical critique of Aristotelian science. Bacon's natural histories, then, are neither stockpiles of theory-free experience nor free rational constructions, but ordinary experience artificially transformed.

2.9 Literate Experience

We can turn now to the second help or aid Bacon contrives for gathering experiences fit for his new science. Like natural history, *experientia literata*—literate experience—offers a reason-guided refinement and expansion of ordinary experience. Indeed, it can be hard to tease Baconian natural history and *experientia literata* apart. Graham Rees, for example, lumps them together. “Natural history,” he says, “gives rise to a low-level, rule-of-thumb kind of operative knowledge called *experientia literata*.”¹²⁷ Bacon himself fails to distinguish between the two in *Distributio operis*. He calls for a more subtle “class of experiments”—what he elsewhere calls *experientia literata*—emphasizing the contrast between accidental or haphazard experience—what “we just bump into”—with the more purposeful and deliberate experiments that lead by “a certain and direct road” to the “discovery of causes” and the “fundamental elements” of nature.¹²⁸ Only someone searching for the kinds of causes and simple natures Bacon expects to find would seek out experiences of the sort he describes. Again, Bacon's anticipations serve as the guide.

¹²⁷ Rees, Introduction to *OFB* XIII, xxxvi.

¹²⁸ *DO* (*OFB* XI, 41).

Where natural history is, for the most part, the well-organized stockpile of philosophical material, *experientia literata* is the general set of practices or strategies to expand or extend experience, a kind of experience-generating engine. In *Novum organum* I, Bacon clearly views these strategies as a step beyond natural history. “[W]e must not only seek and get a greater abundance of experiments, an abundance of a kind different from that made hitherto,” he says; “we must also bring in a quite different method [*Methodus planè alia*], order and process for keeping experience going, and advancing it.”¹²⁹ He again contrasts this methodical experience to “unguided” or “wandering” experience [*vaga enim Experientia*]. *Experientia literata* is reason-guided or methodically-generated experience shaped by Bacon’s new science and his anticipations of nature.

Experientia literata and Bacon’s new inductive method are so closely related that, in the *Advancement*, *experientia literata* is “but a degree and rudiment” of the method.¹³⁰ Much later, in *De augmentis*, *experientia literata* is not “an art or a part of philosophy, but rather a kind of sagacity” that comprises “the methods of experimenting.” It “proceeds from one experiment to another” without ever ascending, as does the method proper, “from experiments to axioms” of greater generality.¹³¹ Bacon does not mean to distance these “methods of experimenting” from the methodical induction, but only to distinguish between procedures which ascend to axioms and those which, like *experientia literata* and natural history, stay on the level of particulars. So *experientia literata* is not identical with method nor even a “rudiment” of it, but rather a method or strategy guiding experience answering to the better-known method guiding reason.

¹²⁹ NO I §100 (OFB XI, 158-59).

¹³⁰ AL II (OFB IV, 111).

¹³¹ DAS V.2 (SEH IV, 413).

Such methodically-generated experience supplies both the material for methodical induction and what we just saw Rees describe as low-level, rule-of-thumb operative knowledge.¹³² The material for induction most likely belongs, like the material gathered in the natural history, to the Instauration's third part. Lisa Jardine lodges the latter, non-methodical generalizations achieved by *experientia literata* in the fifth part of Bacon's Instauration—the provisional conclusions or anticipations of the philosophy to come.

What Jardine and others miss is that, while *experientia literata* may yield anticipations, those experimental strategies are also shaped by another and more fundamental kind of anticipation. “A man,” Bacon says, “may proceed on his path in three ways.” He may, like a blind and wandering empiric, “grope his way for himself in the dark.” Or he may, using the strategies Bacon groups together as *experientia literata*, “be led by the hand of another, without himself seeing anything.” Only the true interpreter of nature can guide his own steps by first setting up a light. The light by which the interpreter of nature guides his steps are, first, that idea of nature he achieves through his critical program and, second, those axioms he discovers through the methodical use of his reason, for “axioms themselves suggest new experiments.”¹³³ Because *experientia literata* need not be conscious of the idea of nature which governs it, and because it never ascends to axioms, it must be guided “by the hand of another.” Experience itself—ordinary or non-methodical experience—must be disciplined by a set of strategies imposed from “outside” experience itself.

We can distinguish, then, between two types of anticipations: a first type *guiding* Bacon's experimental strategies and a second type *resulting* from those experiments. Jardine and Rees focus on the second, *resulting* type, but it is that first, *guiding* type that interests us here.

¹³² See *DAS* V.2 (*SEH* IV, 417).

¹³³ *DAS* V.2 (*SEH* IV, 413).

A closer look at those experimental strategies—Bacon identifies eight—reveals how they are shaped by Bacon’s guiding anticipations of nature.¹³⁴ Variation of experiment, the first strategy, extends experience by varying the matter, efficient cause, or quantities involved in the experiment. The strategy makes sense only if one makes certain assumptions about the kinds of causes and conditions that factor in the production of phenomena and other assumptions about how experience of varied causes and conditions will yield knowledge. Seeing such variations in a being’s accidental properties is of no help if scientific knowledge is knowledge of a being’s essential properties. If there is no real distinction between essential and accidental qualities, however, and if natural beings are thought of as conjunctions of co-equal qualities, then variations in any property—“accidental” or “essential”—will potentially be of interest. Similarly, if one thought that scientific knowledge is knowledge of a being’s nature, where *nature* means something like *an internal principle or cause of motion*, then varying the efficient cause—realizing by artificial means a product normally produced by nature—could not lead to scientific knowledge.

Other *experientia literata* strategies depend on similar assumptions. For instance, Bacon’s third experimental strategy urges a translation between art and nature that would never occur to a natural philosopher who insists that internal, natural formal causes are fundamentally different from external, artificial formal causes, but it makes perfect sense to a natural philosopher who denied, in advance, any deep significance to the distinction between nature and art. Likewise, Aristotle could never have recommended or put much stock in “Experiments of Chance”—Bacon’s eighth strategy. But if we believe that nature is not exhausted by what happens always or for the most part—if we suspect that “the *magnalia* of nature generally lie out of the common roads and beaten paths,” that nature as it ordinarily appears to us is no good guide to nature as it really is, and that the discovery of

¹³⁴ Bacon catalogs *experientia literata* strategies at *DAS* V.2 (*SEH* IV, 413-21).

such wonders “is one of the best ways” to “shake out the folds of nature”— we should put some effort into such out-of-the-road trials.¹³⁵ These experimental strategies are not metaphysically naive or indifferent, then. A set of metaphysical commitments—anticipations about the nature of nature—guide them.

We can also trace a strong connection between these experimental strategies and Bacon’s own method of eliminative induction.¹³⁶ By varying the matter, efficient cause, and quantity in an experiment, the natural philosopher gathers for himself a wealth of examples for his Tables of Presence. Another strategy, inversion of experiment, “takes place when trial is made of the contrary of that which has been proved by the experiment.”¹³⁷ Burning-glasses increase heat. Do they also increase cold? White surfaces reflect the sun’s rays; black surfaces collect them. Does the opposite hold for shadows? These strategic inversions help generate the sort of instances needed for Tables of Absence. Finally, the kinds of extreme or limit cases one needs to compile Tables of Degree are well provided by the fourth *experientia literata* strategy, the compulsion of experiment. Bacon concedes that such experiments “commonly fall outside the limits of learned experience [*experientia literata*], and are rather referred to causes, and axioms, and the New Organon. For wherever a case is established of negation, privation, or exclusion, there is some light given towards the invention of Forms.”¹³⁸ Thus these three experimental strategies aim to generate just the kind of experience Bacon will need to carry out his inductions, with the third strategy straddling the very boundary between experience and reason, particulars and axioms. So the method, too, is a kind of anticipation directing the kinds of experience we should strategically seek.

¹³⁵ *DAS* V.2 (*SEH* IV, 420).

¹³⁶ Jardine makes the same point at “*Experientia literata* or *Novum Organum*?” 56. She, however, sees *experientia literata* and *novum organum* as two separate programs, and so does not attempt to explain the obvious connections between the pre-methodical experimental strategies of *experientia literata* and the demands of methodical induction.

¹³⁷ *DAS* V.2 (*SEH* IV, 418).

¹³⁸ *DAS* V.2 (*SEH* IV, 419).

Sometimes, ordinary experience itself is perplexing or aporetic. We experience a contradiction in our various anticipations, a new experience calls those old anticipations into question, or we become aware of a hole in our picture of the world. But problems that surface in ordinary experience often cannot be solved within the limits of ordinary experience. We do not ordinarily experience heat from the moon, planets, or stars. Grafting is artful meddling in nature, not nature in its ordinary course. So ordinary experience of nature is neither the motivation for asking these questions nor the judge competent to decide them. We must strategically seek out or arrange experiences that will drive nature into the open. To do so, we must first transform the questions nature puts to us into a set of questions we can put to nature.

Or our questions may seek out solutions to some practical problem. “Let men only watch and keep their eyes continually turned to the nature of things on one side,” Bacon counsels, “and to the uses of man on the other.” Our interests and needs put us in the way of insights we might miss if we were disinterested spectators merely observing nature. We discover more when we are trying to solve a problem or get something done. Experience here is guided by our practical needs rather than our speculative curiosity. Practical reason—prudence paired with know-how—purposefully curates and directs our experience so we might satisfy our wants.

Experientia literata strategies structure our questioning and generate experience even when we are unmoved by practical need or a desire to know. Often these questions take shape around guesses about what nature’s answers will be. But the sort of guiding anticipations I’ve been discussing can only direct the experimenter’s work in a general way. The experimenter’s decisions about which experimental procedures to try seem to depend more on anticipations of the second, “resulting” kind, anticipations carried over from the old science, or anticipations grounded in ordinary experience. There is therefore a special role for “experimental sagacity” gained from previous

experimental work. We manufacture paper from linen. The experimenter's previous experience of silk and its uses suggests to him the possibility that we might also make paper from silk.

Experience—both non-methodical experience and experience generated by *experientia literata* strategies—can make one experimenter better than another precisely because more experience and greater ingenuity lead to better anticipations. Having used a burning glass to collect the sun's rays, he can wonder whether it is possible to also collect rays of the moon or other luminous heavenly bodies. Having grafted fruit trees, he can better imagine how wild trees might also be grafted. A seasoned experimenter has ready-to-hand more varied experiences from which he can draw analogies and correspondences. But experience itself is always particular and parochial. Reason, with the help of artificial experience, must pose the questions and suggest the conditions under which a suitable experience of nature can make an answer. Nature as we ordinarily experience it is mute. By reason's intervention, experience can be made articulate or “literate” and so interpretable.

The experimenter's sagacity thus amounts to a knack for making nature speak combined with the humility to listen to what nature says. For example, when Bacon asks whether ‘opaque’ heat—heat unaccompanied by light—can, like radiant heats, be increased by a burning glass, he is really asking whether light (which is absent in the case of opaque heats and present in the case of radiant heats) has “something to do with it.”¹³⁹ The experiment is suggested by a rough and tentative explanation of the phenomena and is meant, in a way, to test the truth of that explanation. Likewise, Bacon's attempt to collect heat from the moon's rays is meant to test an unstated hypothesis, something like: all luminous heavenly bodies transmit some degree of heat. The two experiments are connected by a similar explanation linking light and heat. The results of one experiment will inform the experimenter's interpretation of the other and may suggest subsequent experiments. Reason

¹³⁹ *DAS* V.2 (*SEH* IV, 414).

devises such series of methodical experience in order to wrest from nature causes and correspondences of which ordinary experience gives no hint.

Are these guesses or anticipations really *hypotheses*? Not really. Instead of putting forward an explanation to be directly tested, they direct the experimenter's attention, raise questions, and try to coax nature into revealing itself.¹⁴⁰ The conjectural connection between light and heat, for example, is not the kind of well-developed, falsifiable hypothesis we tend to think scientists are in the business of formulating and testing. At this early, fact-gathering stage, Bacon only guesses that heat and light have "something to do" with each other, a link suggested by their co-occurrence rather than any detailed explanatory theory. *Experientia literata* are better thought of as general-purpose strategies for generating experience when no specific theory is available to guide the investigation.

In the early stages of natural-philosophical inquiry, experience can be guided only by a general idea of nature, the anticipations of ordinary experience, and the experimenter's more diligent experience. Novel experiences generated in those early stages ground new anticipations that guide later experimental work. But even these more mature anticipations fall short of theory-testing hypotheses. Bacon's *crucial instances*, those "*Decisive and Judicial Instances*" that seem to answer most closely to our notion of an experimental test of a falsifiable hypotheses, come much later in the inductive process and are besides just one of twenty-seven different kinds of instances with special powers.¹⁴¹ Bacon's list of instances with special powers is an extraordinarily detailed account of the various ways that experience can contribute to knowledge.¹⁴² Not all experience carries the same weight, and not all experience is useful in the same way. Some experience is veridical or evidential;

¹⁴⁰ In scattered texts, Bacon proposes a handful of experiments designed, it seems, to undercut certain Aristotelian doctrines. But they are the exception, and Bacon's interest in refuting them serves his critical program more than his constructive scientific program. See Graham Rees's helpful discussion and references at *OFB* XII, xxxii.

¹⁴¹ *NO* II §36 (*OFB* XI, 319).

¹⁴² Bacon catalogs the twenty-seven "instances with special powers" in *NO* II §§22-51.

some experience is valuable chiefly as a heuristic. Reason guides experience in many ways; many are the ways in which experience informs reason. Bacon gladly embraces them all.

Experience, if it is to reveal nature as it really is and give us power over it, must be guided by reason's questions. Reason's questions, in turn, are shaped by reason's own anticipations of the world, both those legitimate "guiding" anticipations and the "resulting" anticipations generated by prior experimental work. But in laying out his experimental strategies, Bacon also takes precautions against the illegitimate use of anticipations. For example, men "postulate and suppose" with "a kind of mathematical certainty" that as the quantity or mass of body is increased or multiplied, its "power and virtue is increased or multiplied proportionately." This is the kind of willful anticipation Bacon wants excised, the kind that dictates to nature rather than teasing out its secrets. The problem is not that reason anticipates nature, or even that the anticipation it makes is a general and well-defined claim about the world, but that the anticipation is dogmatic. It is put forward as a settled fact about nature rather than a leading question that nature itself must answer. If anyone bothered to check it experimentally, he would see that the rate of fall of a heavy body, for example, is not proportionately increased with its weight or, for instance, that the melting power that sulphur exercises on steel is not proportionately increased as the quantity of sulphur increases. "As a rule then," Bacon concludes, "it will not be safe to rely on any experiment in nature, unless it has been tried both in greater and lesser quantities."¹⁴³ Reason's anticipations ought not be trusted until experientially verified.

This marriage of reason and experience reconciles philosophy's skeptical and dogmatic proclivities. The dogmatists were forever enthralled to their anticipations because they mistook them as conclusions rather than tentative projections. If the dogmatists err in supposing too much, the

¹⁴³ *DAS* V.2 (*SEH* IV, 415).

skeptics err in not supposing enough. They could not escape their doubts because, guarding against the dogmatists' unfounded certainty, they were unwilling to hazard the kind of guesses that could usefully guide experience. These skeptics avoid the dogmatists' undeserved certainty, but fall prey to their own fastidiousness, waiting in vain for ordinary experience to supply some indubitable truth.

As I said above, Bacon's legitimate anticipations are neither radically skeptical nor doggedly dogmatic, but rather dogmatic projections—guesses that run ahead of experience—handled skeptically, by submitting them to testing before they are accepted or denied. A legitimate anticipation is a leading question reason puts to nature, and that only a suitably arranged, “artificial” experience of nature can answer.

I will mention only more piece of evidence about the role of anticipations in a process of discovery. After cataloging the experimental strategies, Bacon turns, in the next chapter of *De augmentis*, to the invention of arguments. Unlike the experimental strategies, which discover previously unknown knowledge, the invention of arguments only recalls and makes ready knowledge already laid up in the mind. Still, his discussion of the orator's use of topics as an aid to invention is relevant, for topics not only serve

to prompt and suggest what we should affirm and assert, but also what we should inquire or ask. For a faculty of wise interrogating is half a knowledge. For Plato says well, ‘whosoever seeks a thing, knows that which he seeks for in a general notion; else how shall he know it when he has found it?’ And therefore the fuller and more certain our anticipation is, the more direct and compendious is our search.¹⁴⁴

Anticipations aid the orator's memory in just the way that anticipations aid the natural philosopher's experimental discovery. Bacon himself says so: “The same places therefore which will help us to shake out the folds of the intellect within us, and to draw forth the knowledge stored therein, will

¹⁴⁴ *DAS* V.3 (*SEH* IV, 423).

also help us to gain knowledge from without.”¹⁴⁵ Just as our anticipations, grounded in our experience, allow us to question knowledgeable men and knowledgeable books “wisely and to the purpose,” our anticipations allow us to put the question to nature more wisely and to the purpose. Whether we mean to question men or books or nature, we must first know what to ask. We necessarily anticipate the knowledge we seek. Otherwise, the search would be blind and wandering and most often fruitless. Yet to mistake those anticipations for conclusions would deafen us to the knowledge to be discovered in those wise men, wise authors, and nature itself. And with greater experience, we learn to ask better questions. For “when a man first enters into the pursuit of any knowledge, he may have some useful precepts of invention; but when he has made further advances in that knowledge, he may and ought to devise new precepts of invention, to lead him better to that which lies beyond.”¹⁴⁶ The search for knowledge is like “journeying in a champaign country; for when we have gone some part of our way, we are not only nearer to our journey’s end, but we can likewise see better that part of the way which remains.”¹⁴⁷ As Bacon said in another place, the art of discovery grows with discovery.¹⁴⁸

2.10 Experiments and the Victory of Art over Nature

Natural history records experiments and *experientia literata* recommends a variety of experimental strategies, but we have not yet generally described Baconian experiments or teased out what Bacon’s use of experiments tells us about his idea of nature, nature’s relation to human art, and the need to make experience more active and interventionist.

¹⁴⁵ *DAS* V.3 (*SEH* IV, 423).

¹⁴⁶ *DAS* V.3 (*SEH* IV, 424).

¹⁴⁷ *DAS* V.3 (*SEH* IV, 424).

¹⁴⁸ *NO* I §130 (*OFB* XI, 197).

As we have seen, experiment is experience “deliberately sought out,” experience disciplined, “marshalled and well-grounded.” Mere experience, by contrast, is undisciplined or accidental, “just the groping of benighted men trying steadfastly to feel their way to the right road by luck.” Their steadfastness only dooms them to draw ever farther and hopelessly into nature’s labyrinth. What they lack is some grounding and direction, a light to guide their steps and “order and digest” the otherwise “topsy-turvy or haphazard” swirl of experience.¹⁴⁹ They lack the rational anticipations—including the right “theory or art”—that set experience on the right road and provide the necessary light.¹⁵⁰ In short, experiment is reason-guided experience, the legitimate marriage of reason and experience.

Experiment is also Bacon’s word for experience that surpasses our ordinary experience of nature in its ordinary course. Experiment surpasses ordinary experience in two ways, first by vexing nature out of its ordinary course and, second, by using ordinary experience as a sign pointing to what cannot be directly experienced.

We ordinarily experience nature in its ordinary course, “free and unconstrained.” Experiments, in Bacon’s sense, are purposeful attempts to “restrain” and “vex” nature, to “squeeze” and “mould” it and force it by human agency into a new condition. In experiments, as in all things artificial, “nature is held in subjugation by the empire of man.” Art and experiment show us nature in “an entirely new guise” and open up “a kind of alternate universe or theatre of things.”¹⁵¹ Proteus is one of Bacon’s most evocative images of nature constrained by art. The old poets said that anyone wanting help from Proteus had “first to secure his hands with handcuffs, and then to bind him with chains.” So bound, Proteus, “in order to get free, would turn himself into all manner of strange

¹⁴⁹ *NO I* §82 (*OFB XI*, 129-131).

¹⁵⁰ *NO I* §73 (*OFB XI*, 117).

¹⁵¹ *Preparative to Natural History* §1 (*OFB XI*, 455).

shapes—fire, water, wild beasts, &c., till at last he returned to his original shape.” Likewise “if any skilful Servant of Nature” wishes to experience or bring about something other than “the universe with its several species according to their ordinary frame and structure,” he “shall bring force to bear on matter, and shall vex it and drive it to extremities as if with the purpose of reducing it to nothing” so that matter, in order to escape these torments, will “turn and transform itself into strange shapes, passing from one change to another till it has gone through the whole circle and finished the period; when, if the force be continued, it returns at last to itself.”¹⁵² By binding and constraining nature, the experimenter brings about those “strange shapes,” true *nova* that might never have come about without man’s intervention.

On Thomas Kuhn’s telling, perhaps the greatest and most lasting achievement of “Baconian” science is the creation of novel objects and the novel sciences that study them. The scientific study of magnetism, electricity, and heat, for example, was made possible only by the intervention of instruments that could reliably produce and measure the relevant phenomena.¹⁵³ Serious experimental scientists like Gilbert, Hooke, and Boyle had first to bring into being the very objects and phenomena that they and later scientists would try to explain. We tend not to think of these objects of scientific study as *artifacts*, yet without phenomena-generating interventions, there could be nothing like our modern physics, chemistry, or biology. Think of the subatomic particles that we “observe” only by smashing atoms together in massive and massively powerful particle accelerators. Technetium (Tc, atomic number: 43) exists only in laboratories and, so far as we know, certain types of distant stars. There is maybe one pound of Promethium in the whole of Earth’s crust, but no one “experienced” any until it was created, in Tennessee, in 1945, by irradiating

¹⁵² *DSV* (*SEH* VI, 725-726).

¹⁵³ See Thomas Kuhn, “Mathematical vs. Experimental Traditions in the Development of Physical Science,” *Journal of Interdisciplinary History* 7, no. 1 (Summer, 1976), 14-15. See also Ian Hacking, *Representing and Intervening: Introductory Topics in the Philosophy of Natural Science*, ch. 13.

uranium. Some plant and animal species exist only because of human domestication or hybridization, and gene editing will likely lead to more radically artificial speciation. Interventions on this scale were impossible in Bacon's day, of course, but they were not unthinkable. A Father of Salomon's House describes the "parks and inclosures of all sorts of beasts and birds" which they use "for dissections and trials" and sometimes

by art likewise, we make them greater or taller than their kind is; and contrariwise dwarf them, and stay their growth; we make them more fruitful and bearing than their kind is; and contrariwise barren and not generative. Also we make them differ in colour, shape, activity, many ways. We find means to make commixtures and copulations of different kinds; which have produced many new kinds, and them not barren, as the general opinion is.¹⁵⁴

These "new kinds" came to be by art, but they are not barren as the "general opinion" about the difference between art and nature would seem to require. All products of art are barren, according to general opinion, insofar as they are artificial. You cannot plant a bed and expect to grow more beds in the way you can plant acorns to get more oak trees.¹⁵⁵ An artificial species capable of reproducing itself blurs the supposed boundary between things natural and things artificial and with it the old science of nature grounded in that distinction.

Bacon thinks of these *nova* as long-latent *natural* possibilities, secrets concealed in "nature's recesses" uncovered by art or chance. We lucked into the discoveries of gunpowder, silk, and the mariner's compass because nature's possibilities "no doubt come to light some day after the lapse of long ages." But we need not wait. If passive experience gives way to active experiment, nature's secrets "can be speedily, suddenly, and simultaneously anticipated and made manifest."¹⁵⁶ Experiment does not produce something non-natural; it shakes out nature's folds and draws out its hidden parts. Art's contrivances, in fact, reveal nature more fully than even the most diligent

¹⁵⁴ *NA* (*SEH* III, 159).

¹⁵⁵ See Aristotle, *Physics* II 193a13-21.

¹⁵⁶ *NO* I §109 (*OFB* XI, 167-169).

observation of nature in course, “For just as in affairs of state we see a man’s mettle and the secret sense of his soul and affections better when he is under pressure than at other times, so nature’s secrets betray themselves more through the vexations of art than they do in their usual course.”¹⁵⁷

Passive experience must patiently and attentively wait; reason itself can only conjecture; but reason-guided experience draws nature out and purposefully realizes nature’s hidden possibilities.

Guided by reason, experience also learns to take what *could be* and what *could never be* as its objects. Ordinary experience focuses our attention on what is or has been actual, those beings and states of affairs we have perceived or are perceiving. What *could be* is a matter for practical, not theoretical reason. But artfully contrived or chance deviations from nature’s habitual course should lead “the intellect from what does exist to what may exist.”¹⁵⁸ The focus shifts from experience of what is now to what will or might be in the future. And properly arranged experiments also target the strangest object of science, what is *impossible*, the counter-factual. Bacon’s science, both in its theoretical and practical goals, gives a new emphasis to nature’s potentialities and so, too, the limits of what is possible.

Experiment also surpasses ordinary experience by contriving ways to use the sensible and complex as signs of the imperceptible and simple. Nature’s more subtle parts are in themselves imperceptible; our senses are dull, inadequate, and unreliable.¹⁵⁹ Telescopes, microscopes, and other instruments can refine and extend the range of sense; furnaces can analyze the compounds we normally experience into the elements we never immediately perceive. But Bacon aids the sense “not so much with instruments as by experiments. For the subtlety of experiments is far greater than that

¹⁵⁷ NO I §98 (OFB XI, 157).

¹⁵⁸ NO II §30 (OFB XI, 301).

¹⁵⁹ NO I §50 (OFB XI, 87).

of the sense itself, even when it has precise instruments to help it.”¹⁶⁰ Instruments augment the sense to make mediately visible the microscopically small or the telescopically distant. Experiments, on the other hand, allow our more ordinary experience to function as a sign of the imperceptibly subtle parts of nature. The immediately perceptible can be made to point, for example, to the “more subtle metaschematism in the parts of grosser bodies” that we never directly perceive, even with the help of instruments, and the “local motion *per minima*” that we ordinarily experience as “alteration.”¹⁶¹ Or we can learn to take our ordinary experience of species-specific beings as pointers to the species-neutral simple natures that make them up. Experience recapitulated in this way becomes pregnant with other significant pointers. “[N]o one successfully investigates the nature of anything just by looking at the thing itself,” Bacon admonishes. “[T]he inquiry should be extended to things beyond it,” so long as the extension is made “duly and systematically,” as reason-guided experiment counsels.¹⁶² For “the same nature, which seems to be hidden and secret in some things, is manifest and almost palpable in others.”¹⁶³ For example, the heat of the sun points to the heat of a flame or the heat in animal bodies. The ordinary experience of a world articulated into natural kinds discourages such analogizing and tends to narrowly constrain inquiry along common but merely-conventional or non-ultimate dividing lines.

Bacon sets little store in the immediate perception of the sense, for “all truer interpretation of nature is accomplished by means of instances, and apt and appropriate experiments, where the

¹⁶⁰ *DO* (*OFB* XI, 33-35). See also *DAS* V.2 (*SEH* IV, 412): “But their great error was, that they laid the blame upon the perceptions of the sense, and thereby pulled up the sciences by the very roots. Now the senses, though they often deceive us or fail us, may nevertheless, with diligent assistance, suffice for knowledge; and that by the help not so much of instruments (though these too are of some use) as of those experiments which produce and urge things which are too subtle for the sense to some effect comprehensible by the sense.”

¹⁶¹ *NO* I §50 (*OFB* XI, 87).

¹⁶² *NO* I §70 (*OFB* XI, 111-113).

¹⁶³ *NO* I §88 (*OFB* XI, 143).

sense judges only the experiment while the experiment judges nature and the thing itself.”¹⁶⁴ If reason is relegated to a wholly passive role, “reflection . . . almost stops where sight does.”¹⁶⁵ The unaided “testimony and information of the sense”—ordinary experience—“is always made to the measure of man and not the universe,” and so “it is a very great mistake to say that the sense is the measure of things.”¹⁶⁶ But reason can go beyond ordinary experience by means of experiments: artful “arrangements” we make for “generating [*accensionem*]” the “light of nature” and “letting it in [*immissionem*].”¹⁶⁷ Reason must first set up the situation that allows one state of affairs to signify another and then act as interpreter of the signs it contrived. Experiment institutes a divided reign or, better, a system of checks and balances: reason must both submit to and test sense; sense must both submit to and test reason. Experiment is thus the sacramental binding of experience and reason, the rite Bacon performs as “high priest of the sense” and “learned interpreter of [the sense’s] oracles.”¹⁶⁸ This new attitude to nature—call it *active receptivity*—requires a new self-mastery whereby reason and experience each submit willingly to the other. Reason-guided experiment—reason anticipating experience, experience constraining reason—can, Bacon gambles, teach us to see nature *ex analogia universi*.

We take for granted the legitimacy of Baconian experiments in natural science, but not every idea of nature is as congenial to experiment. It is “easy to forget,” J. E. Tiles reminds us, “that Bacon’s policy is not the only or the most obviously sensible way to deal with nature” since “surely interference”—vexing nature out of its ordinary course—“is as likely as not to obscure the natural

¹⁶⁴ NO I §50 (OFB XI, 87).

¹⁶⁵ NO I §50 (OFB XI, 87).

¹⁶⁶ DO (OFB XI, 33). See also NO I §41 (OFB XI, 79-81).

¹⁶⁷ DO (OFB XI, 35).

¹⁶⁸ DO (OFB XI, 35).

behaviour of phenomena.”¹⁶⁹ Experience made active and given license to intervene in nature is no longer the old philosophers’ disinterested on-looking, and it is worth drawing out the differences.¹⁷⁰

Philosophers, Pythagoras said, were like the spectators at the games. Unlike the athletes, who came to win glory, or the merchants, who came to hock their wares, these observers came out of curiosity, to see and to know. Pythagoras’s image distinguishes these types of men according to the goods they pursue. But in the case of philosophy, the image also identifies the appropriate means: one seeks knowledge through disinterested and passive on-looking. To take action or a rooting interest would spoil the purity and nobility of the philosophical life and distort the search for knowledge of nature. So understood, philosophy is not practical, is not an art, but it presupposes a relation between art and nature. For both science and art, nature is the standard and the rule. The artisan imitates nature or completes what nature cannot complete itself; he aims to bring about what nature intends. Art presupposes the disinterested philosopher’s more comprehensive knowledge of nature’s ends, but therefore cannot really advance the search for such knowledge.

Convinced that art had nothing to teach us about nature, the old science relied, for the most part, on ordinary experience of nature in its ordinary course. Astronomy, statics, optics, mathematics, and harmonics—what Thomas Kuhn calls the “classical physical sciences”—were all, he says, “empirical rather than *a priori*,” but “their considerable ancient development required little refined observation and even less experiment. . . . [T]he data their development required were of a sort which everyday observation, sometimes modestly refined and systematized, could provide.”¹⁷¹ Not every ancient excluded every artificial extension of experience. Kuhn includes as instances of

¹⁶⁹ J. E. Tiles, “Experiment as Intervention,” 466.

¹⁷⁰ Graham Rees, too, sees in Bacon’s experimental vexations of nature an implicit denial of the adequacy for scientific knowledge of the Socratic-Aristotelian starting point in ordinary experience. See *OFB* XII, xxxii.

¹⁷¹ Thomas Kuhn, “Mathematical vs. Experimental Traditions in the Development of Physical Science,” *Journal of Interdisciplinary History* 7, no. 1 (Summer, 1976), 7.

“everyday observation,” for example, some “relatively accessible and mostly qualitative observations” of “mirrors and levers.” Still, the idea was, as Tiles puts it, “minimal interference.” As far as possible, nature should be left undisturbed. “The most which a respectful student . . . was expected to *do*, whether in thought or in deed,” Tiles explains, “was to arrange things so that the phenomena will be most readily manifest.”¹⁷² The student of nature can get himself a better seat, but must then limit himself to watching nature’s self-directing action unfold. Knowledge required a perfect passivity, to receive the world just as it is. So experiment—any artful binding or constraining of nature out of its ordinary course—can only show us art, not nature.¹⁷³

It is no accident, then, that Aristotle’s natural-scientific writings are filled with careful empirical observations but lack anything answering to Bacon’s interventional experiments. In *History of Animals*, for example, Aristotle describes in considerable detail the development of a chicken embryo.¹⁷⁴ The yolk forms and rises to the more pointed end of the egg; around the fourth day, the heart appears, no larger, at first, than a speck of blood. The embryo begins to differentiate; a head can be distinguished and in it, swollen eyes that gradually diminish in size and collapse. By the tenth day, all the chick’s parts are distinctly visible. Its head is still larger than its body and its eyes larger than its head. The eyes, if removed at this time, Aristotle reports, are found to be larger than beans, and black. Removing the embryo’s eyes must surely count as an intervention and perhaps even as a kind of experiment. So, too, the whole course of observation, made possible only by violently, unnaturally interrupting the embryo’s natural development, depends on human art, but human art here only makes visible what nature has already accomplished. Nature ends as soon as art intervenes,

¹⁷² J. E. Tiles, “Experiment as Intervention,” *British Journal for the Philosophy of Science* 44 (1993), 465.

¹⁷³ See Richard Kennington, “Bacon’s Ontology,” 47.

¹⁷⁴ Aristotle, *History of Animals* VI.3.

and it is only because nature's product is not wholly destroyed by art that the "experiment" can teach us anything about nature.

For many of the same reasons, chance events cannot teach us about nature. A featherless or two-headed chick tells us nothing about the nature of chickens because nature is a principle that acts always or for the most part. Things exist either by nature or art or chance, Aristotle said, and experience of what exists by art or chance does not reveal anything essential about nature or what exists by nature.

Still, Tiles argues, we could make room for Baconian experiments without abandoning Aristotle's idea of nature. "It would be quite possible," he says

for an Aristotelian to view the natural world not as a harmonious order where, typically, natural bodies manifest their natures, but as a great field of pent-up potential in which conditions for the full spontaneous development of a nature are rarely at hand and where the limited action managed by any one body forever limits the fulfillment of the natures of other bodies. Under his view the student of nature would have to intervene to create artificially the conditions under which a given nature could take its course. It would not be enough to collect observations about what does take place, it would need well established facts about what *would* take place *if* . . . , before the explanatory programme could get underway.¹⁷⁵

His is, I think, a fair description of Bacon's idea of nature and the science by which it could be known: a great field of pent-up potential we disclose by experimentally constituting conditional facts. We used to think of nature as what is manifest always or for the most part. We need only open our eyes to experience it. After the shift to the new "experimental outlook," we think of nature as having "hidden depths . . . of unrealized potential." To experience nature, we must first "bring [these hidden potentials] to the surface of actuality" through the "vexations of art." Accordingly, science must become less trusting and less complacent. Indeed, Tiles adds, "This picture of an Aristotelian with a less complacent outlook on the accessibility of the phenomena . . . is not unrecognizable as a

¹⁷⁵ Tiles, "Experiment as Intervention," 467.

portrait of Francis Bacon himself.”¹⁷⁶ The question is whether his description is still recognizably *Aristotelian*.

A satisfactory answer to this question will have to wait until the next chapter. There, I will show that Bacon’s understanding of *form* or *law*, his notion of a *being*, and his teaching about final causes in nature cannot be reconciled with Aristotle’s notion of *natures*—principles of the spontaneous self-development of *substantial* beings of a particular *kind*. But here we can take a first pass at the problem by thinking about the relation between art and nature.

The shift to an “experimental outlook,” Tiles claims, depends on two developments: a new goal for scientific inquiry, and a redrawn boundary between the natural and the artificial.¹⁷⁷ Although Tiles does not say so, the two are deeply connected. For Bacon, philosophy cannot afford to be disinterested nor art to be kept in nature’s leading strings. Man lost or never had a perfect mastery over nature. Expelled from the Garden, he must wrest his daily bread from disobliging nature. He constrains nature with arts and tools that lessen his burden and multiply his labor. Those practical vexations and the technologies that enable them are, in Bacon’s sense, *experiments*.

But as the Aristotelian and Scholastic traditions show, one need not think that nature is hostile or indifferent to man’s good to grant art an essential role in human flourishing. One only need think, as Aristotle and many others obviously did, that nature’s intentions can be frustrated and unfulfilled without art’s ministrations. In *De natura deorum*, Cicero gives Lucilius Balbus, the dialogue’s Stoic mouthpiece, a speech that, rightly excerpted, sounds thoroughly Baconian:

it is by the work, that is, by the hands, of men that a variety and abundance of food is also obtained. . . . We also, by the mastery we exercise, create a means of conveyance by four-footed creatures, whose speed and strength give speed and strength to our own. . . . we alone, by our knowledge of seamanship, possess control over the elements of sea and wind,

¹⁷⁶ Tiles, “Experiment as Intervention,” 467–468.

¹⁷⁷ Tiles, “Experiment as Intervention,” 468–69.

which nature has created full of turbulence, and we have the enjoyment and use of very many products of the sea. All dominion, too, over the resources of the earth belongs to man. We enjoy the mountains and the plains, the rivers and the lakes are ours, we sow the crops and trees, we give fertility to the land by conveying water to it, we confine the streams, we straighten or divert their course—in short, by means of our hands we endeavor to create in nature a kind of second nature.¹⁷⁸

Human art satisfies our needs and provides us our pleasures. “[I]t was through the application of the craftsman’s hand to what had been discovered by the intelligence and observed by the senses,”

Balbus says, “that we attained everything which enabled us to be sheltered, clothed, and preserved in safety, and to possess cities, walls, dwelling-places, and sanctuaries.”¹⁷⁹ Art gives us mastery over beasts, control over the elements, and dominion of the earth. Man, by his art, creates a “second nature.” Looked at in proper perspective, though, Balbus’s speech is anything but Baconian. The craftsman’s hands, Balbus says, were given to man by nature; “the very mind and intelligence of man, his reason, contrivance, and forethought, were the result of divine care.”¹⁸⁰ Balbus’s long speech, in fact, is meant to demonstrate that the world is so well and purposefully built that it must be the work of some good and intelligent creator who made it for the sake of gods and men. Art is just the peculiar way that nature provides for man.

So mastery had long been a goal of human art. Bacon’s innovation is to make art’s mastery of nature the goal of *science*. Our theoretical questions sometimes outpace our practical need. We try an experiment just because we want to know. Even then we can satisfy that desire only by artfully expanding experience with the help of the tools that make available or bring into being the very objects we aspire to know. The use of scientific instruments—microscopes, telescopes,

¹⁷⁸ Cicero, *De natura deorum* 2:60. Sophie Weeks quotes the same passage in her excellent essay, “Francis Bacon and the Art-Nature Distinction,” 128, contrasting Balbus’s more limited mastery with Bacon’s radical mastery by which man seeks to destroy nature in its ordinary course and wholly remake it. Her juxtaposition of the two accounts of mastery would have been deepened had she also noted that man’s artful mastery of nature is, for Balbus, an instance of nature’s teleological ordering.

¹⁷⁹ Cicero, *De natura deorum* 2:60.

¹⁸⁰ Cicero, *De natura deorum* 2:59.

thermometers, barometers, air pumps—increases rapidly in the half centuries before and after Bacon’s *Novum organum*. Those instruments created new phenomena and made possible more minute, more reaching, and more exacting observations. But the real advance in technology is Bacon’s *organon* itself. Science itself is a *techne*. Its goal, like any other *techne*, is mastery.

The artful and technical expansion of experience, the radical transformation of experience into a new *techne*, can in turn advance theoretical science. Because art is just nature remade, a different guise nature is made to take, those arts and tools can be put to theoretical ends. Each new shape we force nature to take offers possible insight into what lies beneath or behind those shows. A properly collected history of arts and inventions and the transformations they accomplish will greatly expand our power over nature, but they can also be made to testify about nature. Experiments can be light-bearing as well as fruit-bearing.¹⁸¹

Bacon’s conflation of art and science depends on a new notion of art, nature, and the relation between them. The *locus classicus* for Bacon’s opinion on the art-nature distinction is a passage in *Descriptio globi intellectualis*: “artificial things differ from natural things not in form or essence, but only in the efficient.”¹⁸² Commentators tend to fixate on Bacon’s claim that nature and art are indifferent efficient causes while ignoring Bacon’s claim that things natural and artificial have the same form or essence. Aristotle, of course, often analogizes between products of art and natural beings. For example, he distinguishes material, efficient, formal, and final causes by analyzing the causes that bring a statue into being, but claims that the same kinds of causes are at work in nature. But analogies show us differences as well as likenesses, and the artificer’s idea is a formal cause of an artifact in a different way than the form of a natural being is a formal cause. Natural beings have in

¹⁸¹ *NO* I §99 (*OFB* XI, 157-59).

¹⁸² *DGI* (*OFB* VI, 103). Cf. *DAS* II.2 (*SEH* IV, 294-95). For another discussion of this passage and the weight commentators have put on it, see Sophie Weeks, “Francis Bacon and the Art-Nature Distinction,” 101-05.

themselves and in virtue of themselves a principle of motion; the formal and efficient causes of artifacts, insofar as they are artificial, do not. Natural forms are self-realizing; artifacts require an artificer. Natural forms exist regardless or in spite of man; without man, artificial forms would not exist. So Bacon's identification of natural and artificial forms is impossible if natural forms are, as Aristotle said, self-realizing final causes. The indifference between natural and efficient causes depends on a prior reconceptualization of form that denies not just Balbus's brand of universal teleology, but also the substance-specific teleology that takes a being's form to be its final cause.

That new understanding of natural form changes the relationship between nature and art. On Aristotle's understanding, art can complement and cooperate with nature just because art and nature are separate creative principles, neither reducible to the other, but where one, nature, is obviously primary. Perfective or imitative art seeks nature's goals, but by different means. So there can be no victory, as there is for Bacon, of art over nature.¹⁸³ Art and nature are not in competition; they are not even running the same course. Bacon, by contrast, detests the "subtle evil" and "profound despair" that comes from considering art "solely as a kind of supplement to nature" with the power "either to finish what nature has begun or put it right when it has gone astray," but lacking the power to "alter [nature] radially and shake it to its depths."¹⁸⁴ Art that aims to alter nature rather than perfect nature cannot, of course, take nature to be a rule or standard in any meaningful way.

The greater scope of Bacon's mastery of nature surprisingly rests on his more limited view of art's power. "Man," Bacon says, "can do nothing except bring natural bodies together or put them

¹⁸³ *NO I* §117 (*OFB XI*, 177).

¹⁸⁴ *DGI* ch. 2 (*OFB VI*, 103).

asunder; nature does the rest from within.”¹⁸⁵ Nature is the only truly creative force. All man can do is direct those forces by binding and constraining them.¹⁸⁶ That underlying creative nature, *natura naturans*, can never be mastered by human art. The nature man masters is nature in its ordinary course. Nature in its ordinary course is nature “free and left to go its own way and unfold itself.”¹⁸⁷ Yet nature free to go its own way and unfold itself does not mean, for Bacon, that nature unimpeded seeks some *telos*. Final causes, he says, “obviously come from the nature of man rather than of the universe.”¹⁸⁸ The outstanding feature of nature is not that it is ordered toward certain ends, but that it is indefinitely malleable. Because nature itself does not realize the most fitting or the most useful arrangement of things, man must secure his own good by remaking nature into the Kingdom of Man. Art supplies the ends that nature lacks and actively seeks those ends by exploiting possibilities always latent within nature itself. The practical goal of mastery depends on this more plastic view of nature.

Aristotle said that habit creates a second (human) nature.¹⁸⁹ In a way, Bacon merely generalizes Aristotle’s insight. Nature free and in course is merely nature’s deep-rutted ways, nature’s habit. Guided not by nature’s ends but by man’s purposes, mastering art can renature nature, can rehabilitate nature and bring about an “alternative universe” of things. Bacon’s attempt to escape the anthropocentrism of the old science requires making man a new kind of rule or measure.

¹⁸⁵ NO I §4 (OFB XI, 65).

¹⁸⁶ See Sophie Weeks, “Francis Bacon and the Art-Nature Distinction.” She convincingly shows that, for Bacon, art “recapitulates the original binding of matter.”

¹⁸⁷ DGI ch. 2 (OFB VI, 101).

¹⁸⁸ NO I §48 (OFB XI, 87).

¹⁸⁹ Some translators use the term *second nature* in rendering *Nicomachean Ethics* VII.9 (1152a30-33). Aristotle’s Greek does not contain an equivalent phrase. Aristotle says that habit is *like* nature. That likeness is what makes habit hard to change. He then quotes—approvingly, it seems—Evenus’s more complete identification of habit and nature. In *Nicomachean Ethics* II.1, Aristotle argues that virtue does not arise by nature since we can be habituated contrary to virtue, unlike a stone, which cannot be habituated to move upwards, or fire, which cannot be habituated to move downwards. Unlike stones and fire, man has a less determinate nature; he can be habituated to virtue or vice.

2.11 Artificial Experience and the Recapitulation of Ordinary Experience

I have argued that Bacon grounds his new science in a new artificial or “methodical” mode of experience. Our minds are beset by Idols, our senses are weak and deceitful, and nature hides, showing us only one of its indefinitely many faces. Bacon’s solution to the problem of nature’s hiddenness and the mind’s waywardness is to impose method: the “natural” functioning of both the sense and the mind must be disciplined and guided. Bacon complains of the old philosophers’ and the mind’s own inveterate *anticipations* of nature. Reason undisciplined by method “impetuously and prematurely” runs ahead of experience; the mind intermixes its own nature with the nature of things. Surprisingly, though, Bacon does not propose to cure the mind’s habit of anticipating nature by forcing reason to wait on experience. Because experience on its own is blind and stumbling, reason must be somehow out in front of experience, the clue that guides us through the woods of experience. The trick is not to stop altogether the mind from anticipating nature, but to teach and constrain the mind to anticipate legitimately.

The helps and aids Bacon proposes—a methodical natural history, a set of strategies for generating induction-ready experience, and especially experiments that put the information of the senses and reason’s anticipations on trial and vex nature out of its ordinary course—do not merely augment or correct natural or ordinary experience; they radically reconstitute it. That new mode of experience is active in the sense that it intervenes, putting to nature the questions that reason wants answered. Those questions and the question-putting strategies reason employs can be traced back to Bacon’s critique of human reason and to his new idea of nature, a roughed-out picture of what nature is and how it works. Artificial experience is reason-guided experience, a set of scientific practices that are neither purely *a priori* nor *a posteriori*, neither rational projection unconstrained by

experience nor an account culled from unguided experience. Reason's projections—what in Bacon's own words we should call reason's *anticipations*—must always be constrained by nature itself.

Experience on its own, though, cannot unravel nature's secrets. To navigate nature's labyrinth, experience needs from reason some key or clue. The mutual conditioning of the two faculties is what Bacon means by the marriage between reason and experience.

Kant applauds Bacon's uniting of reason and experience, but of course Bacon does not have in mind anything like Kant's account of reason's role in the constitution of experience. John Dewey comes much closer to Bacon's mark, expressing himself in language very like Bacon's:

Now there is only one road to discovery, and that is penetrating inquiry into the secrets of nature. Scientific principles and laws do not lie on the surface of nature. They are hidden, and must be wrested from nature by an active and elaborate technique of inquiry. Neither logical reasoning nor the passive accumulation of any number of observations—which the ancients called experience—suffices to lay hold of them. Active experimentation must force the apparent facts of nature into forms different to those in which they familiarly present themselves; and thus make them tell the truth about themselves, as torture may compel an unwilling witness to reveal what he has been concealing.¹⁹⁰

Experience cannot be exclusively or even primarily receptive. If we base our science on how the world looks right now, right here, to our weak and faulty senses, our theories about nature will always be hopelessly crude and parochial. Instead of the mind passively receiving nature as it comes, man's artful vexations must unmask nature to reveal its more subtle parts and hidden possibilities. Only after art actualizes nature's possibilities can the mind hope to more faithfully and more exhaustively mirror the world.¹⁹¹

¹⁹⁰ John Dewey, *Reconstructions*, 32.

¹⁹¹ Bacon scholars typically fail to see what Kant and Dewey saw. Lisa Jardine, following the historically divergent rationalist and empiricist readings of Bacon's instauration program, supposes that *experientia literata* and *novum organum* are two different and irreconcilable scientific programs that make different appeals to experience. Her version of *experientia literata* gives too little scope to reason; her version of Bacon's inductive method gives too limited a role to experience. Because she never asks about the source of those precepts that Bacon says ought to guide experimental work or the compilation of natural histories, she misses the idea of nature which informs and connects Bacon's methodical prescriptions and his natural-historical and experimental precepts. Trusting Gassendi's and Mersenne's critique, she declares Bacon's attempt to marry reason and experience a "philosophical failure" ("*Experientia literata* or *Novum*

But—and this is important—Bacon cannot simply abandon our ordinary experience of beings. Aristotle was right: they really are what is first for us and, we can add, what is first for everyone unavoidably and always. There is no “extraordinary” experience that doesn’t begin with ordinary experience. Bacon says, for example, that only individual bodies exist, yet Bacon’s histories and so also his induction require in practice that we make an initial grouping of instances by kind, guided at first by the non-rigorous distinctions we make in ordinary experience. Whatever conclusions we finally reach about simple natures, our first acquaintance with Dense and Rare, Hot and Cold, or Heavy and Light comes through ordinary experience. *Experientia literata* suggests methodical variations on common, non-methodical experiences and experiments sometimes use the contents of ordinary experience as signs for what cannot be directly perceived. Artificial experience may be the more adequate starting point for natural philosophy, but artificial experience is itself parasitic on ordinary experience.

Ordinary experience, in grounding artificial experience, cannot remain unchanged. The basic attitude of trust that ordinarily characterizes ordinary experience cannot survive Bacon’s critiques. The student of nature must regard ordinary experience skeptically, with qualifications. Ordinary experience gives us some access to nature in its ordinary course; it can be useful so long as it is kept in its proper place. We can try, for example, to leverage our experience of nature in course, in our neighborhood, just now, in order to gain better access to nature in the primary sense, to what is everywhere and always true. But we must learn to take as tentative and partial our ordinary

Organum?,” 61). Guido Giglioni does not believe Bacon’s project is doomed from the start, but he, too, misunderstands the guiding role reason must take in experience. For him, Bacon’s method aims to “medicine” the mind. Natural history may gather the materials of philosophical induction, but more importantly, it serves as a “preparation” or “intellectual apprenticeship,” the kind of immersion and attention to nature that Bacon does, indeed, say is necessary. “Through the practice of writing about nature,” Giglioni says, “the mind re-adapts itself, however reluctantly, to nature.” Method itself need only restrain reason and refute the Idols that have “adulterated our perception of nature.” When reason is kept out of its own way, experience itself will lead us to the truth about nature. Such an account is too ready to blame reason and too ready to trust experience.

perceptions and the generalizations we abstract from them. What is first for us is not therefore more knowable for us.

Bacon's skepticism toward ordinary experience is ultimately dogmatic in character. For it is a skepticism that already knows what to make of ordinary experience and how to transcend it. Our ordinary experience takes as primary and non-reducible *beings* of a determinate *kind*. Artificial experience allows us to pivot from those ordinary experiences of speciated substances to a mediated experience of the species-neutral properties. The prodigious diversity of kinds gets reduced to the more manageable alphabet of simple natures. We cannot know in advance the exact contents of experience, but thanks to reason's anticipations of nature, we can expect to find at the end of our inquiries pure individual bodies carrying out pure, individual acts according to law. Of course we never directly experience those pure individual bodies or their law-governed individual acts. That is precisely why we need a new, artificial mode of experience.

Baconian science progresses stepwise from experience, but does not make what is first for us any more knowable. Richard Velkley describes Bacon's "partial or qualified ascent from experience" as "bedeviled by the problem of return to its experiential starting-point."¹⁹² Bacon's methodical prescriptions allow us to springboard from ordinary experience of beings-in-their-kinds to species-neutral laws or forms, but it leaves us helpless to make the return. We succumb to the peculiar ignorance Socrates so feared. Our discovery of material and efficient causes leads us to forget what everyone knows, that a man grows by eating and drinking and that Socrates sits in prison because the Athenians decided it was best to condemn him, and he decided it was best to undergo whatever penalty they ordered.

¹⁹² Richard Velkley, "Masks of Mastery: Richard Kennington on Modern Origins," *The Political Science Reviewer* 31 (2002), 12.

We are made thus to see double. We experience the world as it is for us, *ex analogi hominis*, and the world as it is in itself, *ex analogi universi*. The single world becomes two in our thinking, the world of everyday experience and the world we know scientifically. That doubleness is the cost of Bacon's recapitulation of ordinary experience. To see the world doubled is disorienting. "At the very least we are confused," Leon Kass explains:

on the one hand, we necessarily trust (because daily life demands that we do) our own experience and the surface appearances of things; on the other, we at least tacitly believe in the deeper truth of the abstracted scientific view. We latch on to a system of thought that provides confidence through its ability to predict and control, but we do not notice that it does not help us truly to see nature or ourselves or to understand any phenomenon right before our eyes. We have lost our way in the world partly because we no longer believe that our ordinary experience of life in the world may be the privileged road to the deepest truth. We are today, before the large human questions, like men lost at sea without a compass. We adhere to a science that provides us with enormous power to travel but that denies the existence of knowledge about who we are and where we should go.¹⁹³

Bacon acknowledges this doubleness when he grants a continued role for the old philosophy as a second clan or tribe.¹⁹⁴ The old philosophy failed to grasp nature but could speak meaningfully to men's interests, and to that extent Bacon believes it will continue for some time to be useful. As Bacon's new science develops and matures, though, the gap between the ordinary and the scientific views—between the old and the new tribe—inevitably widens. Man's self-understanding is the point of greatest tension. Convinced that nature is ultimately composed of unspeciated bodies acting according to nature's appetites but not for the sake of any end, man must nevertheless experience himself as an integral being of a specific kind who guides his actions by considerations of the good. The truths we methodically discover about nature give us more power to manipulate the world in which we live. Nature can be wrenched out of its ordinary course and remade to suit our purposes. But our power over nature may be powerless to help us take our bearings or guide our choices. In

¹⁹³ Leon Kass, *The Hungry Soul*, 8.

¹⁹⁴ *NO* Preface (*OFB* XI, 57-59).

becoming masters of nature, we may lose ourselves and the world we have always known. Perhaps only wisdom about human things can tell us whether Bacon's escape from the cave of ordinary experience does not finally imprison us in another, more comfortable and accommodating cave of our own making.

Chapter 3

Bacon's Reinterpretation of Form

The previous chapter explored the last of Bacon's three critiques of the ancient philosophers' form of investigation. The ancients' starting point in ordinary experience, in what is unqualifiedly first for us, must be replaced, Bacon argues, with a new, methodical or artificial experience. Reason must put its questions to nature and compel it to answer in the form of a more literate and intelligible experience. From that new starting point, Bacon promises to correct the ancients' second error, their headlong leap from a cursory investigation of a few particulars to the most "abstract and useless generalities," by a new method that instead "gradually rises" inductively, through intermediate axioms, "to [generalities] which really are better known to nature."¹ This error in the ancient "order of demonstration," I will argue, is just as truly a mistake about the proper object of science. Because Bacon is offering a new *method*, we tend to focus on questions about the right scientific *procedure*. The weight falls on the juxtaposition between the old, dialectical science's precipitous leap and the new, inductive science's gradual ascent. Questions about *how* science is done overshadow questions about *what* we know.

But the more consequential juxtaposition is between the old science's "abstract and useless generalities" and the generalities "better known to nature" that Bacon engineers his new science to discover. Bacon does not promise to teach us a new set of procedures for discovering the kind of

¹ NO I §22 (OFB XI, 73). Cf. NO I §125 (OFB XI, 187-89).

useless generalities the ancients claimed to know.² His new method excels the old method by enabling knowledge of an altogether different and more useful sort of generality—laws of nature.

Setting aside their differences, for Plato and Aristotle, scientific knowledge was primarily knowledge of *forms*. Bacon keeps their term, but gives it a radically new meaning. “The work and aim of human knowledge,” he says, “is to discover (and the following are the terms which I possess that come closest to what I mean) the form, or true difference, or *natura naturans*, or source from which a given nature arises.”³ He has “not forgotten what I noted and corrected above as an error of the human mind in denouncing the view that forms are primary essences.” Bacon’s forms, in fact, are not principles of substantial beings *as such*, not the natures or essences of beings and their kinds, but rather the “laws” according to which individual bodies carry out their individual acts. Those laws have a hierarchical structure. Beginning with less general laws, the diligent natural philosopher ascends to knowledge of more general laws, and finally (if it is within man’s power) the knowledge of “*Opus quod operatur deus a principio usque ad finem, the Summary law of Nature*.”⁴ Perhaps, then, what looks at the beginning like many laws is really just one. “It is this *law*, then, and its *clauses*,” Bacon says, “that I understand by the name of forms.”⁵ Bacon’s critique of the ancients’ “order of demonstration,” then, is at the same time a critique of the ontology it supposed.

² Bacon’s compass and straightedge metaphor is, in this case, misleading. Bacon uses the image to present his project more humbly and downplay the rivalry between his new science and the old. A man equipped with a ruler and a compass can surely draw a straighter line or a truer circle than a man who draws them freehand. The image suggests that method achieves more perfectly the same act tried unmethodically. Taken generally the comparison is true: Bacon believes he has drawn a better picture of nature. But his picture is not just a sharper, more detailed, or corrected version of the ancients’ picture.

³ NO II §1 (OFB XI, 201).

⁴ AL II (OFB IV, 85). See also DAS III.4 (SEH IV, 362).

⁵ NO II §2 (OFB XI, 201-203).

My purpose in this chapter is to explore the meaning and implications of Bacon's new understanding of form or law. For, like Aristotle, Bacon believes that "it is the *form* that is nature."⁶ I will investigate Bacon's forms in three waves.

I begin by looking at the structure of Bacon's natural philosophy. Bacon proposes not one but *two* new sciences of nature, a science of laws and a science of beings, both premised on a rejection of Aristotelian substantial forms. The contrast between Bacon's science of laws and Aristotle's science of beings will help us uncover, in broad outline, Bacon's new ontology and the narrower scope of methodical or scientific knowledge. These are the matters I take up in the next section, "Bacon's Two Sciences of Nature."

Bacon also divides natural philosophy into speculative and operative parts, but promises, by their mutual support, an unprecedented rapprochement between man's knowledge of and his power over nature. The rapprochement of knowledge and power requires a new understanding of human *poiesis*: practice must become theoretical. But knowledge, too, is transformed by the rapprochement. Thus in "Forms and the Unity of Speculative-Operative Science," we will look at form as the principle grounding the union of theoretical knowledge and operative power.

Finally in "Methodological Materialism," the chapter's concluding section, we will approach Bacon's new concept of form by asking just what it is that is better known by nature, and what is the character of such knowledge. It is easier to say what Baconian forms are not. They are not real principles or first principles, nor are they known through real principles or first beings. Instead, they are what I will call *methodological principles*, non-ultimate but non-arbitrary conclusions of methodical inquiry. I will show that forms function as intelligible intermediaries between unintelligible matter

⁶ Aristotle, *Physics* II.1 193b19. Cf. NO II §13 (OFB XI, 237) and NO II §§3 and 4 (OFB XI, 203-205).

and the simple natures we methodically experience. Starting with simple natures, we proceed in the direction of those first and simple bodies Democritus called atoms. We will never, if we are honest, reach those first principles; beginning with experience, we must conclude with general rules about the relationships between manifest natures. Those rules are genuine knowledge, but not knowledge grounded ultimately in first causes. Knowledge of nature's laws is merely positive in the sense that it is grounded in the procedure that discovers it and the productive power it makes possible. That procedure or method assumes, I will show, a materialist ontology that it cannot theoretically know—what I will call Bacon's *methodological* materialism.

I should say something, too, about how this chapter figures in my larger argument. Bacon's reinterpretation of form is probably the most important expression of the kind of pre-methodical anticipation that, as I argued in the first chapter, is the real foundation of Bacon's instauration and the core of his *idea* of nature. The new idea of form, as the terminus of method, is the appropriate bookend to the new methodical starting point I described in the second chapter. And because form is the principle that both sets a limit to our knowledge and reconciles that knowledge with operative power, this exploration of Bacon's forms is the necessary background for our discussion, in the next chapter, of Bacon's critique of the end of knowledge.

3.1 Bacon's Science of Beings and His Science of Laws

Bacon pits his new science against the old science, and there is good reason to talk broadly about each as a single, coherent science. But neither the old science nor Bacon's new science is actually simple. From his earliest natural-philosophic writings, Bacon critiques the received divisions

of the sciences. His Instauration begins, in fact, by redrawing those divisions. For the divisions of a science make some claim about the kind of things there are to know, the relations holding between those things, and the way in which those things come to be known. Think, for example, of the ontological and epistemological assumptions informing Bacon's division of human knowledge into history, poetry, and philosophy, corresponding to the three faculties involved in knowing (memory, imagination, or reason). Or think of the ontological and epistemological assumptions supposed by Bacon's further tri-part division of rational knowledge into a science of God, a science of nature, and a science of man. Redrawing the divisions of a science requires substituting a revised ontology and epistemology for the ontology and epistemology reflected in the old divisions. So one way to get at Bacon's idea of nature is to interrogate his own, novel divisions of natural science. And because Bacon's novel divisions develop out of his critique of the old divisions, it will help at certain points to compare the structure of Bacon's natural science with the structure of Aristotelian natural science.

3.1.1 Distinguishing Physics and Metaphysics

Discussions of the structure of Bacon's new natural science typically begin—and just as typically end—with Bacon's classification of sciences in the *Advancement of Learning* (1605) and its Latin enlargement, *De augmentis* (1623).⁷ In both the *Advancement* and *De augmentis*, Bacon makes two

⁷ Richard Kennington notes that “Bacon's judgments of metaphysics and physics are revised in *New Organon* 2.9, as is often overlooked by those who take the *Advancement* as the canonical version of Bacon's classification of the sciences” (“Bacon's Critique of Ancient Philosophy in *New Organon* 1,” 22). In my interpretation, below, I argue that Bacon's judgments in these texts is consistent, but not equally forthright. Kennington emphasizes the exclusion, in the *Novum organum*, of final causality from both main branches of natural philosophy. Bacon's “just division of the arts and sciences” in NO II §9 rightly characterizes the structure of Bacon's natural science and can serve as a key to a more nuanced interpretation of the corresponding passages in *AL* and *DAS*.

key divisions.⁸ First, he divides the whole of natural philosophy into its “Speculative” and “Operative” parts, the former an “Inquisition of Causes,” the latter dealing with the “Production of Effects.” For Aristotle, of course, there is no *science* of the production of effects. Science is one thing, art another. Bacon, too, judges it necessary to treat the speculative and operative departments of natural philosophy separately. Still, the science of causes and the science of effects, he says, “must in a certain way be united and conjoined.”⁹ We shall soon have to ask just what kind of union Bacon has in mind.¹⁰

Both the speculative and operative parts of natural philosophy can be further divided—speculative natural philosophy into “Physic” and “Metaphysic,” operative natural philosophy into “Mechanic” and “Magic.”¹¹ Bacon’s distinction between physics and metaphysics is not the same as Aristotle’s. What, then, distinguishes Baconian physics from Baconian metaphysics?

Bacon, in fact, supplies three separate explanations.¹² Most interpreters fixate on the last: physics inquires into material and efficient causes, metaphysics inquires into formal and final causes.¹³ But that more familiar distinction is probably the least helpful. For though Bacon retains Aristotle’s terms, he surely does not retain Aristotle’s meanings, and we are left to supply for ourselves Bacon’s reasons for pairing off, as Aristotle never does, those four causes.¹⁴

Bacon’s second explanation of his division between physics and metaphysics is almost certainly purposefully misleading. Physics, he says, “supposes in nature only a being and moving and natural necessity” while metaphysics, because it deals with final causes, “supposes also a mind and

⁸ See *AL* II (*OFB* IV, 80-81) and *DAS* III.3-4 (*SEH* IV, 343-65).

⁹ *DAS* III.3 (*SEH* IV, 343).

¹⁰ *Form* as the principle underlying both knowledge and power is the subject of the following section.

¹¹ *AL* II (*OFB* IV, 82-87 and 88-90), *DAS* III.4 (*SEH* IV, 344-49), and *DAS* III.5 (*SEH* IV, 365-69).

¹² See *AL* II (*OFB* IV, 82).

¹³ *AL* II (*OFB* IV, 82) and *DAS* III.4 (*SEH* IV, 346).

¹⁴ See *NO* II §2 (*OFB* XI, 201-203).

idea.”¹⁵ Physics, that is, would seem to deal with *physical* causes; metaphysics, with *nonphysical* causes. The purpose of the division, on this account, is to quarantine those “discoursing” or “specious and shadowy causes” to protect the more diligent but often neglected inquiry into truly physical causes. Once Bacon sides with Democritus against those theologizing philosophers like Plato and Aristotle who would make God or Mind a principle of their natural philosophy, Bacon’s division would seem to collapse into a distinction between the true natural science and a non-natural or specious science.¹⁶

But of course Bacon does not mean to do away with metaphysics altogether. Plato, “a man of sublime wit (and one that surveyed all things as from a lofty cliff),” saw that forms were the proper object of knowledge, but “lost the fruit of his most true opinion by considering and trying to apprehend Forms as absolutely abstracted from matter.”¹⁷ Bacon’s objection is not that Plato treated form as *separable* from matter, since what he says about “Forms of Substances”—that they are “perplexed and complicated,” the result of “simple natures” “compounded” and “transplanted”—suggests that Aristotle’s hylomorphism is likewise guilty of “abstracting” form from matter.¹⁸ Bacon wants to discredit the old understanding of metaphysics while retaining the name for a wholly natural—and so *physical*—science, a science, as we will see, that can nevertheless be meaningfully distinguished from physics. Reconstituted as an inquiry into the “formal” causes of “dense, rare, hot, cold, heavy, light, tangible, pneumatic, volatile, fixed, and the like”—the same objects, as it happens, of one branch of Bacon’s physics—metaphysics is a genuine science.¹⁹

¹⁵ *DAS* III.4 (*SEH* IV, 346). Cf. *AL* II (*OFB* IV, 82). The earlier *AL* text does not list “natural necessity” among the suppositions of physics.

¹⁶ See *DAS* III.4 (*SEH* IV, 363-364).

¹⁷ *DAS* III.4 (*SEH* IV, 360).

¹⁸ *DAS* III.4 (*SEH* IV, 360).

¹⁹ *DAS* III.4 (*SEH* IV, 361).

Bacon's second explanation of the division between physics and metaphysics therefore undercuts his division by the type of causes each is competent to inquire. Whatever he means by material and efficient causes, we can be sure that Bacon's metaphysics has no real truck with final causes and also sure that we must reinterpret those formal causes which are the proper business of his reformed metaphysics as *physical* causes, not the *tele* of beings in their kinds (an understanding of *forms* as *final causes*), but the kind that have a place in nature governed not by God or Mind or Idea, but by Fate or Fortune or "the necessity of matter."²⁰

These two explanations have taught us that theoretical natural science inquires into three types of cause, all of them physical, but they have not taught us the true difference between physics and metaphysics. Bacon's first explanation is not very helpful, either. Whereas physics "handles that which is most inherent in matter and therefore transitory," metaphysics deals with that which is "more abstracted and fixed." Aristotle never, to my knowledge, suggests that some types of natural cause are more reliable or stable than others. Bacon himself suggests that efficient, material, and formal causes are governed by "natural necessity" or, more specifically, "the necessity of matter." So what could Bacon mean when he says that material and efficient causes are more "transitory"? Do formal causes inhere in matter any less than material and efficient causes? Neither the *Advancement of Learning* nor *De augmentis*, I submit, offers a very clear account of the structure of Bacon's new natural science.

The *Advancement of Learning* and *De augmentis* bookend, more or less, Bacon's natural philosophical writings. In the intervening years, he published the more forthright *Novum organum* (1620). There, Bacon marks the "just division of philosophy and the sciences" by assigning "the

²⁰ *DAS* III.4 (*SEH* IV, 364).

investigation of forms, eternal and immutable as they are (by reason surely, and according to their law)” to metaphysics and “the investigation of *Efficient* and *Material Causes*, and of *latent process* and *latent schematism*” to physics because these latter “all relate to the common and ordinary course of nature, and not to her fundamental and everlasting laws.”²¹ We recognize Bacon’s distinction, made earlier in *Advancement* and later in *De augmentis*, between the “transitory” material and efficient causes that belong to physics and the “more abstracted and fixed” formal causes that belong to metaphysics, but here Bacon refers this difference to a more fundamental distinction between nature in its common and ordinary course and nature simply.²² Nature in its common or ordinary course means the nature of our everyday experience, a world populated with beings of specific kinds. Physics is a science of beings, investigating the material structures and motions peculiar to those beings we meet with in our ordinary experience. But it is a science of beings that abstains from supposing the kind of formal principles that Plato or Aristotle invoked to explain the diversity of beings and the essential character of each kind. The specific habit or “nature” of each species is more truly attributed to the configuration (what Bacon calls *latent schematism*) and motion (what Bacon calls *latent process*) of the being’s parts. Arising from “infinite essays and proofs of nature,” those species are neither eternal nor immutable, but merely the present and relatively stable shape matter has taken on.²³

Metaphysics, on the other hand, investigates “forms” or laws that cut across species and, because they are laws of matter itself, are, like matter, eternal and immutable. Or at least we must think so. For what matter itself is and whether the laws that govern its action are unchanging cannot

²¹ NO II §9 (OFB XI, 215).

²² Richard Kennington also turns to *Novum organum* to better understand the structure of Bacon’s natural science. See “Bacon’s Ontology,” 45-47, and “Bacon’s Reform of Nature,” 11-12.

²³ DAS III.4 (SEH IV, 363).

be presently known and may be forever unknowable. For all Bacon knows, the laws studied by metaphysics could be transitory and mutable, just like the beings physics studies. That possibility does not make the distinction between physics and metaphysics arbitrary. There really is a difference between laws and beings. Metaphysics investigates nature simply, what Bacon, borrowing the scholastic terminology, calls *natura naturans*. This underlying, active nature—“the source,” as he glosses it, “from which a given nature arises”—is what Bacon means by *form* and is the proper and primary object of natural philosophy.²⁴ Physics by contrast investigates *natura naturata*, just those concrete beings or “given natures” that come into being through the fundamental activity of nature naturing. Those concrete beings may belong, as Bacon says, to nature in its ordinary course, but physics must also comprehend the scientific investigation of the beings that belong to nature’s two other courses, to nature’s pretergenerations or the products of human art. For any beings we can experience are “natures concrete or bound together and embodied in a structure,” the “particular and special habits of nature.”²⁵ A concrete being, whether a regular and spontaneous product of nature, one of nature’s sports, or an invention that comes to be through art, is always *natura naturata*.²⁶

Corresponding to Bacon’s division between physics and metaphysics are two ways of conceiving bodies. Metaphysics “looks on a body as an array or conjunction of simple natures”

²⁴ NO II §1 (OFB XI, 201).

²⁵ NO II §5 (OFB XI, 209).

²⁶ Richard Kennington identifies, as I do, the objects of Bacon’s physics with those beings and their species that we meet with in the ordinary course of nature. But unlike me, he locates the laws that are the proper business of metaphysics in nature’s third state, in nature constrained and molded by human art. Kennington’s argument seems to assume that nature is exhausted by its three determinate states. Since the laws of nature do not belong to nature’s ordinary course or the monstrous, they must belong to the artificial. While I agree that artifacts, including experimentally created phenomena, provide special access to nature’s fundamental laws, those laws, I think, belong to nature simply or to what Bacon might call *natura naturans*. All three determinate states are, by contrast, *natura naturata*. Art is just an alternative theater of things, another mask nature wears, and so no less natural. Put another way, the laws discovered through methodical experiment are principles of things artificial no less than they are principles of those beings nature spontaneously produces. See Richard Kennington, “Bacon’s Ontology,” 45–47, and “Bacon’s Reform of Nature,” 11–12.

whereas physics looks on a body as a being whose character is determined by the configuration and motions of its parts. Looked at “metaphysically,” for example, gold is the conjunction of certain simple natures—“yellow, weight, ductility, fixity, fluidity, dissolution and the rest”—each in its “proper degree and amount.” Looked at “physically,” that same lump of gold is the “finished mineral” that, “starting with its first menstrua or rudiments,” came to be through “the whole run of motions and the various and protracted travails of nature,” what Bacon calls, in the *Advancement of Learning* and *De augmentis*, “causes vague, variable, and respective.”²⁷ By “respective,” Bacon means that these material and efficient causes are indexed to specific kinds of concrete bodies; they account for the generation of just this concrete body or just this type of concrete body. Respective to clay, fire is a cause of induration, but respective to wax, fire is a cause of colliquation.²⁸ The first rudiments and the whole run of motions that produce gold are specific to gold; the “first concretions of juices in the earth, or the seeds” and the sequence of motions that result in the mature plant are specific to the type of plant it is.²⁹ Physics, therefore, handles “nature manifold or diffused” and “all variety of things”—beings in their kinds and the causes respective to those kinds—and, in a special way, nature “united or collected,” the “structure of the universe” which is nevertheless just one possible determination of nature itself. That is, physics is the science which investigations nature insofar as it is already determined, not nature naturing, but nature natured. The object of metaphysics, on the other hand, is nature itself, undetermined in any specific form, and causes irrespective of any particular determination, those “general and fundamental laws” or

²⁷ NO II §5 (OFB XI, 209) and DAS III.4 (SEH IV, 346). Cf. AL II (OFB IV, 82).

²⁸ DAS III.4 (SEH IV, 346). Cf. AL II (OFB IV, 82).

²⁹ NO II §5 (OFB XI, 207).

“primary and catholic axioms” through which man grasps not nature’s special and peculiar habits, but “the unity of nature beneath the surface of materials which are very unlike.”³⁰

The image Bacon prefers in the *Advancement of Learning* and *De augmentis* likens nature to a text. Concrete beings—a lion, an oak, gold, or even water or air—are like words formed by the “composition and transposition” of individual letters, which are like the simple natures—“dense, rare, hot, cold, heavy, light, tangible, pneumatic, volatile, fixed, and the like”—that “make up and sustain the essences and forms of all substances.”³¹ The physicist reads whole words, taking as his object the “infinite” variety of actual combinations of nature’s simples. He studies concrete beings in the way a literate person reads most words, by sight, without any conscious phonetic reduction. The metaphysician sees those whole words but is more interested in the individual letters. His goal is to understand nature’s alphabet, trusting that, once he has understood the limited number of nature’s simples, he will readily understand, and just as readily produce, those compounded forms. Metaphysics differs from physics by asserting a different unit of intelligibility, the individual letter or natural law rather than the word or substantial being. Bacon is confident that the knowledge of and power over those compound forms will be limited so long as physics does not lead to and eventually give way to metaphysics. But physics can be pursued independently of metaphysics and seems, Bacon admits, “more accessible, closer to hand, and to give more grounds for hope.”³² Literacy is more than phonetic facility; one can know how a word sounds without knowing what it means. Bacon’s image suggests, perhaps unwittingly, that a science of laws cannot fully comprehend the beings that are the object of a separate science.

³⁰ *NO* II §§5 and 3 (*OFB* XI, 209 and 203).

³¹ *DAS* III.4 (*SEH* IV, 360-61). Cf. *AL* II (*OFB* IV, 84). Bacon does not use or develop the alphabet metaphor in *NO*. He comes closest at *NO* I §121 (*OFB* XI, 181) and does make use of the metaphor in *DO* (*OFB* XI, 41), which was published with *NO*.

³² *NO* II §5 (*OFB* XI, 209).

3.1.2 *The Unity of Bacon's Natural Philosophy*

So far I have focused on Bacon's division of natural philosophy, but it should be clear now that we must also ask how these distinct investigations fit together. Bacon's two key divisions yield four separate departments or branches of natural philosophy, a theoretical science of beings (physics), a theoretical science of laws (metaphysics), an operative science of beings (mechanics), and an operative science of laws (magic). Each department has its own proper "work and aim." Bacon identifies the goals of metaphysics and magic with the goals of human power and human knowledge simply: "The work and aim of human power is to generate and superinduce a new nature or new natures on a given body. The work and aim of human knowledge is to discover (and the following are the terms which I possess that come closest to what I mean) the form, or true difference, or *natura naturans*, or source from which a given nature arises."³³ Both metaphysics and magic rest on true knowledge of nature's forms or laws. They share, as we will see, the same norms and the same working procedure. Indeed, the theoretical and operative sciences of laws differ only in the human good they achieve, and even then the good achieved by one confirms and advances the good achieved by the other. Our power grows with our knowledge, and new power over nature opens up new avenues for our theoretical investigations.

The goals of physics and mechanics are "secondary and lesser," though what it means to be the secondary and lesser *theoretical* science may be different than what it means to be the secondary and lesser *operative* science. The goal of mechanics, "the transformation, within the bounds of the *possible*, of concrete bodies from one into another," is really only a more restricted version of magic's aim. Magic, grounded in metaphysics's knowledge of nature's laws, "enfranchises the power of men to the

³³ NO II §1 (OFB XI, 201).

greatest liberty, and leads it to the widest and most extensive field of operation,” whereas mechanics, grounded in physics’s knowledge of the constitution of beings, “carries men in narrow and restrained ways, imitating the ordinary flexuous courses of Nature.”³⁴ The scope of an operative science’s power expands as the knowledge on which it rests becomes more general. Because physics grasps causes respective to specific, concrete beings, mechanics must more humbly aim to transform specific, concrete bodies. Less clear is whether physics, the proper work of which is the discovery “in every case of generation and motion” of the latent processes and schematisms, is really only a less general version of metaphysics. To put the question more pointedly: is Bacon’s science of laws continuous with his science of beings?

Bacon talks as if they were. He pictures their unity as a pyramid. Natural history is the base. Above it stands physics which, in one of its parts, at least, is but “a gloss or paraphrase attending upon the text of natural history.” Physics more generally is a “middle term” between natural history and metaphysics, which occupies the place immediately above it. Finally, the pyramid’s point is “the summary law of nature” or “the work which God worketh from the beginning to the end.” Science moves from a factual description of concrete beings, through a causal science of those beings, to a science of laws, culminating in knowledge of the most general law of nature. These “are the true stages of knowledge,” Bacon reports: the ascent from natural history to physics to metaphysics somehow enables us to begin with experience of particular beings but end with knowledge of the most general law. Parmenides and Plato guessed right, Bacon says: “all things by a certain scale ascend to unity.”³⁵

³⁴ *DAS* III.4 (*SEH* IV, 362). Bacon’s professed subject in this chapter is the division of the speculative doctrine of nature, but here he slips into a discussion of the operative power made possible by *metaphysics* and *physics* without mentioning, as I have, *magic* and *mechanics*.

³⁵ *DAS* III.4 (*SEH* IV, 362).

As the pyramid narrows, so do the number of axioms necessary to comprehend the particulars at the pyramid's base. The ascent is always toward greater generality, for "it is the duty and virtue of all knowledge to abridge the circuits and long ways of experience (as much as truth will permit) . . . by collecting and uniting the axioms of science into more general ones, and such as may comprehend all individual cases."³⁶ The laws or formal causes that are the subject of metaphysics would therefore be more general versions of those material and efficient causes discovered by physics or, what is the same, those material and efficient causes are further determinations of metaphysic's more general laws. Formal causes would be the only fundamental causes since what we call material and efficient causes are just formal causes compounded; the variety of particular beings result from the "commensurations and co-ordinations" of nature's simple forms.³⁷ Those simple forms "are not many and yet make up and sustain the essences and forms of all substances." Those substances, in fact, are really nothing but "perplexed and complicated" conjunctions of simple natures, achieved "by compounding and transplanting multiplied."³⁸ If Bacon's physics and his metaphysics are really continuous, what I called his "metaphysical" view of bodies must be the true view. And that seems to be the view expressed in Bacon's resolute ontology in *Novum organum*: "nothing really exists in nature besides individual bodies, carrying out pure, individual acts according to law."³⁹ Those truly existing individuals bodies are not natural substances in Aristotle's sense, but something like atoms or corpuscles of matter or at any rate some probably imperceptible and material body. The law governing those corpuscles is perfectly general, not the special nature or

³⁶ *DAS* III.4 (*SEH* IV, 361).

³⁷ *DAS* III.4 (*SEH* IV, 362).

³⁸ *DAS* III.4 (*SEH* IV, 360-61). Cf. *AL* II (*OFB* IV, 84).

³⁹ *NO* II §4 (*OFB* XI, 203).

essence of concrete or substantial bodies but the nature of body generally. All natural science, so it seems, must finally therefore be a science of laws.

Our experience is always of concrete bodies; our natural science is always a science of laws. How is it possible, we might wonder, to move from an experience of bodies to a knowledge of laws? Physics is the mediating link or pivot between our experience of particular, concrete bodies and our science of laws. Physics can perform this feat because physics itself is more complex than I previously let on. In the earlier *Advancement of Learning*, Bacon, without much explanation or argument, divides physics into three parts, a doctrine of the “CONTEXTVRE or CONFIGVRATION of THINGS” and a doctrine of the “PRINCIPLES or ORIGINALS of THINGS,” both of which deal with “Nature *Vnited* or *collected*,” while a third doctrine concerning “all VARIETIE and PARTICVLARITIE of THINGS” contemplates “Nature *diffused* or *distributed*.”⁴⁰ That same three-part division survives in the later *De augmentis*, but there the discussion is much fuller and, most importantly, Bacon further divides the doctrine concerning the variety and particularity of things into two parts, one part concerning “things Concrete” or “Creatures” or “substances, with every variety of their accidents”; the other part concerning “things Abstract” or “Natures” or “accidents, through every variety of substance.”⁴¹

The only real difference between concrete and abstract physics is a changed perspective, taking “accidents” rather than “substances” to be primitive. Concrete physics, like the natural history it glosses, begins with our ordinary experience of the world and takes on trust the Aristotelian substance-accident metaphysics, privileging, as Aristotle did, substance over its accidents. Abstract physics, too, seems to accept the substance-accident distinction, but upends Aristotle’s metaphysics

⁴⁰ *AL* II (*OFB* IV, 83).

⁴¹ *DAS* III.4 (*SEH* IV, 347).

by putting all the ontological weight on those “accidents.” Bacon’s ontological inversion dissolves the substances populating the world into just so many entangled simple natures and so collapses Aristotle’s hylomorphism—prime matter in-formed by an indefinite number of substantial forms—into active matter and its indefinite number of “appetites” (its law and that law’s clauses). What Aristotle had called “accidents” become for Bacon the “essence,” not of this or that type of being, but of matter itself; Aristotle’s essences become the contingent configuration matter has fallen into through nature’s infinite essays and proofs.⁴² Bacon’s ontology is basically Aristotle’s ontology inverted.

The new ontology grounding Bacon’s metaphysics does not leave his physics of concrete bodies untouched. Physics, like metaphysics, proceeds through analysis. But whereas metaphysics attempts to analyze concrete beings into simple natures and the forms or laws governing them, physics attempts to analyze concrete beings in terms of the configuration and motion of its material parts. The configuration and motion of those parts can be investigated independently of any principle of wholeness or unity. Rather, the whole is known scientifically in terms of its parts and the generative process—the history of motions—that brought those parts together.⁴³ Those parts, moreover, are parts in a different sense. For they continue to be what they are apart from the whole of which they happen to be parts; the parts are themselves wholes that become part-like only contingently, by being temporarily joined to other contingently part-like wholes. Those parts are not in potency to some form; the parts themselves are always fully actual. Physics, that is, analyzes concrete beings into smaller and simpler concrete beings.

⁴² See NO II §20 (OFB XI, 263): “the very heat itself or *Quid ipsum* of heat is motion and nothing else.”

⁴³ Mary Hesse notes that, for Bacon, “material and efficient causes are connected with the natural history of processes rather than with their philosophy, that is, with the accidental ways in which things come into being or are brought about, rather than with their fundamental nature.” See “Francis Bacon’s Philosophy of Science,” 117.

Physics likewise analyzes the motion of these compounded wholes into simple motions. The resolution of complex motions is a fundamental strategy of classical Newtonian physics. Galileo's inclined plane experiments and his study of projectile motions, for example, showed that "natural" motions could be resolved into separate, non-natural components, and the first two corollaries to Newton's third law of motion provide a general tool to resolve and compose the forces acting on bodies in local motion. Bacon supposes, without Galileo's and Newton's mathematical apparatus, that all manifest motions are composites of more simple motions. The "commonplace differences of motion—of *generation, corruption, increase, decrease, alteration, and local motion*—recognized by the received natural philosophy are worthless," crude and popular distinctions suggested by our ordinary experience that "do not penetrate into nature in any way."⁴⁴ Motions that seem to belong to substantial wholes are really composed "by complication, continuation, alternation, restraint, repetition, and various modes of combination" of simple motions of subsensible parts. What "they commonly call alteration," for example, "is really local motion *per minima*."⁴⁵ Only these simple motions "truly proceed from the inward recesses of nature."⁴⁶ So Bacon's physics—his science of beings—does not really take as its objects substances *as substances*.

The farther one traces out the implications of Bacon's new ontology, the harder it becomes to maintain a distinction between his abstract physics and his metaphysics. Bacon's list of the configurations of matter, which is the proper study of abstract physics, doubles as a list of the forms studied by metaphysics. Bacon, too, feels the distinction blurring, and so he twice repeats that Dense, Rare, Heavy, Light, and the other simple natures "are to be no further handled in Physic

⁴⁴ NO I §66 (OFB XI, 105).

⁴⁵ NO I §50 (OFB XI, 87). Cf. DAS III.4 (SEH IV, 356-57).

⁴⁶ DAS III.4 (SEH IV, 356).

than the inquiry of their Material and Efficient Causes,” that is, “only as to their variable causes.”⁴⁷

Physics, for example, would investigate the causes of whiteness in snow or froth, whereas metaphysics would investigate the form of whiteness generally, without reference to a particular subject of whiteness. Bacon’s own example, however, suggests that the boundary between physics and metaphysics is moving and relative. The question is where to locate intermediate axioms or, what comes to the same thing, to decide what level of generality we must achieve before we cross over from physics into metaphysics. The cause of whiteness in snow and froth is “the subtle intermixture of air and water,” but because the intermixture of air and powdered glass or crystal would also yield whiteness—because, that is, the intermixture of air and water is not the *necessary* and *universal* cause of whiteness—we are dealing with an efficient, not a formal cause, and a physical rather than a metaphysical inquiry.⁴⁸ The more general form of whiteness discovered by metaphysics is something like: “two transparent bodies intermixed, with their optical portions arranged in a simple and regular order.”⁴⁹ In *De augmentis*, Bacon clearly treats this second, more general formula as the *form* of whiteness. But in the much earlier *Valerius Terminus*, Bacon supplies four or five “directions,” each more general and “free” than the preceding, between that first direction of whiteness in snow and the more general direction for producing whiteness by mixing unequal transparent bodies.⁵⁰ That scale of ever more general directions could be continued. Whiteness can be produced not only from transparent bodies, but from any bodies whatsoever so long as their parts are “unequal equally” or “in a simple proportion.” And white is just one color among many, so the direction for whiteness is just one part of a more general direction for producing any color. At

⁴⁷ *DAS* III.4 (*SEH* IV, 357 and 361).

⁴⁸ *DAS* III.4 (*SEH* IV, 361).

⁴⁹ *DAS* III.4 (*SEH* IV, 361).

⁵⁰ See *VT* ch. 11 (*SEH* III, 235-41).

what point in the scale did these directions cease to belong to physics and cross over into metaphysics? At what point did these directions begin to pick out formal rather than material and efficient causes? The only non-arbitrary division in the scale of ascending generality is the point at which we shift from subject- or substance-specific causes to subject- or substance-neutral causes. The real split, that is, is not between physics and metaphysics or between the investigation of efficient and material causes and the investigation of formal and final causes, but between a science of beings and a science of laws.

We can confirm this conclusion by considering the scope of Bacon's method proper. The process Bacon lays out in *Novum organum* aims at the discovery of laws but offers no concrete advice about how to investigate latent schematisms or latent processes. The model tables of discovery aim directly at the discovery of the form or law of heat, bypassing any rigorous investigation of the efficient or material causes of heat in specific bodies or kinds of bodies. As Kennington notes, Bacon's "is not a general method of induction."⁵¹ The first step, once we have gathered a sufficient natural history, is, "for a given nature" to gather "all known *instances* which share that same nature, though they occur in very different materials."⁵² The ascent, such as it is, proceeds from natural history directly to metaphysics.⁵³

We are now in a better position to answer our question about the unity of Bacon's natural philosophy and the continuity of the science of beings with the science of laws. I said above that the ascent in Bacon's science progresses stepwise toward greater generality, but the shift from concrete

⁵¹ Richard Kennington, "Bacon's Ontology," 40.

⁵² *NO* II §11 (*OFB* XI, 217).

⁵³ Maxwell Primack argues that, "As far as Bacon is concerned, Aristotelian logic is adequate for the knowledge of the ordinary course of nature," but "inadequate for the knowledge of matter" ("Outline of a Reinterpretation of Francis Bacon's Philosophy," 127). He underestimates the fundamental changes in Bacon's physics by his new ontology and the new, practical goal of science, but in restricting Bacon's method proper to the investigation of forms, he agrees, implicitly, that Bacon's physics and metaphysics cannot be continuous since they do not share a method.

to abstract physics is not simply a generalization of more particular axioms.⁵⁴ Bacon's exemplary search for a form or law of heat is not in any straightforward way a generalization of what we know about the "things Concrete"—the sun, flames, animals and their innards—that Bacon puts forth as "Instances which Share in the Nature of Heat." *Heat* is not a genus uniting and comprehending these species, and whatever we learn about heat tells us nothing about the sun *qua* sun or animals *qua* animals. Besides the presence of the form or nature being investigated, all that counts is the presence or absence of other simple natures. Progress toward the discovery of forms in fact depends on our ability to ignore the essential or substantial differences between the concrete beings in which we find heat. To put the point in terms of Bacon's alphabet metaphor: it does not matter so much what the various words spell, only what letters we need to spell them. Fluency in reading nature's "words," in fact, only gets in the way of the more important phonetic analysis.

3.1.3 Getting from the Ordinary Experience of Beings to the Scientific Knowledge of Laws

Let us dwell for a moment on this remarkable result. The ascent from the experience of concrete bodies to the knowledge of forms or laws depends not, as Bacon's pyramid image led us to expect, on an unbroken series of generalizations, but instead on a shift of perspective and a substitution of one ontology for another, incompatible ontology. The picture of nature informing Aristotle's science cannot be reconciled with the picture of nature guiding Bacon's new science. Bacon's critique of the ancient order of demonstration is at the same time, therefore, a critique of

⁵⁴ Mary Hesse offers a different account: "The real distinction between physics and metaphysics for Bacon is the distinction between the lower and higher axioms of the inductive latter." See her "Francis Bacon's Philosophy of Science," 118.

the picture of nature it supposed. The source of the disagreement is how to understand *beings*. According to Bacon, the heterogeneity of kinds is theoretically arbitrary, an accident both of our particular constitution and the contingent fact of nature's present arrangement. To be is not to be a being of a certain kind.⁵⁵ The ancients, in short, too readily identified *natura naturans* and *natura naturata*, mistaking nature as underlying principle with the shapes or forms it produces. Their principle, *eidos*, confuses the thing itself and its appearance and shows how they too readily trusted that the look of things would reveal the being of things. What is most remarkable, though, is that Bacon's own picture of nature does not just deny the truth of the ancient picture, but takes shape, I think, as the negation of that picture. I referred to Bacon's new ontology as the *inversion* of Aristotle's. If I am right, Bacon's science of laws would depend on a curious transformation of Aristotle's science of beings and so also of our ordinary experience of the world.

That dependence is all the more curious because it depends on beginning with what, from the perspective of the refounded science, must look like a false picture of nature. Because formal causes are the only real causes and because all that exists, says Bacon, are individual bodies and their individual acts, the beings we experience are, at bottom, the complex interplay of those more fundamental laws. But in the order of discovery, it is the opposite: Bacon's science of laws is parasitic on that more "natural" experience of the world and, perhaps, on a prior science of beings. Our ordinary experience of the world will always be an experience of beings and their properties, and to ordinary experience, nothing could be more real than the concrete beings we see and hear and touch. We must *learn* to regard the simple natures, the "accidents" of those beings, as what is really real. "The form of the thing," Bacon says, "is the very thing itself, and the thing"—Bacon

⁵⁵ Kennington, "Bacon's Critique of Ancient Philosophy in *New Organon* 1," 25.

means the *simple nature*, not the *substance*—“does not differ from the form in any other way than appearance from existence, external from internal, or that relative to man from that relative to the universe.”⁵⁶

That truer view—that view *ex analogia universi*—must always, for us humans, be a precarious achievement. Even the most rigorously trained among us slips back into our “natural” way of parsing the world, *ex analogia hominis*, into just so many concrete beings possessing accidents appropriate to their kinds. Take Sir Arthur Eddington and his two tables. Eddington’s first table is the table familiar to all of us: “It has extension; it is comparatively permanent; it is coloured; above all it is substantial,” just the kind of “commonplace object” that belongs to “that environment” that Eddington and we call “the world.”⁵⁷ Eddington’s “scientific” table, the one composed of “numerous electrical charges rushing about with great speed” through mostly empty space, on the other hand, is “a more recent acquaintance,” not part of the ordinary world, but rather “part of a world which in more devious ways has forced itself on [his] attention.”⁵⁸ Only “by delicate test and remorseless logic” has Eddington convinced himself that the “scientific table is the only one which is really there.”⁵⁹ Remorseless indeed is the logic that can overpower the evidence of our eyes and unseat our common sense judgment, but that logic’s victory is doomed to remain incomplete: “modern physics will never succeed,” Eddington laments, “in exorcising that first table - strange compound of external nature, mental imagery and inherited prejudice - which lies visible to my eyes and tangible to my grasp.”⁶⁰

⁵⁶ NO II §13 (OFB XI, 237).

⁵⁷ Arthur Eddington, *The Nature of the Physical World* (Cambridge: The University Press, 1928), ix.

⁵⁸ Eddington, *The Nature of the Physical World*, x.

⁵⁹ Eddington, *The Nature of the Physical World*, xii.

⁶⁰ Eddington, *The Nature of the Physical World*, xii.

“It is true that the whole scientific inquiry starts from the familiar world,” Eddington grants, “and in the end it must return to the familiar world; but the part of the journey over which the physicist has charge is in foreign territory.”⁶¹ The question is, how do we cross that all-important border from the world of common experience into the physicist’s foreign country? The familiar world is, for us, familiar enough. The woodworker who builds the table, the merchant who sells it, the deliveryman who carts it, and the professor who sits at it to write his letters all rightly see an ordinary, thing-like, substantial table possessing certain qualities—sturdiness, say, or a deep-brown color. The woodworker surely cared for its sturdiness, and the professor would not have bought it had it been stained a lighter color, but the table itself is what is most important. Their interest was in some *thing* and those qualities only insofar as they belonged to that thing. The woodworker set out to make a sturdy table, not to join together some desirable set of substance-neutral properties. Our professor shopped for a serviceable and attractive table, not Brown and Weight and Density joined in just the right quantities. In our everyday business, it is the non-scientific view we must prefer. So our workaday concerns and our ordinary awareness of shared qualities—that both a table and a man can be sturdy, or that both a table and the soil can be deep-brown—cannot, on its own, lead us into the physicist’s foreign territory.

The issue, as Eddington puts it, between that common sense or familiar way of understanding the table and his own, hard-won scientific view, is the table’s *thingliness* or *substantiality*. Eddington cannot be troubled to rigorously define *substance*, and for our everyday purposes, he does not need to. What is important is that *substantiality* is “the distinctive character of a ‘thing’”—

⁶¹ Eddington, *The Nature of the Physical World*, xiii.

whatever it is that makes a thing a thing.⁶² The table of our ordinary experience is just such a *substantial thing*; Eddington's scientific table certainly is not, though we cannot quite say what "it" is. "The whole trend of modern scientific views," Eddington reports, "is to break down the separate categories of 'things', 'influences', 'forms', etc.," in favor of a perfectly general system of measurement. "Whether we are studying a material object, a magnetic field, a geometrical figure, or a duration of time, our scientific information is summed up in measures" and those "measures themselves afford no ground for a classification by category."⁶³ We need not worry about fine distinctions between substances and accidents or essential and accidental properties. The "traditional picture-gallery of conceptions"—the rough metaphysical picture consistent with our ordinary experience—"convey no authentic information" and, to the contrary, only "obtrude irrelevancies into the scheme of knowledge."⁶⁴ Science prospers by freeing itself of the need, felt acutely by the non-scientist, to draw correspondences between science's abstractions and our intuitive sense of the way things are, and no where is that more consequentially true than science's abandoning of the common sense notion of species-specific thingliness. The move from everyday experience to the physicist's foreign view of things requires, then, that the phenomena be un-substantialized.

It is impossible, or at least it is very hard, to imagine the conceptual jump from our ordinary experience to a modern science of laws, expressing relationships between perfectly general measurements, without some mediating link. Aristotle's metaphysics offers a systematic way of talking, consistent with our everyday or common sense way of parsing the world, about the relationship between the underlying thing—the substance, which is primary—and the properties that

⁶² Eddington, *The Nature of the Physical World*, ix.

⁶³ Eddington, *The Nature of the Physical World*, xi.

⁶⁴ Eddington, *The Nature of the Physical World*, xi.

thing possesses. Until Aristotle divided being into substance and accident, it could scarcely occur to us to re-index experience according to the accidents common to many beings or to take those accidents as more fundamental than the beings to which they belong.

Plato's Socrates, to be sure, wondered how the same beauty could be present in the many beautiful things that, beside their beauty, had little in common. If we squint hard enough, his quest for a single cause of the many instances of the same quality could begin to look like Bacon's search for "the unity of nature beneath the surface of materials which are very unlike." But Socrates's solution, the Idea of Beauty or Beauty Itself, is more akin to Aristotle's substantial forms than Bacon's species-neutral laws. He supposes a substance—immaterial and separately existing, perhaps—to explain those many instances of beauty or justice. The shadowy beings we experience are truly articulated into natural kinds, and knowable as those kinds, just because they somehow participate in the specifically different Ideas. Aristotle's own careful distinctions between form and matter, act and potency, and essential and accidental, attempt to resolve difficulties in Socrates's solution. The properties bundled together in a single substance are not all equal. Some, the essential properties, are more fundamental and could be *said of* the whole substance or rather *to be* the substance. Together they determine *what* the thing is; they are, in the primary sense, the *nature* of the thing. Others, the accidental properties, are further specifications of the thing, determining not *what* but *how* it is. A thing's essence or nature limits and holds together, in a sense, those accidental properties.

Only once Aristotle has distinguished and hierarchically ordered the essential and accidental properties, bundled those essential properties as the substantial form, and identified that substantial form with the thing itself could Bacon propose the kind of shift of perspective that makes possible

the move from a concrete physics of “substances, with every variety of their accidents,” to an abstract physics of “accidents, through every variety of substance.”⁶⁵ In borrowing Aristotelian terms to describe that shift, Bacon betrays a measure of dependence on Aristotle’s metaphysics.

But the more telling evidence is Bacon’s own investigative procedure. For the eliminative induction he puts forward as the true method of natural science itself depends on some non-arbitrary or principled way of holding together different “abstract” “natures.” The tables of presence, absence, and degree attempt to identify in the investigation of any simple nature another “nature which is such that it is always present or absent when the given nature is, and increases or diminishes with it.”⁶⁶ What does it mean for two natures to be co-present or co-absent? In Bacon’s terms, it means the two natures are both present or both absent in the same “instance,” but the isolation of some bit of experience as an *instance* typically and crucially relies on what Aristotle would have called *substances*. Often a Baconian instance begins as a bit of ordinary experience. In his exemplary investigation of the form of heat, for example, he adduces such earthy instances as: animal hides, roses packed in baskets, hay stacked damp, horse dung, animal innards. An animal, a rose, or a grass is a unit, according to Aristotle, precisely because of the form by which each is the kind of being it is. The *substantiality* of each gives to each a degree of integrity that allows us to meaningfully distinguish what belongs to it and what does not. An animal’s hide is, in a sense, a boundary between the animal and everything that surrounds it, and it is only because we understand that animal to have movements that belong to it as a substantial whole that we can investigate how the heat present in the animal varies as the animal exercises, feasts, has sex, or experiences pain. Even in those cases where a further principle of unity other than *substantial* unity holds together a

⁶⁵ *DAS* III.4 (*SEH* IV, 347).

⁶⁶ *NO* II §15 (*OFB* XI, 253).

Baconian instance—when it is the basket that confines the rose petals or the farmer who mows the grasses, dries them, and bundles them to make hay—Bacon still relies on an essential species identification: it is a basket of *roses* or a bundle of *grass* and not something else. The weak sense of unity afforded by spatial and temporal proximity is insufficient for the inductive method because we are still compelled to make what can only be an arbitrary decision about what is close enough to count as one single instance. To uniquely correlate two natures, they must be non-arbitrarily bound together. That binding, from the side of experience, comes from our habit of dividing the world into individual, substantial beings. So Bacon’s method must, at first, at least, trade on a common sense or Aristotelian picture of the world deeply at odds with the picture we are ultimately supposed to adopt. He invites us to see the world as filled with *concrete* bodies, bodies that are nothing more than *concretions* of simple natures. But the principle of unity binding together those concretions he surreptitiously borrows from our ordinary way of taking things. Those concretions analyzed by Bacon’s method must ultimately be identified with their substantial presentation in experience.

Eddington, too, saw that his two tables “are ultimately to be identified after some fashion,” but, he demurs, it is the philosopher’s job, not the physicist’s, to say what that fashion is.⁶⁷ Eddington’s cursory remarks are not much help, anyway. His identification of the scientific table and the table of experience is at bottom a sleight of hand or an equivocation. There is, from the physicist’s perspective, really no such thing as a *table*. At the level of Eddington’s rapidly moving electrical charges sparsely scattered in empty space, the “table” is only the force of carbon, oxygen, hydrogen, nitrogen and a few other elements pushing, on balance, against the carbon, oxygen, and hydrogen atoms in the “writing paper.” Analysis of the system must account for molecular structure,

⁶⁷ Eddington, *The Nature of the Physical World*, xii.

but can ignore completely the table-like or paper-like structures that figure so prominently in our own experience. The physicist can call some arrangement of molecules a *table* and others *paper* only because he reflexively identifies, without any good account to justify his identification, the substances of his experience with the matter studied by his science.

Perhaps Bacon—who is, after all, more philosopher than physicist—can help us more exactly describe the relation between the beings of our ordinary experience and the laws discovered by his new type of science. Even if all that really exists are individual bodies and the pure, individual acts according to law, the beings of our ordinary experience cannot simply be false. What is “appearance” or “external” or “relative to man”—Bacon’s characterization of the simple natures and compounds of our experience—cannot be, as Eddington would have it, “mental imagery and inherited prejudice.”⁶⁸ For that “inherited prejudice” is the necessary starting point of modern physics and, ultimately, the world in which the physicist carries out his work. How strange it would be if, starting from an utterly false picture of the world, natural science were able to discover laws that nevertheless explained, or at least predicted with tolerable accuracy, what happens in that ordinary, illusory world.

Bacon’s ontology and his critique of human reason together explain how, nature being what it is, we could both inveterately mistake the world and yet, with the right clue, we could learn to see the world more truly. The concrete beings of our ordinary experience are compounds of simple natures and simple motions, real, but not ultimate. Our perception is scaled to those beings about our size, not their sub-sensible parts, and because our intellect is prone to rash abstractions, we habitually mistake what strikes our intellect first and most forcibly as what unqualifiedly is. We can,

⁶⁸ Eddington, *The Nature of the Physical World*, xii.

however, check our habit and, by a true anatomy, reverse the natural enfolding or compounding of nature's simples, moving with the help of reason-guided experiments from experienced complexity to original simplicity.⁶⁹ The error in our ordinary experience is not in supposing that the beings of our experience are real, but in supposing that there are principles of those beings more fundamental than the principles of those beings' constituent parts. Aristotle's substantial forms are the philosophical quintessence of such being-specific principles, and so they are the principal target of Bacon's critique. Aristotle distinguished form and matter and explained the variety of beings and their natures through distinct, formal principles. Bacon proposes to reduce those indefinitely many principles to a single summary law—the desires and appetites not of this or that kind of being, but of matter simply—and to explain the variety as the indefinitely many possible combinations of those truer principles.

So there is, in one sense, an unbroken process from simple natures and simple motions to the beings of our experience, and that unbroken process justifies holding together, as Bacon does in his pyramid image, natural history, physics, and metaphysics. The multiplicity at the pyramid's base really can be comprehended by the laws which describe the desires and appetites proper to matter, so Bacon believes. But our order of discovery or demonstration cannot be an unbroken process of analyzing what nature mingled and compounded. For in truth, *body* or *being* must be reconceived at each level of the methodical ascent from natural history to physics to metaphysics. We have already sufficiently distinguished the shift from the physical view to the metaphysical view, and we have also detailed the transformations of the notion of *substance* that the metaphysical view forces on the physical view. Those transformations set the physical view meaningfully apart from the natural-

⁶⁹ Cf. Sophie Weeks, "Mechanics in Bacon's *Great Instauration*," in *Philosophies of Technology: Francis Bacon and his Contemporaries*, eds. Claus Zittel, Gisela Engle, Romano Nanmi, and Nicole C. Karafyllis, 144 n. 50.

historical view, which is itself, as we described in the previous chapter, a modification of our “natural” view. Each of those modifications is motivated by the idea of nature informing the metaphysical view. That is, the natural-historical and the physical views *anticipate* the final metaphysical view and are shaped by that anticipation. Method, therefore, can be truly (if not exhaustively) characterized as the machinery that modulates from the “natural” to the natural-historical to the physical and, finally and most importantly, to the metaphysical view. The decisive jump from the physical to the metaphysical view takes shape as an inversion of Aristotle’s teaching about substances and their accidents, in deciding to regard accidents common to many species as more primary than the species or individual substances themselves.

That ascent from beings to laws is largely irreversible, a fact of great consequence. To get to species-neutral laws, beings possessing a substantial unity must be dissolved into a looser concretion of simpler parts. Beings, once un-substantialized, cannot easily be re-substantialized. The problem is that, in modulating from the substance-centered to the accident-centered view of beings, information is irrevocably lost, putting us at risk of the kind of forgetfulness that so worried Socrates. We saw, above, that the law or form of heat tells us nothing about the sun *qua* sun or animals *qua* animals, or that the law or form of heat is a generalization, not from hot things, but from instances of heat. While Bacon complains that the inquisition of final causes has distracted us from the more important inquiry into material, efficient, and formal causes (properly understood), it is just as true that Bacon’s refocusing of science will make us forgetful of what men like Socrates always knew, that opinions about the good are more truly causes of a man’s actions than the structure and material constitution of his bones and muscles and sinews. Or, to return for a moment to Sir Eddington, we could note that, were he to succeed in exorcising his first, ordinary table, he

would banish himself to the physicists' foreign land, sparsely populated by electrons but altogether unpeopled. Richard Kennington puts the problem more pointedly: "The notable method of Part 2 of the *New Organon* is exclusively concerned with discovering laws of nature and not with understanding the nature of particular beings such as men and their ends or goals," and so the "action' with which theory is combined is limited to the production that is feasible through knowledge of the laws of nature. It excludes knowledge of the ends or goods of human life that would guide the use of that production."⁷⁰

We need not, however, jump to the loss of human self-understanding or the eroded basis for prudent human action to appreciate the difficulties inherent in Bacon's ascent to species-neutral laws. Bacon himself points to the problem of accounting, once he has ruled out substantial forms, for the coherence of simple natures in a single concrete being. Not all combinations of simple natures are equally likely or equally stable, and Bacon cannot say what makes some combinations more likely or more stable. The physical investigation of beings in the ordinary course of nature promises more immediate practical benefits in large part because the transformation of concrete bodies does not depend on first solving the problem of making simple natures cohere, as would the attempt to construct a being "from scratch." Metaphysical investigations of individual simple natures may never reveal any such principle of coherence, whereas the actual binding of simple natures in concrete beings might provide important clues about how troops of simple natures cohere. "No one can endow a given body with a new nature or successfully and appropriately convert it into a new body unless he has acquired a good understanding of the body to be altered or transformed," Bacon warns, and being ignorant of those principles of compound bodies, "he will run headlong into

⁷⁰ Richard Kennington, "Bacon's Critique," 28.

means that are futile or at least difficult and misguided, and not suited to the nature of the body he is working on.”⁷¹ Physics, then, is more than a concession to our limitations as situated knowers or a transitional stage between ordinary experience of beings and scientific knowledge of laws. There may be a kind of intelligibility available only at the level of species, or available, at any rate, at a level lower than those perfectly general laws of matter itself. The configuration and motions of the parts of a being may act as causes in ways that are not simply reducible to the primary desires and appetites of matter itself, and physics, in Bacon’s sense, could be a stand-alone science that studied those higher-order causes.

Bacon leaves these possibilities largely unexplored. Physics distracts from what he really wants, knowledge of the appetites and desires of matter. There is a kind of knowledge that physics may more readily yield, but it is not the goal of Bacon’s contemplative eros. Contemplation as Socrates practiced it aims at a non-operative knowledge of beings, especially the first and abiding being or beings. We might think, therefore, that Bacon’s search for nature’s fundamental laws, since it largely bypasses and even problematizes a science of beings, must not be contemplative. It is true, as Kennington rightly observes, that Bacon’s quest is “for laws, which may give rise to transformations, and not the understanding of beings,” and that his ontology is “just that way of looking at beings which is most favorable to operation.”⁷² But it is also true that Bacon pursues metaphysics despite his belief that physics offers more immediate and more certain results and despite the fact that the greater power promised by a knowledge of simple natures is severely limited if we do not know how to couple them. He desires something more than operative power. For now,

⁷¹ *NO II §7 (OFB XI, 211)*.

⁷² “Bacon’s Ontology,” 41.

I will only say that Bacon's interest in transforming bodies does not rule out the possibility that he also has a contemplative interest in discovering nature's laws.

3.2 Forms and the Unity of Speculative-Operative Science

Bacon establishes, we have seen, two separate and discontinuous natural sciences, a science of beings and a science of laws. Nature, according to Aristotle, is fundamentally heterogeneous. That heterogeneity, Bacon insists, is real but secondary: Aristotle's forms are accidental effects, not essential, *per se* causes, and so cannot be reconciled to Bacon's new concept of form or law. Nature is, at bottom, homogeneous; its laws govern universally; the character or nature of nature is perfectly general. The contrast between Aristotelian substantial forms and Bacon's laws has shown us a whole new ontology supposed by Bacon's new science, an ontology that upends Aristotle's ontology, but it has not told us everything we might want to know about Bacon's forms or the science that discovers them.

To get another look, let us return to Bacon's first division of natural philosophy into its speculative and operative parts. I already hinted that Bacon's proposal for a productive or operative science represents a radical split with the Aristotelian tradition. More radical yet is the rapprochement he claims is possible between our theoretical knowledge and our practical power. "[T]he routes to human power and knowledge lie very close together and are almost identical (*coniunctissimæ, & ferè eadem*)," Bacon says.⁷³ He aims, by means of his new method, to draw them yet closer. The stakes could not be greater. Plato's Socrates expects his political reconciliation of theory

⁷³ NO II §4 (OFB XI, 203).

and practice to be met with laughter.⁷⁴ Philosophers, having left the cave and become actually wise, must return and become kings, or kings must themselves become wise philosophers. Neither Plato's Socrates nor Aristotle dreamed that theoretical knowledge would guarantee political power or power of any other kind. The coincidence of knowledge and power is a matter of chance, and should the just city come to be, we ought not expect it to last long. Bacon audaciously declares that he has discovered how to reliably unite knowledge and power and so achieve the Kingdom of Man, a new kind of polity in which self-rule (submission to method) allows man to rule over nature and become a god to other men.⁷⁵ Mastery of nature is the concept joining theoretical knowledge and practical power.

We no longer talk, as Bacon did, of *operative science* or *natural magic*. We call our vast power over nature by another name: *technology*. Technology is one thing and science, we think, another. That, at any rate, is one current and common opinion about the relation of scientific theory and technological power. Of course our technology depends on our scientific knowledge. For some time now real technological progress has developed in near lockstep with our theoretical science. We can even admit that progress in scientific knowledge often depends, in its own way, on technological progress. To take just one example: our detailed knowledge of brain physiology and the brain's chemical-physical functioning is unthinkable without the development of sophisticated imaging technologies. We will also readily concede that much scientific research is undertaken for *practical* rather than *theoretical* reasons. Only some reasonable expectation of useful technology justifies the huge public outlays for medical, military, and agricultural research. Money spent on "basic" science is a long-term investment we hope will yield a handsome, long-term return, even if we cannot say in

⁷⁴ Plato, *Republic* 473c.

⁷⁵ See NO II §52 (OFB XI, 457) with NO I §129 (OFB XI, 193-97).

advance just how or when our bets will pay off. Whatever motives originally drive scientists to their subjects, we can be sure that various systems of incentives will, on balance, direct their research programs along the most promisingly useful lines. Science as a public enterprise can satisfy our curiosity only by accident or in passing. We are only willing to pay for practical results. In actual practice, the line between scientific theory and technological practice is blurry.

Our corporate reasons for supporting science, however utilitarian, cannot decide the question of the relation between science and technology. What we do with our scientific knowledge is beside the point, the science-purist might say. Technology is the *application* of science to practical problems, and the application of science does not change the nature of science itself. The norms and procedures of a useless scientific investigation are identical to the norms and procedures of a practically useful scientific investigation. What science knows and how science knows it does not change just because some bit of knowledge happens also to meet some pressing human need. Our prudential decisions about what research to prioritize or fund cannot violate the integrity of science itself. If practical considerations influence research in an untoward way, we throw out the results. We might call it “bad” science, but we really mean that what claimed to be science was not science after all.

Still, we might wonder, why is the application of science so reliably useful? To say that technology is only the application of science is to say that the two are only accidentally or externally related, and we could only marvel at such regular alignment between achievements not essentially or intrinsically related. The coincidence has seemed, to some, more than coincidental. Perhaps it was only the two-centuries-long delay between the founding of modern natural science and the flowering of its technological fruits that tricked us into thinking the two were really separate enterprises. Our

practical need cannot explain their conjunction, for wanting our knowledge to be useful cannot make it so. Yet we might come to suspect that practical utility is nevertheless somehow built into modern science, that what looked like the application of theory to practice was really just practice all along, and not just in the sense that we prioritize research that answers our practical needs. Modern natural science's theorizing is always conditioned, the suspicion goes, not just by the demand that its results be practical, but in a way that compromises its genuinely theoretical character. Our science is not just practically motivated, but essentially practical.

Bacon's view cannot be fairly reduced to the view of either camp. Knowledge and power can be made to meet, Bacon says, but he never simply identifies the two. He rejects the ancient contemplative goal of philosophy, but he also rejects an unqualified subordination of knowledge to power. As he characteristically does when confronted with entrenched oppositions, Bacon here, too, seeks a reconciling synthesis, steering a middle course between contemplation and action. He calls that reconciliation a second *contemplative* way, distinguishing it from the ancient contemplative way in terms of its *certainty* rather than its *utility*.⁷⁶ Bacon elsewhere leads us to expect greater utility from that greater certainty—that is the reconciliation of theory and practice. The question is whether his synthesis compromises the genuinely theoretical character of his science of nature.

3.2.1 *The Anticipations of Nature Guiding Bacon's Operative Rules*

Bacon's concept of *form* or *law* is what makes the rapprochement of knowledge and power possible. The opening aphorisms of each book of *Novum organum* develop Bacon's central claim

⁷⁶ *AL* I (*OFB* IV, 31), *VT* ch. 20 (*SEH* III, 250), and *IM* Proem (*OFB* XI, 5).

about the relation between knowledge and power. Both knowledge and power depend on experience, on what we can observe (I §1). Human knowledge and human power coincide because ignorance of causes limits power, and what in thought is a cause is, in operation, like a rule (I §3). Man himself, in fact, has no power except through his ability to (knowingly) unite or separate bodies (I §4). Subsequent aphorisms in the first book explain the cause of our ignorance and so also our impotence, and Bacon promises to cure our impotence by means of a method that will cure our ignorance. The second book resumes the argument. Bacon first distinguishes the aim of power from the aim of knowledge; the good of knowledge cannot be wholly reduced to the good of power (II §1). To know truly is to know by causes, but we have botched the search for causes because we have been guided by false opinions about the character of existing things (II §2). Most importantly, forms are not, as we had believed, the primary essences of beings. Forms in this sense do not exist since nothing really exists besides individual bodies carrying out pure individual acts which are nevertheless governed by some law. That law is what Bacon means when he talks about form, and it is that law, not those illusory substantial forms or primary essences, which is the very foundation of both knowledge and operation (II §2). Incomplete power is made complete by complete knowledge: both knowledge and power are perfected by becoming perfectly general and unconstrained. Unrestricted operation follows from true contemplation, from the discovery of that most general or summary law (II §3).

This new understanding of form, prepared by a corrected ontology and Bacon's critiques, allows Bacon to unpack the gnomic connection he had drawn, in *Novum organum* I §3, between knowledge of causes and operative rules. For the wayward human mind, it is safer to allow operative practice to shape and bound the scientific search for causes (II §4). Operative practice prescribes or

suggests, at first, the standards guiding and judging our contemplative efforts. Someone who wished to generate or superinduce a new nature on a body would want a rule or recipe that was certain, unrestrained, and actionable, and this “perfect precept for operating” is the same as the perfect prescription for the discovery of true form, and “what is most useful in operating, is most true in knowing.”⁷⁷

Commenting on these same aphorisms, Kennington says that “the perfect rule of knowledge is just a restatement” of the perfect rule of operation and that “operation has already put its stamp on knowledge.”⁷⁸ He is not wrong, but Kennington misses the ways in which Bacon’s theoretical anticipations also puts their stamp on practice.⁷⁹ Consider Bacon’s interest in *certainty*.⁸⁰ Certainty, in the practical sphere, means something like *reliability*. We want a procedure that we can trust to achieve our desired result, a procedure that will not let us down. This demand for operative reliability, we might think, is the real motive behind Bacon’s attempt, by means of his method, to approach *epistemic certainty*: he wants indubitable knowledge because it is a condition of reliable power. But knowledge need not be certain to be useful. Most of our useful knowledge, in fact, is anything but certain, and were we to insist on certain rules of action or production, we would act or

⁷⁷ NO II §4 (OFB XI, 203-05). Cf. VT ch. 11 (SEH III, 235-36).

⁷⁸ Kennington, “Bacon’s Ontology,” 37.

⁷⁹ Kennington does say that from Bacon’s new “‘pragmatized’ theory there would follow by an internal necessity a new practice,” but he does not elaborate. If that new practice is “theorized” practice, he does not say so. See “Bacon’s Ontology,” 34.

⁸⁰ It is not clear just what Bacon means when he speaks of *certainty* or just how interested he is in it. He contrasts the “certain and ostensive knowledge [*certo & ostensivae scire*]” generated by his new method with the “pretty and probable opinions” that are the fruit of the old method (NO Preface, OFB XI, 59). Other times, he is careful not to pledge too much. Of his new way of contemplation, he promises only “the possibility of an outcome” and an “ending in ‘open country’” (IM Proem, OFB XI, 5). The path to that open country runs through “the woods of experience” and the journey must be “guided by the uncertain light of the sense” (IM Preface, OFB XI, 19). We must forget the false certainty of syllogistic demonstrations—a kind of “mathematical certainty” that encourages misplaced confidence while it “lets nature slip through its fingers” (DO, OFB XI, 31)—and content ourselves instead with those “degrees of certainty” established by Bacon’s new method (NO Preface, OFB XI, 53). For an overview of the question with references to representative positions, see Peter Urbach, *Francis Bacon’s Philosophy of Science* (La Salle, IL: Open Court, 1987), 43, and Robert Land, “Why Bacon’s Method is Not ‘Certain,’” *History of Philosophy Quarterly* 16, no. 2 (April 1999), 181.

produce rarely or not at all. A practical man may well wish for a *more reliable* precept, but no unbiased reflection on actual practice would suggest that the demand for certainty is anything but impractical. A farmer may wish for more reliable knowledge so he can more reliably bring in his crops, but he surely will not let his fields lie fallow while he looks for a foolproof method. The desire for perfectly reliable operative rules seems, then, to be colored by the standards of theoretical knowledge.

A similar inversion—theory putting its stamp on practice—also explains Bacon’s demand for *unrestrained* operative rules. A farmer whose plow horse comes up lame does not waste his time imagining horse substitutes or wishing he had solved the general problem of motive power. He finds someone willing to sell him a horse. A man who has or who can readily get serviceable materials, tools, and techniques has little incentive to search out other and more general means. Should he be temporarily deprived of his usual means, he looks for a temporary solution, something that will work “in a pinch.” A craftsman who set out to discover every possible way he might accomplish his craft will be, in more ways than one, a pretty poor craftsman. The development of know-how more typically consists in narrowing and perfecting than it does in multiplying tools and techniques. So again, from the point of view of unscientific practice, the demand that a rule be unrestricted makes little practical sense. Instead, the urge toward generality has more in common with the Socratic desire for theoretical knowledge of first principles.

Aristotle thought it foolish to demand more certainty from knowledge than the object of that knowledge permits, and nature, he said, is a principle that acts always or for the most part. Bacon’s demand for *reliable* and *unrestricted* operative rules make no sense if nature is as Aristotle supposed. Indeed, Bacon’s operative rules rest on his new idea of nature and especially his reinterpretation of *form*. Reliable operation requires a necessary and unique correspondence between

a nature and its law or form. When a form is present, so too is the nature, and the absence of the form guarantees the absence of the nature.⁸¹ Were the form not sufficient to produce the nature, an experimenter's desire to bring about some nature could be frustrated. Were the form not necessary to produce the nature, he could bring about a nature without wanting to. Without supposing this necessary and sufficient relation between a nature and its form or law, Bacon could not reasonably hope for reliable operative knowledge. Unrestricted operation likewise rests on an ontological assumption, in this case that "a true form is such that it draws up the given nature from some source of being which inheres in many things."⁸² Practice itself does not suggest, or does not suggest generally, that the expansion of operative power is best sought through a generalization of means. Rather, Bacon's novel path to human power is premised on his faith that all artful production and operative power comes from the binding and unbinding of universal matter's plenipotent power.

3.2.2 Theory's Transformation of Practice

Theory becomes "pragmatized," as Kennington puts it, but the practice which imprints theory is itself reshaped by theory.⁸³ Those external, "theoretical" standards imposed on practice hint at what I want to show more generally here, that the rapprochement between knowledge and practice changes the very nature of both.

That knowledge and power could be made to meet is, on one hand, perfectly obvious. We each, everyday, use our knowledge to manipulate our environment. To feed himself, man learned

⁸¹ NO II §4 (OFB XI, 203-05).

⁸² NO II §4 (OFB XI, 205).

⁸³ Kennington, "Bacon's Ontology," 34.

how to plant, cultivate, and harvest a crop and how to husband, care for, and butcher animals. He mined clays and metals and learned how to refashion these raw materials into knives and cookware. He had to learn to preserve what he harvested in the fall and transport what he grew in the countryside so that he could eat in winter and live in big cities. Know-how was the difference between starvation and a full belly. A son could inherit his father's livestock and land, but it would do him little good if he did not also learn what his father knew about their care and cultivation. That rough and ready knowledge took the form of rules-of-thumb culled from repeated trial and error. Still, the stock of know-how could, with diligence and a little luck, grow from generation to generation without ever becoming theoretical and contemplative.

Bacon's innovation is the joining of *theoretical* knowledge and operative power. In order to join the two, practice itself must be transformed. Today, to cook myself dinner, I depend on technology of a kind that the gradual development of pre-scientific know-how could never have achieved. I can buy cheap grain because agricultural scientists have engineered synthetic-nitrogen fertilizers and high-yield pest- and drought-resistant crops. The grocery store down the street stocks fresh berries or asparagus in winter, spirited by jet plane from some farm south of the equator. My beef is safely packaged, my milk is pasteurized (and fortified), and both are delivered, along with my ice cream, in a refrigerated truck. My stove top draws electricity, generated at some distant hydro-electric dam or wind farm or coal-burning plant, over a sprawling grid of high voltage wires. Teflon coats my frying pan; I scramble my eggs with a silicon spatula. A thousand generations of enterprising farmers and highly skilled artisans would not have lighted upon the genetically modified organisms, antimicrobial packaging, synthetic materials, and the electric appliances we now use to

prepare a simple meal. Almost every bit of craft and practical knowledge has been remade by biologists, chemists, physicists, and engineers.

The practice of modern natural science is different from the practical knowledge of pre-modern farmers, butchers, potters, and smiths in scope, to be sure, but also in kind. Bacon's distinction between "Experiments of Light" and "Experiments of Fruit" can help us catch sight of the novel "theoretical" character of modern technology.⁸⁴ Like those farmers, butchers, potters, and smiths, empirics and merely practical men remain always on the practical plane, moving from particulars and works to new particulars and new works. Theirs are *fruit-bearing* experiments. A fruit-bearing experiment comes to a stop with those "certain works set for it in advance," and such an experimenter, "caring nothing for investigating the truth, does not give his mind or reach out his hand to anything apart from what helps him in his work."⁸⁵

Experiments of Light, on the other hand, ascend from experiments to axioms before again descending to new particulars and works.⁸⁶ Bacon's new way of contemplation, he explains, "is not laid on the flat but goes up and down—ascending first to axioms, and then descending to works."⁸⁷ Because they search out true causes and more general axioms, these light-bearing experiments are more desirable both for their own sake and because "axioms properly discovered and established do not inform practice in a superficial but in a concentrated way, and bring floods of works in their wake."⁸⁸ To increase its power, practice must strive for something very like theoretical knowledge,

⁸⁴ See *NO I* §§99 and 121 (*OFB XI*, 157-59 and 181-83).

⁸⁵ *IM* Preface (*OFB XI*, 17-19) and *NO I* §99 (*OFB XI*, 157-59).

⁸⁶ *NO I* §117 (*OFB XI*, 175): "But my route and plan (as I have often clearly declared, and am happy to declare again) does not lead me to extract works from works, or experiments from experiments (as empirics do) but to extract (as legitimate interpreters of nature do) from works and experiments causes and axioms, and in term from causes and axioms new works and new experiments."

⁸⁷ *NO I* §103 (*OFB XI*, 161).

⁸⁸ *NO I* §70 (*OFB XI*, 113).

and the goal of expanding human power requires that practice be moved by something like a theoretical desire to know. And, as we will soon see, the descent to works serves an epistemic as well as a practical purpose.

Bacon had hit upon the rules of certainty and liberty—the same rules, I have argued, that are at once both practical and theoretical—as early as his unpublished *Valerius Terminus* (c. 1603). These rules seem motivated solely by a concern for power and utility: they are directions “to work and produce any effect.” So we may be surprised when Bacon reveals that Aristotle is their true source. Aristotle had these rules “in light, though not in use,” as axioms of science but not as directions for practice. Severed from practice, his precepts yield neither utility nor knowledge. Forms or true differences are “worthiest to be sought, and hardest to be found,” and Plato said truly that he who can divide and define deserves to be revered as a god.⁸⁹ But the ancients, haughtily spurning the help that practice offers to theory, gave up the knowledge of true forms “as impossibilities and wishes than as things within the compass of human comprehension.”⁹⁰

The discovery of true differences—a task too difficult for god-like philosophers—is the everyday achievement of more practical men. For the only way to “secure and warrant what is a true direction” or a true difference is to put an axiom to the test by making it produce. An early work, *Cogitationes de naturea rerum*, suggests in a general way how practice might put theory to the test. Democritus and Pythagoras typify the two possible opinions about the nature of atoms. They are either, as Democritus maintained, unequal or, as Pythagoras taught, equal and similar. Bacon calls in practice to judge what reason cannot: “Now the practical question which corresponds to this speculative question, and may determine it, is that which was adduced by Democritus”—adduced,

⁸⁹ *VT* (*SEH* III, 239). See also *NO* II §26 (*OFB* XI, 289).

⁹⁰ *VT* (*SEH* III, 239).

but never tried—“namely, whether all things may be made out of all things.”⁹¹ If the experimenter can truly tease into being any thing from any other thing, we should have to prefer Pythagoras’s to Democritus’s view.

But to help theory, practice must be guided by reason. While reason cannot decide the question, practice cannot, on its own, raise the question. A merely empirical experimenter could try transmuting bodies day after day without wondering about the character of the ultimate parts of bodies. So, too, a farmer could sow and reap his crops each season without asking the sorts of questions and performing the sorts of experiments that would generate the axioms that would enable him to engineer higher-yield or more drought-resistant crops. Experience itself is at best fruit-bearing. The ascent from experience to axioms requires light-bearing experiments guided by reason’s “well posed” questions.⁹²

These observations about Aristotle and Democritus are the seeds of Bacon’s more developed critique, in *Novum organum*, of the ancient order of demonstration. Socratic dialectic, like Bacon’s new method, ascends and descends. Bacon characterizes their ascent as a headlong flight from particulars to the most general axioms, but also finds fault with their injudicious descent from the fixed truth of those most general principles to intermediate axioms.⁹³ They erred twice over, ascending too quickly to the highest generalities and misunderstanding the nature and purpose of the descent. Those twinned errors have a common root: “I find,” Bacon reports, “that even those who have sought knowledge for itself, and not for the benefit and ostentation of any practical enablement in the course of their life, have nevertheless propounded to themselves a wrong mark,

⁹¹ *CDNR* II (*SEH* V, 422). Bacon reports that Democritus rejected the Pythagorean thesis not on the basis of a trial, but because he deemed it “contrary to reason.”

⁹² *CDNR* II (*SEH* V, 422). Bacon says that Democritus’s experiment, even had it been carried out, would not have settled the issue because it was not “well posed.”

⁹³ See esp. *NO* I §104 (*OFB* XI, 161-63).

namely satisfaction (which men call truth) and not operation.”⁹⁴ What we habitually call *truth* is nothing more than a subjective feeling of satiety or contentment. But our desire to know can be too easily sated; “it is much easier to find out such causes as will satisfy the mind of man and quiet objections, than such causes as will direct him and give him light to new experiences and inventions.”⁹⁵ Bacon’s more gradual inductive ascent can slow our headlong flight to the most general principles, but even the methodical ascent from particulars to axioms is unsafe until confirmed by proper descent from those induced axioms to new particulars.

Practice has been made to serve theory’s ends. Bacon’s descent, unlike Plato’s and Aristotle’s dialectical descent, does not aim to discover new axioms at all, but rather to confirm an axiom achieved in an inductive ascent by anticipating, on the basis of that new candidate axiom, new particulars. Those works and particulars serve as a pledge or warrant of our knowledge and a second check on the intellect’s tendency to feign parallels and paper over contrary instances.⁹⁶ That is, production holds us to a more rigorous standard and a sterner discipline than the mind can impose on itself. Unmethodical experience can too readily be made to conform to our prejudices, and because the mind will always be an uneven mirror, we must contrive a way for reality to hold us to account. Experiments that vex and torture nature into some new shape try, at the same time, the experimenter’s knowledge.

Is this method-governed knowledge *theoretical* or *practical*? Identifying Experiments of Light with Bacon’s genuinely speculative natural philosophy and Experiments of Fruit with his practical or operative natural philosophy, Mary Hesse suggests that it is *by turns* theoretical and practical.

⁹⁴ VT (SEH III, 232).

⁹⁵ VT (SEH III, 232).

⁹⁶ NO I §106 (OFB XI, 163-65).

“Without ‘experiments of light’ to enable true axioms to be induced, the deductive descent to new works will be limited and imperfect,” she notes, “and without the intention to produce ‘experiments of fruit’ the axioms will not be true reflections of things.”⁹⁷ She describes the need to “balance” light and fruit, but it would be truer to say that Bacon’s new way of contemplation changes the very nature of theory and practice and, at the very least, muddles theoretical and practical motives. Bacon’s point, I think, is that his new way of contemplation is always *both*, that it is a genuine reconciliation of theory and practice. Practice conditions theory, but theory also conditions practice. The amalgamated elements, still recognizable, have been transformed by the bond.

3.2.3 *A Doubt about the Theoretical Character of Bacon’s New Science*

Earlier I asked whether the new idea of form and the synthesis of theory and practice it makes possible compromises the *theoretical* character of Bacon’s science. Bacon’s reconciliation of theory and practice—practice made theoretical and theory made practical—elevates practice, putting it in service of “theoretical” goals and entrusting to it some part of theory’s work. The transformation from know-how to technology has undoubtedly led to the vast expansion of operative power. Theory, too, we must suppose, is transformed by the union, but a true accounting of our contemplative gains and losses proves much harder.

The demand that theory produce looks to some like a betrayal of theory. Kennington, for example, concludes that Bacon’s new “law of nature is not a theoretical concept” and that Bacon

⁹⁷ “Francis Bacon’s Philosophy of Science,” 117.

himself “does not intend to be a theoretical philosopher.”⁹⁸ He takes Bacon’s turn, from one aphorism to the next, from the perfect prescription for the discovery of form to the two axioms or prescriptions for the transformation of bodies as a sign that Bacon has allowed his practical goal to determine his theory. “It is because he wants to transform bodies,” Kennington argues, “that Bacon lays down his particular definition of a body,” which is “just that way of looking at beings which is most favorable to operation.”⁹⁹

If Kennington means only that Bacon is not a theoretical philosopher in the mold of Socrates or Plato or Aristotle, then Bacon would of course agree. Bacon defines his new contemplative way in opposition to the old, Socratic way. Contemplative success stakes us to greater power but, he insists, theory likewise benefits from practice’s imposition. To yoke the two, Bacon had to compel each to become more like the other. Power must aspire to knowledge and contemplation must consent to limit its own ambitions and condescend to dirty its hands. But Bacon’s discussion of Pythagoras’s and Democritus’s teachings about atoms shows that power, too, is concerned with the truth of things. All transformations are possible in principle if Pythagoras is right, but the greater power they promise is no reason to prefer Pythagoras’s equal atoms to Democritus’s unequal atoms. More fundamentally, our operative power depends on getting the true account, and the truer account has advantages all its own.

Kennington’s judgment depends on an implicit account of the character a genuinely contemplative philosophy. That Bacon abandons as hopeless and unnecessary the ancient philosophical quest for the first or eternal beings, or that he rejects the Socratic starting point in wonder about the beings of our ordinary experience, is evidence enough, for Kennington, that

⁹⁸ Kennington, “Bacon’s Ontology,” 38.

⁹⁹ Kennington, “Bacon’s Ontology,” 41. Cf. Kennington, “Bacon’s Reform of Nature,” 9.

Bacon is not a contemplative philosopher. But Kennington himself reminds us of Bacon's distinction between contemplative ways. Surely Kennington means to do more than deny the obvious. His argument is really that Bacon's new form of contemplation concedes too much to practice to remain genuinely theoretical.

3.3 Methodological Materialism

Bacon refuses to reduce knowledge to power or exclude operative knowledge from natural science proper, as if it were merely the application of pure scientific knowledge to practical problems. His reinterpretation of form binds knowledge and power together by forcing practice to take a more theoretical interest while also empowering practice to bind and judge theory. Theory inspires practice beyond its narrow concerns; practice checks theory's impetuous flights to what is first or final, creates new objects of contemplation, and compels theory to attend to things vile, illiberal, and commonplace. In the previous section we saw that, for power and knowledge to meet, practice must undergo a radical change, must become more contemplative. Along the way, we caught a glimpse of the similarly radical transformation contemplation must suffer in order to accommodate practice's demands. We ended with a question about the contemplative character of Bacon's new science. To get closer to answering it, let us now consider the nature of Bacon's new form of contemplation.

3.3.1 Bacon's Critique of Democritus

Bacon's instauration is built on a critique: we do not know all that much, and our ignorance is the chief cause of our impotence. The brunt of that critique falls, first, on the Socratic starting point in the speeches and opinions that are first for and better known to us and, second, the precipitous ascent from those starting points to those first principles that are better known by nature. Trusting in the mind's ability to grasp nature, Plato and Aristotle developed a metaphysics and a natural science that emphasized non-material principles and supposed Mind and Form as first and final causes.

Against Plato and Aristotle, Bacon usually takes sides with those "Presocratics" whose attempts to explain the world without any reference to mind or the good begat Socrates's search for a second-best method.¹⁰⁰ Theirs is the weightier and more solid philosophy that sank because it did not find popular favor, while time carried to us Plato's and Aristotle's lighter and more fashionable philosophies. The Presocratics' more solid philosophies "have penetrated further into nature than that of Plato and Aristotle," Bacon judges, "for the single reason, that the former never wasted time on final causes, while the latter were ever inculcating them."¹⁰¹ The Socratic corruption of philosophy by superstition and theology, more obvious in Plato's thought than Aristotle's, serves as a summary critique: unable to bring their search for first causes to any satisfactory conclusion, they resorted to final, "theological" causes. Better were those Presocratics "who removed God and Mind from the structure of things, and attributed the form thereof to infinite essays and proofs to nature .

¹⁰⁰ John McCarthy rightly points out that the term *Presocratic* is, in this context, "doubly anachronistic." He also convincingly shows why it makes sense to use it anyway. See "Bacon's Third Sailing: The 'Presocratic' Origins of Modern Philosophy," 168-69.

¹⁰¹ *DAS* III.4 (*SEH* IV, 363-64).

. . and assigned the causes of particular things to the necessity of matter, without any admixture of final causes.”

Among those more penetrating students of nature, Bacon singles out Democritus for special praise. Yet for all his encomiums to the atomist from Abdera, Bacon is not Democritus’s disciple. We have focused on Bacon’s critique of Socratic philosophy, but to get a complete picture of Bacon’s science, to grasp the true scope of his critique of ancient contemplation, and to appreciate the surprisingly Socratic character of Bacon’s own philosophizing, we must also consider his critique of the Presocratic materialists, Democritus especially.¹⁰²

Bacon’s apparently contradictory statements about atomism make it hard to identify the nub of his disagreement with Democritus. He opens his early, unpublished fragment, *Cogitationes de naturarum* (before 1605?), with cautious praise: “The doctrine of Democritus concerning atoms is either true or useful for demonstration.”¹⁰³ Against Democritus’s critics, he concludes that “there is no reason why in the regions of the air . . . there may not be also a collected vacuum.” Yet some fifteen years later, in *Novum organum*, he announces that “this business”—the new science of nature—“will not be brought down to the atom, which presupposes a vacuum and invariable matter (both false assumptions), but to real particles as we actually find them.”¹⁰⁴ His position on the possibility of a vacuum certainly looks like an about-face. Bacon, it seems, changed his mind.

¹⁰² In *DPAO*, Bacon treats Democritus as the principal opponent of Socratic philosophy. Without mentioning Socrates, Bacon pictures Aristotle’s “furious assaults” and Plato’s “majesty and solemnity” as varied attempts to “obliterate this philosophy of Democritus.” See *DPAO* (*OFB* VI, 205).

¹⁰³ *CDNR* I (*SEH* V, 419).

¹⁰⁴ *NO* II §8 (*OFB* XI, 213).

But Bacon was never really an atomist, and the question of the vacuum is not what is really at issue.¹⁰⁵ He faults Democritus for neglecting the “composition and configuration” of bodies, suggesting that “contemplative prudence [*Prudentia contemplativa*]” requires alternating between his own, analytic approach that penetrates to nature’s simplicity and a more synthetic or “comprehensive” approach focused on the composition of nature’s simples.¹⁰⁶ This more methodological objection comes closer to the mark and hints that Democritus, too, is guilty of certain contemplative excesses.

But Bacon’s real complaint is that Democritus betrays his own best insight. “*Democritus* made the admirable claim that atoms or seeds, and their virtue, were quite different from anything subject to the senses,” but when he talks about the atom’s motion, “*Democritus* is not only quite at odds with the parable [of Cupid, which Bacon presents as a more ancient teaching about the atom], but also at odds and virtually in contradiction with himself.”¹⁰⁷ Atoms, Democritus said, “do not resemble fire or anything else” that “can send bodies to our senses or be felt by our sense of touch,” and so “in giving birth to things the first beginnings ought to hold to a secret and dark nature.”¹⁰⁸ Because atoms are unlike perceptible bodies, Democritus “ought to have attributed a heterogeneous motion

¹⁰⁵ According to Kennington, “Bacon was always a materialist, but never an atomist. Atomism was for him another example of the hubris of ancient Greek philosophy, which claimed to know what was ultimate in the universe.” See “Bacon’s Reform of Nature,” 10. But cf. Kennington, “Bacon’s Ontology,” 39. Rees likewise concludes that Bacon was no atomist, but on the grounds that atomism is inconsistent with his speculative philosophy. Additionally, Rees shows that the atoms of Democritus or Lucretius are far too inert to be reconciled with the restlessness and appetitiveness that characterize matter in Bacon’s view. See Rees’s “Atomism and ‘Subtlety’ in Francis Bacon’s Philosophy” and “Matter Theory: A Unifying Factor in Bacon’s Natural Philosophy.”

¹⁰⁶ *NO I* §57 (*OFB XI*, 91). Bacon uses the term “contemplative prudence [*Prudentia contemplativa*]” in the following aphorism.

¹⁰⁷ *DPAO* (*OFB VI*, 201-203).

¹⁰⁸ *DPAO* (*OFB VI*, 203). Bacon attributes these quotations to Democritus, but he takes them from Lucretius, *De rerum natura* I.

to the atom no less than a heterogeneous body and a heterogeneous virtue.”¹⁰⁹ By attributing the same motions to composite and simple bodies, Democritus violated his own heterogeneity principle.

Though he does not stay true to it, Democritus’s heterogeneity principle was a genuine advance. Recognizing that the primary stuff of nature must underlie contraries, Thales and Anaximenes chose “intermediate natures”—water and air, respectively. Heraclitus “more acutely but less credibly” chose fire as his element, preferring “an exalted and perfect” nature that might unify nature as “the end of corruption or alteration.”¹¹⁰ But Thales, Anaximenes, and Heraclitus cannot adequately account for natures contrary to their single principles without making water, air, or fire “fantastical,” sharing the name but not the definition of its “natural” counterpart.¹¹¹ Water or air or fire can be a true principle only if it is unlike the water, fire, and air of our experience. Here is Democritus’s heterogeneity principle honored too late or in the breach.

Bacon often praises the Presocratics’ greater fidelity to experience and more penetrating inquiry into nature, but he also says that “these ancients do not seem to have adopted a very shrewd way of going about the investigation of principles.”¹¹² Thales, Anaximenes, and Heraclitus, “observing nature simply, not contentiously,” proceeded to “seek out from visible and manifest bodies the one which was the most excellent, and whatever measured up they set down as principle of all things.”¹¹³ Their principles were not fetched out of experience; instead they called on a naïve or unmethodical experience only to find something that would answer to their dogmatic notions. Again, “they do not find out, indeed they do not even invent anything to explain by what appetite or

¹⁰⁹ *DPAO* (*OFB* VI, 203).

¹¹⁰ *DPAO* (*OFB* VI, 217-19).

¹¹¹ *DPAO* (*OFB* VI, 225). Bacon describes another strategy that is essentially the same: “But by far the greatest error is that they constitute a principle corruptible and mortal. For they do this when they bring in a principle such as deserts and sheds its nature in composite bodies.”

¹¹² *DPAO* (*OFB* VI, 221).

¹¹³ *DPAO* (*OFB* VI, 219-221).

provocation, or by what cause, means or leading, that principle of theirs degenerates from itself, and on the other hand recovers itself again.”¹¹⁴ They neglect those intermediate causes, that just scale of ascent, that could rigorously link our experiences to their dogmatically asserted principles.

Indeed, Thales, Anaximenes, and Heraclitus are guilty, if to a lesser degree, of the original Socratic contemplative sin: from the experience of a few particulars, they flew up to the first and highest principles. In their case, that precipitous flight could even look like an inversion of the Socratic order of demonstration, for the ascent is so quick and its starting point so little remarked that they could seem to begin from what is first and better known by nature and proceed from those principle to what is first and better known to us. “[T]o suppose that all these [contraries] spring from some one source of material stuff”—that’s their precipitous jump to a first principle—“but still not disclose any of that stuff’s mode of action”—to leave out all the intermediate causes—seems, Bacon concludes, “a kind of frantic (*attonita*) speculation and a giving up of inquiry.”¹¹⁵ The argument against Thales, Anaximenes, and Heraclitus is generalizable: any thinker who, neglecting the rule of heterogeneity, supposes one material principle with some form “substantially homogeneous with the form of any of the secondary entities” is guilty of a contemplative immoderation very like Plato’s and Aristotle’s.¹¹⁶

By this standard, Democritus, too, is guilty. “For although he [Democritus] was most acute and diligent,” Bacon says, “this man’s reflections still ran away with him and they could not keep within limits or enough of a tight rein on themselves.”¹¹⁷ The stern judge’s verdict condemns not just Democritus’s attribution of the motions of ascent and descent to his atoms, but his atomism

¹¹⁴ *DPAO* (OFB VI, 223).

¹¹⁵ *DPAO* (OFB VI, 223).

¹¹⁶ *DPAO* (OFB VI, 219).

¹¹⁷ *DPAO* (OFB VI, 197-199).

simply. Because there is an unpierceable veil between our experience of composite bodies and nature's first, imperceptible bodies and their motions, Democritus could not know what he claims to know about those bodies.

These later critiques help us reframe what seems, in Bacon's earlier fragments, like an endorsement of atomism. I quoted, above, Bacon's hedge about Democritus's atomism, that it is either true or useful. The sentence that follows discreetly drops the possibility that atomism is true, asserting only that "the genuine subtlety of nature" is hard to grasp and express "without supposing an atom."¹¹⁸ The "irresistible necessity" that drives men's thoughts to the atom may point to a limitation of reason rather than a truth about nature, and the mind's untutored tendency toward atomism is, for Bacon, cause for suspicion, not evidence in atomism's favor.¹¹⁹ Bacon then sets about quietly moderating atomism's immoderation, substituting for it a philosophy "more severe, sober and settled" than Democritus's own.¹²⁰ Democritus's true or useful doctrine teaches that an atom is "the last term or smallest portion of the division or fraction of bodies," but only this much "may be safely and certainly laid down," that things really are more subtle than our senses—a pinch of saffron can suffuse and color a whole hogshhead of water—but neither infinite nor perpetually divisible, since that same pinch cannot color ever larger volumes of water.¹²¹ Experience warrants only this more modest claim, whereas unqualified atomism is a theory that outruns experience or, as he puts it in a later fragment, is another of those "excursions of the mind beyond the bounds of nature."¹²²

¹¹⁸ *CDNR* (*SEH* V, 419).

¹¹⁹ *DPAO* (*OFB* VI, 253).

¹²⁰ *DPAO* (*OFB* VI, 197).

¹²¹ *CDNR* I (*SEH* V, 419-20).

¹²² *DPAO* (*OFB* VI, 199).

Not all forms of contemplative immoderation are equally blameworthy, though, and Bacon clearly prefers Democritus's atomism to Aristotle's abstract prime matter. He prefers, in fact, almost any of the Presocratics' speculations to Plato's and Aristotle's because they all, or almost all, "were as one in maintaining that matter was active, had some form and imparted its form, and had the principle of motion within itself."¹²³ They were, in the ways that mattered to Bacon, all materialists. Plato and Aristotle, on the other hand, gave to forms "all the best parts" and demoted matter to a mere "accessory and substrate."¹²⁴

Those substantive differences parallel an important methodological difference: where Democritus and the Presocratics analyzed or dissected nature, Plato and Aristotle abstracted it. "But," Bacon counsels, "one who philosophizes rightly and in an orderly manner must dissect nature and not abstract from it (for those who will not dissect it are forced to abstract)."¹²⁵ To abstract from nature is to "ask how we may in thought comprehend or distinguish the nature of entities with the least trouble." To abstract, that is, means to suppose that those distinctions most agreeable to our way of thinking must be nature's real distinctions. We move from the experience of concrete bodies to abstract, notional, and inert principles like Aristotle's prime matter or, worse, altogether *immaterial* principles. To dissect nature, by contrast, means "to ask what in reality the primary and most simple entities are from which the rest are derived," to decompose a concrete body into its real, active, and *material* parts since "entities cannot be made out of things which are not entities, nor principles out of things which are not principles."¹²⁶

¹²³ *DPAO* (OFB VI, 209).

¹²⁴ *DPAO* (OFB VI, 207).

¹²⁵ *DPAO* (OFB VI, 209).

¹²⁶ *DPAO* (OFB VI, 209 and 253).

In short, then, Anaxagoras, Leucippus, Democritus, Parmenides, Empedocles, and Heraclitus's material principles all have "something of the natural philosopher about them and smack of the nature of things, experience and bodies," whereas Aristotle, even in his natural philosophy, "usually rings out with little more than the terms of dialectic."¹²⁷ Democritus gives us matter; Aristotle only words. Where Plato and Aristotle abstracted their principles from a few particulars, Democritus and the others, starting from a similarly narrow experience, analyzed bodies into their material constituents. Both motions, abstraction and dissection, can be carried too far, too fast. The whole lot—Democritus no less than Plato and Aristotle—indulged in a contemplative flight, but Democritus at least flew in the right direction.

But Plato and Aristotle enjoyed this advantage, that they could give some account of how thought should move from appearances to principles and elements. Socrates's account of his second-sailing proposes a dialectical movement from speeches about beings to the Ideas that are causes both of those beings and our knowledge of them. The ascent depends on a certain likeness between appearance and principle, a likeness he emphasized in calling those principles *eide*.

Democritus cannot make a similar appeal to his own principles to explain his working procedure. The principle of heterogeneity calls into question the Socratic and the Presocratic starting points alike, as well as any "order of demonstration" that promises to cross the divide between appearances and principles. It draws a veil between nature itself and nature as we experience it. "[A]s Democritus himself said, no one ever saw or can see" an atom, and we have no warrant for analogizing from what is perceptible to what is imperceptible.¹²⁸ We only ever see the mask nature

¹²⁷ NO I §63 (OFB XI, 99).

¹²⁸ CDNR I (SEH V, 419). Bacon defends Democritus's use of similitudes for the purpose of teaching novel doctrines. See DAS VI.2 (SEH IV, 452).

wears, not nature itself; our experience is of *natura naturata*, never *natura naturans*. If nature's principles are radically unlike the entities of our experience, we cannot hope to work back to them from those experiences or speeches that are first for us. Neither can we hope to begin with nature's principles and work our way to the familiar beings of our experience. So Democritus cannot adequately account for his own insight about atoms. His atomism is neither securely founded on experience nor able to account for it in any detail.

The upshot of Bacon's critiques of Presocratic natural philosophy and the Socratic attempt to correct Presocratic natural philosophy is this: materialism is a basically true account of the world, or at least the account that should guide our inquiries, but theoretical materialism is untenable. No science could rigorously establish, on the basis of experience alone, the truth of the materialist claim about what really is. The Socratic beginning in speeches points in the wrong direction, concluding in sophisticated or theologized philosophies, but at least it acknowledges the need for an ascent from opinion and experience to knowledge of principles. Democritus somehow divined truer principles, but his most important insight made an ascent to those principles impossible, and so, too, a descent from those principles to works. Democritus's atomism is no less theoretical, in Bacon's pejorative sense, than Plato's or Aristotle's natural philosophy. What Bacon wants (though he never quite puts it this way) is to open up his own middle path, to find some way to combine the Socratic ascent from what is first for us with a more Democritean conclusion about what is first by nature. Bacon's method promises a kind of reconciliation, a new way to conceive the starting point and order of demonstration that will lead us to matter rather than form. To join the two, Bacon must reinterpret the Socratic dialectical ascent as *method* and trade Democritus's *theoretical* materialism for what I will

call a *methodological* materialism. The key to both these transformations is his new concept of form or law.

3.3.2 *Form as the Non-Ultimate, Non-Arbitrary Conclusion of Natural-Philosophical Inquiry*

Ancient philosophy had an obvious conclusion: inquiry could stop when it reached what is first or final. Once we give up the search for what is first and final, it is much less clear when inquiry should come to an end. *Form* or *law*, I submit, is the non-arbitrary but non-ultimate terminus of inquiry that allows Bacon to sail between the Scylla of skepticism and the Charybdis of dogmatism, an intelligible “methodological principle” that mediates between unknowable matter and unintelligible experience and breaks off inquiry before reason can outrun its competence. Because the veil drawn by the heterogeneity principle cannot be pulled aside by reason’s most strenuous exertions, inquiry must stop at the threshold where nature itself becomes nature as we experience it. Form is the point of contact between nature *ex analogia univ[er]si*—the real bodies, whatever they may be, and their acts—and nature *ex analogia hominis*—those simple “natures” that are the elements of our experience.

To get a better look at this aspect of Bacon’s forms, let us begin by asking how we come to know first principles. “Rightly do they say that *to know truly is to know by causes*,” Bacon affirms. We say we know a thing when we have discovered what is responsible for the existence and character of a being or a state of affairs. Inquiry traces out causal chains: a full account would identify not only the proximate causes, but also the causes of those causes and so on until it reaches a first, uncaused

cause. That first cause or principle, since it is uncaused, cannot be known in the same way, through its causes. Thus knowledge of first principles must be positive.

So far, Bacon and Aristotle agree. Bacon parts ways with Aristotle, however, in answering two fundamental challenges raised by the positivity of first-principle knowledge. The first problem demands an account of how we know first principles since we do not know them through prior causes. For Aristotle, that positive knowledge of principles is self-evident, the result of *noetic insight*. We somehow intellectually “see” the truth of the principle. The second problem concerns the dependence of all knowledge on knowledge of first principles. To know some x , I must know the cause of x , and to know the cause of x , I must know the cause of the cause of x , and so on all the way back to a first, uncaused and self-evident cause. Knowledge in the full and strict sense therefore requires an ascent all the way to a first principle, and the certainty of all knowledge rests finally on the certainty of positive, first-principle knowledge.

From the vantage point of Bacon’s critique of human reason and his teaching about the hiddenness of nature, Aristotle’s account of first-principle knowledge looks hopelessly naïve.¹²⁹ The Socratic insight into our need to begin with what is first for us would seem to call into question the trust that we have self-evident knowledge, of all things, of what is first by nature. And to ground any claim to knowledge ultimately on the most remote and most difficult knowledge is, in the end, a counsel of despair. Science is at once too credulous and hopelessly exacting. Here is the basis of Bacon’s complaint that philosophy has so far too recklessly granted or withheld assent, and so, too,

¹²⁹ “But only to God (the creator and planter of forms), or perhaps to the Angels and Intelligences,” Bacon needles, “does immediate knowledge of forms by affirmation belong as soon as they begin thinking about them,” NO II §15 (*OFB* XI, 253).

his prescription for a science that finds an appropriate middle ground between dogmatism and skepticism.¹³⁰

Bacon, for one, will gladly trade the dogmatists' empty promise of complete knowledge for a more humble, more practical sort of knowledge: "it is better to know what we need to and yet not to think that we have complete knowledge, than to think we have complete knowledge and yet to know nothing that we need to."¹³¹ If we will forswear the philosophers' dream of knowledge, we can have knowledge that is genuinely useful and also better guarded against the skeptics' attacks. Made to slow down, reason can for the first time appreciate the utility and satisfaction to be found in those middle axioms and may even come to doubt whether the most remote axioms are worth our trouble. And Bacon's more gradual, more moderate route will substitute Aristotle's self-evident principles for principles made plausible by the procedure that discovered them, that vouch for their own truth indirectly, by suggesting new particulars and new works. If we can know an effect through its cause, why can't we also know a cause by its effect? That epistemic reversal is, more or less, the real meaning of Bacon's attempt to replace a deductive natural science—a science that moves from principles or causes to effects—to an inductive natural science that moves from effects to causes or principles. Inductive knowledge of those principles admits of degrees: we can know them with more or less certainty.¹³² The greater scope, utility, and resilience of such probable knowledge more than compensates the loss of deductive certainty.

But the principles known by Bacon's method cannot be nature's first principles. Any account of knowledge must also square with the inviolable limit imposed by the rule of

¹³⁰ *NO* I §67 (*OFB* XI, 107-109). Cf. *NO* Preface (*OFB* XI, 53) and *NO* I §75 (*OFB* XI, 119-21).

¹³¹ *NO* I §126 (*OFB* XI, 189-91).

¹³² See, for example, *NO* II §19 (*OFB* XI, 261).

heterogeneity. Whatever intellectual tools and processes we bring to the task of inquiry, we cannot get behind the appearances of things to the things themselves. Aristotle could have agreed that of “matter itself, its power and nature, and in fine the principles of things . . . there can be no cause in nature,” and so it “must be taken just as it is found,” as “a thing positive and beyond rational explanation.” Bacon goes farther. It is, by definition, a mistake to seek some cause prior to the first cause, but it is also a mistake, Bacon says, to seek what is truly first. We ought to give up “striving after things still better known to nature” and end our inquiry instead with what is “most universal according to experience,” embracing those highest generalities—not those first beings—as “a positive doctrine” or “articles of experimental faith.” Democritus discovered this limit by reason, but we Christians can also know by faith that “*man cannot discover the work which God hath worked from the beginning to the end,*” that “the highest law of essence and nature, which cuts and passes right through the vicissitudes of things” is beyond man’s ken, the sort of thing that “can touch the human mind fleetingly but cannot really enter it.”¹³³

Bacon’s reinterpretation of form aims to honor the rule of heterogeneity violated by the Socratic notion of form. For Plato and Aristotle, intelligible form is the noetic “look” that accounts for a concrete being’s appearance. They maintained a real distinction between form and appearance—form is responsible for, but not identical to, the being it in-forms—while insisting on a genuine if imperfect likeness between the two. Bacon blurs or collapses that distinction and forces form to take on a double aspect. In one aspect, form is the law governing the pure, individual acts of subsensible bodies, the “force impressed [*indita*] by God on the primary particles,” or what Bacon

¹³³ *DPAO* (OFB VI, 201).

sometimes calls the *appetites* [*appetitus*] or *instincts* [*stimulus*] of matter.¹³⁴ In its second aspect, the form is just the sensible manifestation of the law-governed motions of those subsensible bodies, what Bacon calls a “nature” or a “simple nature.”¹³⁵ Form is both reality and appearance, or form just is the way things themselves look to us. Bacon puts it thus: “the form of the thing is the very thing itself [the manifest nature], and the thing [the manifest nature] does not differ from the form in any other way than appearance from existence, external from internal, or that relative to man from that relative to the universe.”¹³⁶

Forms straddle the divide between things themselves and appearances but not, as you might think, as the crucial link that makes possible inferences from experience to whatever stands behind experience. Instead, the inquiry into forms remains wholly on the side of manifest natures. Form describes a relation between two natures: the form of a given nature is *another nature*, more general than the first. “[N]o nature,” Bacon says, “can be taken for the true form unless it always diminishes when the [correlated] nature diminishes, and likewise always increases when the [correlated] nature itself increases.”¹³⁷ The constant relation between two natures that Bacon calls *form* is the same relation he described as “a true and perfect precept for operating” as well as “a true and perfect axiom for knowing”: “*that there be discovered another nature which is convertible with the given nature, but which is nevertheless a limitation of one better known to nature like a true genus.*”¹³⁸

¹³⁴ See NO II §2 (OFB XI, 203) with DPAO (OFB VI, 201) and DSV “Cupid, or the Atom” (SEH VI, 729). In DSV, Bacon also talks about “the natural motion of the atom [*motus naturalis Atomæ*]” as the “original and unique force that constitutes and fashions all things out of matter.”

¹³⁵ See Kennington, “Bacon’s Ontology,” 36. Cf. Antonio Pérez-Ramos, “Bacon’s Forms and Maker’s Knowledge,” 105. Pérez-Ramos sees that “Form points to that invisible arrangement which can account for them [properties or ‘natures’],” but misses this second aspect of form as sensible manifestation.

¹³⁶ NO II §13 (OFB XI, 237).

¹³⁷ NO II §13 (OFB XI, 237).

¹³⁸ NO II §4 (OFB XI, 205).

We can take as an illustration Bacon's "provisional interpretation" of the "first vintage" of the form of heat. After reminding us of the postulate that ties one form uniquely to one nature, Bacon (provisionally) concludes that motion, limited or constrained in a particular way, is the form of heat. Or "this motion" is "like a genus to heat's species," not the cause that begets heat but "heat itself": the "*Quid ipsum* of heat is motion and nothing else" and heat differs from motion only by being limited, by Bacon's count, by four specific "differences."¹³⁹ Bacon makes the initial identification of heat and motion on the strength of his tables of presence, absence, and degree, on the strength, that is, of his lists of co-incident *natures*. "Each and every *Instance* indicates that the nature of which heat is a limitation is motion," he asserts.¹⁴⁰ But the kind of instances he has in mind are the dancing of a flame or the bubbling of a boiling liquid—the perfectly obvious and ordinary "juddering motion, forever shaking, straining, and struggling"—not the kind of motion that could be, in conformity to the rule of heterogeneity, predicated of matter itself or atoms or any other true material principles.¹⁴¹ The motion which is heat belongs not to the body as a whole, but to "its smaller particles," yet Bacon in no way suggests that these smaller particles are in any way ultimate.

His investigation into the form of heat does not even try to penetrate to matter's ultimate parts. "Now this business will not be brought down to the atom," Bacon announces, "but to real particles as we actually find them." What those real particles are, Bacon never says. Instead, he says that "the more the investigation touches on simple natures, the more will all things be put in the open and plain view; the matter being converted from the manifold to the simple, from the incommensurable to the commensurable, from the irrational to the computable, from the infinite

¹³⁹ NO II §20 (OFB XI, 263-71). Heat is a motion that is (1) expansive, striving toward "self-dilation," and at the same time (2) a local motion upwards; that motion belongs (3) not to the body as a whole, but to its "smaller particles," and (4) the motion of those particles is "rather rapid and not at all dull."

¹⁴⁰ NO II §20 (OFB XI, 263).

¹⁴¹ NO II §20 (OFB XI, 269).

and vague to the definite and certain.”¹⁴² Combined with what he said earlier about the construction of a “true and perfect axiom for knowing,” it is hard not to read this aphorism as Bacon’s concession that his method will not reach, will not even attempt, in fact, to reach what is simply first in nature. The analysis or dissection ends not with atoms or nature’s true particles, but with a hierarchy of natures. Bacon’s method concludes at those simple natures that function as *methodological* primordia.

Bacon likens those simple natures to the letters of the alphabet. He proposes, for example, a “history of those very virtues which (I say) can be regarded as cardinal in nature and which clearly constitute the primordia of nature and, indeed, the primary passions and desires of matter.”¹⁴³ These natures—“*Dense, Rare, Hot, Cold, Consistent, Fluid, Heavy, Light*, and quite a few others besides”—are the true “primordia” of Bacon’s science.¹⁴⁴ That they can *be regarded* as cardinal suggests that they are not cardinal in fact. Appetitive matter—matter that has its own, internal principle of motion—is the true but unknowable principle behind these contrary natures. The only purchase we have on matter itself is our experience of those manifest natures. Bacon postulates a unique and necessary correspondence between forms and natures. That postulate guarantees that any instance of a nature can be taken as evidence of the presence of the form—that is, the law governing the action of individual bodies—and, vice versa, that the absence of a nature can be taken as evidence of the absence of the form. But form’s mediating role between matter itself and manifest nature can only be a methodological assumption. Bacon’s inductive method, beginning with the tables of absence, presence, and degree all the way through the instances with special powers (and presumably also

¹⁴² NO II §8 (OFB XI, 213).

¹⁴³ DO (OFB XI, 39).

¹⁴⁴ DO (OFB XI, 39).

those promised aids to true induction that Bacon never got around to describing), depends on contradictory instances to make exclusions.¹⁴⁵ Eliminative induction itself, because it presupposes a unique and necessary correspondence between form and nature, could never unearth evidence of that correspondence.

We experience a multiplicity of primary natures that have a common root, so Bacon supposes, in appetitive matter. Matter's unifying function underlies another guiding metaphor: Bacon's likening of nature and the sciences of nature to a pyramid.¹⁴⁶ At the base of the pyramid are the indefinitely many individual beings cataloged in Bacon's natural and experimental histories. The natural philosopher ascends from those particulars to axioms of greater and greater generality. Each level of the ascent comprehends in fewer axioms the whole multiplicity beneath it. The ascent concludes at the pyramid's vertical point, in "the summary law of nature."¹⁴⁷ It is worth considering a tension between these two guiding metaphors, the summary law at the point of nature's pyramid and the alphabet of simple natures that are the building blocks of all the compound natures we experience. Bacon, so far as I know, never says that the alphabet of simple natures can be reduced to some single *nature*. The alphabet image likewise suggests that, just as there is no ur-letter to which the letters of the alphabet can be reduced, there is no single "most primary" nature into which the other simple natures can be resolved. Nature, insofar as it is manifest to us, is irreducibly multifarious. The promise of some underlying unity comes only from the side of matter itself. Perhaps it was a need to reconcile these two visions that led Bacon, in *Novum organum*, to suggest that the summary

¹⁴⁵ See NO II §21 (OFB XI, 273) for a list of "other aids to the intellect in the *Interpretation of Nature* and true and perfect *Induction*."

¹⁴⁶ See AL II (OFB IV, 85) and DAS III.4 (SEH III, 362).

¹⁴⁷ DAS III.4 (SEH IV, 362).

law itself has clauses, imputing a kind of multiplicity to his single principle.¹⁴⁸ More importantly, though, it is Bacon's reinterpreted forms that negotiate between what you might call nature's real simplicity and its phenomenal multiplicity.

3.3.3 Bacon's Reconciliation of Democritean Materialism and Socratic Dialectic

The tension in these two images between nature's simplicity and its phenomenal multiplicity provides an important clue about Bacon's attempt to draw together Democritean materialism and the Socratic ascent from opinion and experience. Democritus professes a *theoretical* materialism, a teaching about what is first by nature, that no ascent from what is first for us can justify because, as Democritus himself taught, nature's principles are heterogeneous with nature as it appears to us. Socrates's second sailing was an imperfect correction of Presocratic speculation. He abandoned the material principles in favor with Democritus and others for the sort of "theological" or "sophistical"—and above all *immaterial*—principles that allowed his dialectical ascent from experience and opinions. To marry Democritus's materialism to Socrates's ascent from experience, Bacon must impose certain limits. Starting from experience, we must end with experience. We can artificially extend our experience with instruments and experiments, but no expansion of our experience will give us access to matter itself. We can only assume a connection between the natures we experience and matter that underlies them. In granting that the connection is only an assumption, we concede the theoretical character of any claims we make about the underlying matter. We can be materialists, but only *methodological* materialists.

¹⁴⁸ NO II §4 (OFB XI, 203).

To better understand what I mean by calling Bacon's materialism *methodological*, it will help to compare Bacon's statement of the problem and his solution with Kant's. If Bacon's reasons for denying the possibility of knowing things in themselves are not quite Kantian, his solution moves in a Kantian direction. That, at any rate, is how Kant reads those "ingenious proposals" by which, he says, the Lord Chancellor "partly initiated" and "partly inspired" the "intellectual revolution" that made possible a genuinely scientific science of nature.¹⁴⁹ Both Bacon and Kant begin with a general critique of human reason, and both interpret the lack of progress and consensus as a sure sign that we must begin again and set reason on a better and more secure path, a path that both humbles the overconfident dogmatists and escapes the skeptics' "complete anarchy." Both fault reason's restlessness, the "peculiar fate," as Kant puts it, or "the very nature of reason itself" that compels it to ask questions it cannot answer.¹⁵⁰ And both seek to cure reason by curbing its immoderate desire, by persuading reason to forsake its hopeless search for impossible knowledge and be contented with what knowledge it can legitimately have. Reason must learn its limits and stay within them, or reason must impose on itself a new discipline and give itself a new law to bring about "a lawful end and termination of limitless error."¹⁵¹

To constrain reason, Kant erects a new boundary stone: reason legitimately ranges over everything *phenomenal* but turns trespasser as soon as it tries to cross over to the *noumenal*, to things-in-themselves. The border between the *phenomenal* and the *noumenal* corresponds very roughly to the division established by Democritus's rule of heterogeneity.¹⁵² That we can say precisely nothing

¹⁴⁹ Immanuel Kant, *Critique of Pure Reason*, trans. Norman Kemp Smith (New York: St. Martin's Press, 1965), 20.

¹⁵⁰ Kant, *Critique of Pure Reason*, 7.

¹⁵¹ *IM* Preface (OFB XI, 25).

¹⁵² That divide is not, as it is for Kant, primarily epistemological, a consequence of our mental equipment. Rather, Democritus (as Bacon interprets him) insists on the divide on ontological or natural-philosophical grounds,

about things in themselves is the condition, for Kant, of any natural science: the given is knowable, insofar as it is knowable, because reason itself is both giver and receiver. Kant's famous Copernican revolution amounts to this, that objects must conform to our knowledge, not the other way around. Because reason itself constitutes the objects of its experience, it cannot penetrate to the unknowable thing in itself. Peel away all reason's *a priori* determinations of the object and no predicates remain. As far as theoretical reason is concerned, *noumena* is a radically empty concept.

Kant thinks that his revolutionary principle is already implicit in Bacon's new method. Along with Galileo and Torricelli and Stahl, Bacon "learned that reason has insight only into that which it produces after a plan of its own, and that it must not allow itself to be kept, as it were, in nature's leading-strings, but must itself show the way with principles of judgment based upon fixed laws, constraining nature to give answer to questions of reason's own determining."¹⁵³

The question is, what is the nature of reason's self-produced plan? For Kant, all experience is from the very beginning conditioned by reason's categories and ideas. For Bacon, any role the mind plays in constituting phenomena only distorts reality. Bacon sets himself against those who would spin a fantastical world out of the cells of their own wits; he labors to institute instead a more genuinely receptive natural science. Man can master nature only by obeying it, but the quiescent contemplation of ancient philosophy is not true obedience or faithful receptivity. To be properly receptive, reason must become active, not (as Kant would have it) in constituting its own objects in the acts of perception and thought, but rather in constituting new objects in fact, in the world. The natural philosopher poses his question by vexing nature, but it is nature itself, not man, who

namely, that what can be predicated of one element of a contrary pair cannot unequivocally be predicated of the principle that underlies both contraries.

¹⁵³ Kant, *Critique of Pure Reason*, 20.

answers.¹⁵⁴ Reason's activity can only constrain nature, not supplant or fundamentally alter it; reason can force nature to manifest itself in novel ways, but cannot change what nature itself is. Because it is both impervious to man's meddling and pliant enough to take on different shapes, nature makes possible the reconciliation of reason's activity and reason's receptivity.

Reason's activity, then, is limited to putting questions to nature. Still, reason must ask those questions after some plan of its own. If we begin with an unbiased or aporetic experience of nature, we are fated to end in dogmatism or skepticism. The mind, confounded by nature's subtleties and guided by its own, inveterate anticipations, strives for fantastical, non-physical principles. If we are not to be lost in the waves of experience or, worse, if we are not to be led astray by our own Idol-addled minds, our inquiry must from the beginning be guided by some clue or key. The solution to the mind's error-prone anticipations, however, is a better anticipation, an idea of nature to guide reason's inquiries. That anticipation must be definite enough to suggest a direction, but indefinite enough to give space to the mind's methodically prepared receptivity to nature. Kant's solution fails on both accounts: his perfectly empty thing-in-itself provides no guidance, and reason's activity, in constituting its own objects, makes a genuine receptivity to nature needless.

Bacon's solution takes the form of an anticipation that can guide reason's activity without imperiling the mind's appropriate receptivity. He realizes that he can be a materialist without theoretical knowledge of matter's ultimate principles, that atomism tempered becomes a suitably ambiguous materialism that can serve as the guiding assumption rather than the conclusion of his method. The results are less theoretically satisfying, but more honest and more useful. So Bacon is a materialist, but a *methodological* rather than a *theoretical* materialist.

¹⁵⁴ See *DAS* V.3 (*SEH* IV, 427): "For we can command our questions, though we cannot command the nature of things." See also *HNE* (*OFB* XII, 15): "For we command questions where we cannot command things."

Is methodological materialism really any less dogmatic than theoretical materialism? Bacon sees that inquiry must begin with assumptions or anticipations that the inquiry itself, no matter how far it progresses, will never be able to justify. What saves those anticipations from the charge of dogmatism—and so also from the skeptical attack all dogmatic philosophies are susceptible to—is the distinction Bacon implicitly makes between methodical and non-methodical knowledge. In one sense, knowledge is what method generates. But Bacon's discovery of method depends on another, non-methodical sort of knowledge about the human good and the nature of nature. Bacon's whole program depends on his ability to maintain the independence of these two types of knowledge despite their mutual influence.

While Bacon's anticipations of nature guide method, the knowledge achieved by method does not ultimately depend on the truth of those anticipations. The idea of nature guiding method could be false without compromising the knowledge achieved through method. If, for example, we were to deny Bacon's postulate of a unique, one-to-one correspondence between simple natures and forms or laws, or if we were to reject Bacon's materialist ontology, we could still justifiably maintain the correlation, achieved through eliminative induction, between two manifest natures. That is because the warrant for such knowledge is not a causal chain stretching back to some first cause. The virtue of his method is its ability to establish degrees of certainty without ascending to first principles. In place of first principles, Bacon has anticipations. Those anticipations of nature guide methodical inquiry, but do not serve an evidentiary function. Methodical knowledge is warranted instead by the reliable procedure that produced it, and guaranteed by the production of new works. It would be just as misguided to think that methodical knowledge could somehow falsify or

corroborate those methodological anticipations of nature. Anticipations must find their own, non-methodical support.

So Bacon's methodical knowledge is not dogmatic, at least not in the sense that Democritus's atomism is dogmatic, because methodical knowledge does not rest on first principles that cannot be methodically known. And because methodical knowledge stands on its own, it is safe from the sort of dialectical or skeptical attacks that might be leveled against Democritus's atomism. Democritus succumbed to dogmatism because he had no way to quarantine his speculations or, what comes to the same thing, because he failed to limit his science to what can be experienced. Bacon can more faithfully observe Democritus's rule of heterogeneity by assigning to method the investigation of manifest natures and to some non-methodical wisdom all anticipations of nature's elements and principles.

The incorporation of the Socratic element into Bacon's method requires a similarly radical transformation. Socratic contemplation is the ascent from what is first to us to what is first by nature, or from opinions to an unqualified knowledge of the whole. Bacon's methodical ascent truncates the Socratic ascent. We cannot begin with the speeches and opinions that are really first for us, but must instead begin with what is methodically first, in experience enlarged and directed by method. Since we cannot reach what is first by nature, we must conclude our ascent at a non-arbitrary but non-ultimate point, with those forms that function as methodological primordia. Because it begins later and ends earlier, Bacon's ascent cannot pretend to a knowledge of the whole. There is, on one side, the speeches and opinions cut off by Bacon's new starting point. Method has nothing to say about those speeches and opinions by which men take their bearings and guide their actions. On the other side are the real primordia we can anticipate but cannot methodically know.

Knowledge thus comes to have at least two different meanings, neither of them equivalent to the kind of knowledge to which Socratic contemplation aspired. Method makes possible a more detailed knowledge of intermediate physical causes, but strays beyond its competence if it tries to talk about the good (human or non-human) or nature's principles. Knowledge of first and final causes is extra-methodical. Excluding first and final causes, Bacon's new science is transformed into what Kennington calls *naturalism*:

So Baconian natural philosophy parts company with the natural philosophy of the Greeks: it wholly lacks first beings of any kind. Therefore 'nature' in the sense common to all Greek philosophers, the first things of the whole, ends with Bacon. Stated differently, what begins with Bacon is 'naturalism.' In naturalism, the truth of propositions about natural things is established not by reference to that which is always and everywhere, but by means of method, by a methodical verification, at a particular time and place: naturalism is inevitably historical.¹⁵⁵

Bacon wants to hold together these two ideas, that reliable knowledge is the result of the right procedure and that the knowledge generated by method is nevertheless "a true pattern of the world (*verum exemplar Mundi*)."¹⁵⁵ Method aims at adequation, but adequation is constrained by the method's limits. We can say of what is that it is without saying all there is to say about everything that is. What is beyond method's ken we must handle separately.

3.3.4 The Consolations of Bacon's New Mode of Contemplation

This fracturing and reconstruction of knowledge is the consequence of Bacon's reinterpretation of form. For Aristotle, form is a principle both of being and knowledge, a first and final cause, a principle directly responsible for the appearance of things. Because form or nature is a

¹⁵⁵ Richard Kennington, "Bacon's Reform of Nature," 10.

principle of self-motion, the *telos* of a being, and that which makes each being what it is, the knowledge of forms comprehends what Bacon splits into anticipations of nature, methodical knowledge of nature, and opinions about human things. And because his forms are the cause of being, appearance, and knowledge, Aristotle has no place for a rule of heterogeneity or any need of an artificial method to move from methodical starting points to methodical principles.

Yet much mischief has come of man's presumptuous attempt to scale nature's order to reach God its Creator, and "nothing has corrupted philosophy as much as this inquiry about *Cupid's* parents"—that is, philosophy's insatiable search for what is prior in the order of nature.¹⁵⁶ The mind cannot honestly satisfy its ruinous appetite for what is ultimate, and so it shifts and devises less scrupulous means. Chief among them is an impure admixture of reason and faith, an ambition, on reason's part, to find satisfaction in first and final causes and a debasement, on faith's part, in seeking out reasons for what can be known by revelation alone. Those who, like Aristotle, exhort us to think not of human things, but so far as we can to "make ourselves immortal, and strain every nerve to live in accordance with the best thing in us" are poor counselors. "[W]e should not supply the human intellect with wings," Bacon cautions, "but rather with leaden weights to curb all jumping and flying."¹⁵⁷ Aristotle's flight to a first unmoved mover and Democritus's jump to the atom are equally vain pursuits, "ideas which however true they may be, can do little for the good of mankind."¹⁵⁸

Nor is it clear to Bacon that these philosophers were really moved by a love of wisdom. Plato's and Aristotle's forms may be, as Bacon sometimes charges, motivated by our need for

¹⁵⁶ *DPAO* (*OFB* VI, 199).

¹⁵⁷ *NO I* §104 (*OFB* XI, 163).

¹⁵⁸ *NO I* §66 (*OFB* XI, 107).

reassurance that nature is good and beneficent. Atomism, though it draws the conclusion that nature and the gods are indifferent to our good, would seem open to a similar criticism. Lucretius's atomism, at any rate, seems calculated to put us at ease rather than supply a true account of nature's workings.¹⁵⁹ Bacon's program for mastering nature is better aligned, to be sure, with a theory that denies any teleological ordering in nature, and atomism comes closer than any other theory to Bacon's own ontology. But without a reliable way to move between principles and experiences, Democritean atomism is neither epistemologically satisfying nor practically useful. It offers neither knowledge nor power. Like Socratic philosophy, it twists man's contemplative resignation into his most noble virtue.

Curbing the search for what is by nature first and highest amounts to a rejection of the old way of contemplation. Though we must give up reason's theoretical ambitions and the nobility of a life given over to their pursuit, we are not without consolations. Kant, for one, realized that practical reason could occupy the space ceded by theoretical reason, and Bacon's humbling of contemplative reason stakes mankind to immense productive power. No longer should our labor be "swallowed up in investigating and treating of the principles of things and furthest reaches," as Aristotle taught us to do, but more profitably invested in the discovery of those "intermediate causes" where "all utility and capacity for producing works lies," those "true, solid, and living axioms on which men's fortune and affairs depend."¹⁶⁰ And the existence of scientific laborers and scholarly types proves that the human desire for knowledge can, in some measure, be satisfied without ascending to first principles.

¹⁵⁹ Bacon accuses Epicurus of "accommodating and subjecting his natural to his moral philosophy" by rejecting "any opinion that depressed or hurt the mind, and troubled that *Euthymia* of his, which he had adopted from Democritus." Epicurus was, Bacon reproves, "more fond of enjoying the sweets of thought than patient of the truth." See *DAS* II.13 (*SEH* IV, 321). On this charge, at least, Democritus seems to escape Bacon's censure.

¹⁶⁰ *NO* I §§66 and 104 (*OFB* XI, 107 and 161).

But to put the problem in terms of trade-offs—that the sacrifice of philosophical wisdom is the price of greater freedom and power—does not do justice to Bacon. He offers his critique in good faith, I think; he is charting the true limits of human knowing so far as he can discern them. And we must be careful not to reduce Bacon to his method. The discoverer of method, the man who saw that it would be in the interest in the living and those yet to come to direct their industry toward a new goal, must possess a wisdom that surpasses the knowledge method makes possible. His methodical disciplining of reason does not rule out the possibility that Bacon himself strives for a genuine if patchwork contemplative science.

Chapter 4

Bacon's New Science, the Human Good, and the Apotheosis of Man

I turn now from nature generally to human nature, from nature mastered to nature's master. In the previous chapters, I took up Bacon's critique of the old philosophers' starting points and order of demonstration. Setting out from the wrong starting points (chapter two), the old science sought, by means of a headlong ascent, a knowledge of what does not exist or what, at any rate, is not available to human reason (chapter 3). In correcting these two errors, Bacon's new science redraws the relation between theory and practice, forcing ancient theory to conform to practice's demands. "But the greatest Error of all the rest," Bacon said, concluding a different catalog of errors, "is the mistaking or misplacing of the last or furthest end of knowledge."¹ More fundamental than those critiques of what the ancients sought to know, or how they sought to know it, is Bacon's critique of the good or goods to be had in or through knowing. His critique of the end of knowledge is the subject of this chapter.

4.0.1 Ambiguity about the True End or Ends of Knowledge

Misplacing or mistaking the furthest end of knowledge is the greatest error of all, Bacon says. What, then, is that last or furthest end of knowledge? Piecing together Bacon's best-known statements and the most authoritative interpretations suggests something like this: knowledge governed by charity aims, by means of a new artful science or a scientific art, to master nature for

¹ *AL I (OFB IV, 31)*.

the relief of man's estate. To see just what this formula means, and to judge whether it truly expresses Bacon's goal, it will help to begin with a few of Bacon's own statements.

In *Distributio operis*, just after announcing that his new logic differs from the old logic in its end, order of demonstration, and starting points, Bacon identifies not one but four ends. His new science will discover "arts" (not "arguments"), "principles" (not "what agrees with principles"), and "pointers to works in embryo" (not "probable reasons"); his new science aims "to bend nature to works" (not "beat an opponent in debate").² The list raises more questions than it answers. Is knowledge of principles sought for its own sake, or only for the works such knowledge makes possible? Those newly discovered arts are the means by which we bend nature to works, but to what works should nature be bent, and to what end? These ambiguities show up again in the speech Bacon gives, in *New Atlantis*, to the Father of Salomon's House: "The End of our Foundation is the knowledge of Causes, and secret motions of things; and the enlarging of the bounds of Human Empire, to the effecting of all things possible."³ Here a contemplative goal (described twice) stands alongside a practical goal (also described twice) without any hint that one can or should be subordinated to the other. The practical goal seeks an unconstrained expansion of power without any hint about how that greater power should be put to use. Some uses of that immense power are not obviously good, we later learn. Because not all of their discoveries and inventions are fit to be made public, the fellows of Salomon's House, or some number of them, decide what part of their work to reveal and what part to keep secret. But the Father's speech offers no clue about what special wisdom guides those consultations or how they came to have it.

² *DO* (OFB XI, 29).

³ *NA* (*SEH* III, 156). Bacon is even more explicit in an unpublished fragment, *Valerius Terminus* (*SEH* III, 222): "To speak plainly and clearly, it is a discovery of all operations and possibilities of operations from immortality (if it be possible) to the meanest mechanical practice."

Though they both aim to convey what is essential about the new science, neither the plan to Bacon's Instauration nor the Father's speech clearly communicate the project's last or farthest end. The critique itself, as we will see, also frustrates our hopes for an unambiguous resolution. Only at the end of *Novum organum* I does Bacon brave "a few words about the excellence of the goal we aim at." It "seems" to Bacon—and the judgment of ancient times agrees, he says—that a "healthier (*sanior*)" and "more august (*augustior*)" human ambition "strives to renew and increase the empire of humanity itself over the whole universe of things" through the advancement of the arts and sciences and the "introduction of noble discoveries."⁴ Unlike the improvement of political condition, which "seldom proceeds without violence and disorder," new discoveries and inventions "enrich and spread their blessings without causing hurt or grief to anybody."⁵ Bacon offers as examples the discovery of the printing press, gunpowder, and the mariner's compass. So completely have these inventions "altered the whole face and state of things" that, Bacon claims, "no empire, no sect and no star" has had a greater influence on human affairs. And yet Bacon is conspicuously silent about the *goodness* of these powerful and consequential inventions. Yet surely it matters whether the printing press be used to incite faction and spread heresy or unite a people and teach the true faith. Surely it matters whether gunpowder be used by a just city in its just defense or by a tyrant to strengthen his cruel and despotic rule. And surely it matters whether the mariner's compass be put in the service of mutually beneficial trade or made to serve the exploitation and enslavement of a foreign people. All "worldly goods," he grants, can be "corruptly given over to vice, extravagance and the like." There are, in this life, no final or unalloyed goods. "Right reason and true religion,"

⁴ NO I §129 (OFB XI, 193-95). Bacon twice ranks human activities and ambitions. In the first ranking, the introduction of discoveries "seems" to "rank highest among human activities by a long way."

⁵ NO I §129 (OFB XI, 193).

therefore, must govern the arts and direct their discoveries to the true good.⁶ Bacon's new science appears, then, to be good insofar as it is *useful*. If we want to know what goods this new tool should serve, we must appeal to other authorities. Yet since reason's rightness and religion's truth are intimately bound up with their ability to discern ends right and true, Bacon's silence about those last and furthest goals is all the more unsettling.

Bacon further confuses that already ambiguous teaching by suggesting, in the same aphorism, that perhaps knowledge is not only a useful good, that it has its own, intrinsic ends. "To tell the whole truth," Bacon interposes,

just as we love light because by it we can travel, practice our arts, read, and recognize each other, and yet actually seeing the light is still more excellent and beautiful than all its various uses, so surely is the very contemplation of things as they are without superstition or imposture, error or confusion, intrinsically more worthy than all the fruits of discoveries.⁷

Knowledge is what Socrates would have called a mixed good: it is both useful—good because we achieve other goods through it—and a good in itself, the sort of thing we desire for its own sake.⁸

Bacon's enthymematic argument for ranking the intrinsic good of knowledge above its utility mimics Aristotle's own but colors it with Christian allusions. All men by nature desire to know, Aristotle said. A sign of this desire is that, apart from their usefulness, we love and take delight in our senses, especially the sense of sight.⁹ In Bacon's recapitulation, though, it is not our senses that we love but the light itself, and light is a common Christian figure for Christ.

But the good achieved by "the very contemplation of things" is neither Aristotelian nor Christian. The good of contemplation, as Bacon here describes it, is freedom from superstition, imposture, confusion and error. "It might be said," Bacon said himself, just a few aphorisms earlier,

⁶ NO I §129 (OFB XI, 197).

⁷ NO I §129 (OFB XI, 197).

⁸ Plato, *Republic* 357b-c.

⁹ *Metaphysics* A, 980a. See also Plato, *Republic* 475d-e.

“that contemplation of truth is worthier and nobler than all utility and magnitude of works.”¹⁰ Here, in §124, the good of contemplation is “peace and tranquility,” a state Bacon describes parenthetically as “a state more divine.” Bacon does not say that his contemplative goods are different from the Socratics’, but instead invites us to compare the two ways of contemplation in terms of their success. In place of the ancients’ “abstractions made arbitrarily” and their “botched and (if you like) apish patterns of the world,” Bacon will “lay foundations in the human intellect for a true pattern of the world as we actually find it” and discover “the *Ideas* of the divine,” the “authentic seals that the Creator has stamped upon his creatures according as they are impressed and defined in matter by true and exact lines.”¹¹ The Christian correction of contemplation is not here, as it appears to be elsewhere, its subordination to charity. Contrary to those ancients who grounded the nobility of the contemplative life on the nobility of the beings it contemplates, Bacon sometimes says that no existing thing is too base a subject for contemplation.¹² Any being God created is worth knowing. And yet the one subject off limits to Baconian science is God Himself. The contemplative goal is not, after all, a Christian anticipation, in this life, of heavenly beatitude. The life of contemplation is highest without bringing us into communion with what is highest. Contemplation instead achieves a subjective good: in contemplation we experience peace, tranquility, and freedom from perturbation.

These few passages exhibit well enough the convolutions of Bacon’s thinking about and rhetorical approach to the question of the proper end of knowledge. Practical goods are set against contemplative goods without much clarity about what those practical or contemplative goods are, how far they can be reconciled, or how to choose between them if and when reconciliation proves impossible. Ancient philosophy is set against Christian faith, though the result looks neither

¹⁰ NO I §124 (OFB XI, 187).

¹¹ NO I §124 (OFB XI, 187).

¹² See, for example, NO I §120 (OFB XI, 179-181).

especially Socratic nor especially Christian. It is no great wonder, then, that Bacon has been read so variously.

These puzzles are only apparently solved by Bacon's suggestion, in the *Advancement of Learning*, that "contemplation and action may be more neerely and straightly conioyned and vnited together, than they haue beene."¹³ That conjunction—what he calls, in four different works, the second way of contemplation—at the same time promises a reconciliation of—and so, too, an improvement on—philosophical contemplation and Christian charity.¹⁴ Alms-giving, while commendable, cannot improve man's lot as much as the advancement of the arts and sciences. Contemplation in service of practical ends outpaces leisurely speculation. Yet this second way of contemplation achieves, at best, an uneasy truce. In the *Advancement*, for example, Bacon is silent about those subjective goods of contemplation he ranked, in *Novum organum*, above all utility. Knowledge ought not be sought out of "naturall curiositie" or an "inquisitiue appetite," as if men "sought in knowledge a Cowch, wherupon to rest a searching and restlesse spirite," nor ought knowledge be sought "to enteraine [men's] mindes with varietie and delight," as if men sought in knowledge "a tarrasse for a wandering and variable minde, to walke vp and downe with a faire prospect." No, "to giue a true account of their guift of reason," knowledge ought to be sought for "the benefite and vse of men," the "glorie of the Creator, and the reliefe of Mans estate."¹⁵ Again, Bacon's answer invites more questions. Does the relief of man's estate exhaust the ways in which knowledge glorifies the Creator? Can knowledge of creation that must stop short of its Creator really glorify Him? Supposing it can, does the knowledge that glorifies God also bring the peace, tranquility, and freedom from perturbation that Bacon said, in *Novum organum*, were the fruit of

¹³ *AL* I (*OFB* IV, 32).

¹⁴ Bacon explicitly discusses two ways of contemplation at *AL* I (*OFB* IV, 31), *VT* ch. 20 (*SEH* III, 250), *NO* Preface (*OFB* XI, 57-59), and *IM* Proem (*OFB* XI, 5).

¹⁵ *AL* I (*OFB* IV, 31-32).

contemplation? Is all the knowledge a man can bend to his own use and benefit a fit oblation to his Lord?

The problem, in part, is the different rhetorical demands Bacon must meet. The *Advancement of Learning* offers an apology for knowledge addressed primarily to Christians and men much invested in the old philosophy. Fittingly, then, does it take a more conservative stance toward the received learning, softening its criticisms and playing down its innovations. And fittingly does it perform, outwardly, at least, the necessary devotions. The *Novum organum*, by contrast, is directed to those sons of science who will carry forward Bacon's ambitious project. Where the *Advancement* had called for the continued advancement and proficiency of learning, the *Novum organum* demands that philosophy make a clean break, a totally new beginning. The tone is more daring and defiant, a call to action for those who want at last to "throw open the doors to [Nature's] inner sanctum."¹⁶ Accordingly, the defense of learning in the *Advancement* begins and ends with the charge that the desire for knowledge led to man's Fall and his estrangement from God. The *Novum organum*, on the other hand, offers a critique of ancient and especially Socratic philosophy. In the *Advancement*, Bacon says that the search for knowledge can be purified of all vanity and pride if it is governed by charity. The *Novum organum*, by contrast, has very little to say about charity.¹⁷ Since neither sin nor disobedience but the mind's desire for what is more ultimate and man's impatient desire to harvest the unripe fruit of his discoveries are the real temptations, method—not charity—is the more needful curb and corrective.

The problem, though, is not wholly rhetorical. The philosophical life and the monastical life are each dedicated to a kind of contemplation that is not easy to reconcile with the more workaday

¹⁶ *NO* Preface (*OFB* XI, 59).

¹⁷ As far as I can tell, Bacon does not use the word *charitas* in the *Novum organum* proper, though it does occur three times in *MI* Preface, first in a prayer and then twice in the subsequent paragraph in which Bacon admonishes us "to think on the true ends of knowledge." See *IM* Preface (*OFB* XI, 23).

life given over to practical and productive action. Saying that contemplation and action should be more nearly conjoined, that we should somehow couple “the two highest Planets, *Saturne* the Planet of rest and contemplation” and “*Iupiter* the Planet of ciuile societie and action,” does not make it so.¹⁸ Nevertheless, Bacon’s desire for the reconciliation seems genuine. Bacon’s readers, however, have usually wanted to draw him to one side or the other. Richard Kennington helpfully identifies two poles toward which interpretations of Bacon tend.¹⁹ Those who tend toward the first see Bacon as one of the first, great modern repudiators of classical philosophy’s contemplative goal. Science becomes technology and the desire to know becomes the narrow pursuit of utility. The second sort take Bacon to be a contemplative philosopher in his goals if not in his means. For them, science is the pure knowledge of causes and technology the application of pure science. Neither side can prove its case because Bacon’s statements support both readings, as we have just seen. Those who want to make Bacon a genuine, contemplative philosopher must explain away his interest in power and mastery as the public-facing means by which the philosophical few protect themselves from the non-philosophical many. Those who want to reduce his mastery project to utilitarian public works must somehow account for his obvious theoretical ambitions and his willingness to put off practical goods to an indefinite future. The evidence is ambiguous because Bacon aims to overcome the dichotomy between theory and practice or to make contemplation more active. The desire to draw Bacon to one extreme or the other points to the real difficulty in Bacon’s attempted reconciliation.

The difficulty is in reconciling what look like heterogeneous practical and theoretical goods. Since Socrates, at least, the reconciliation between theory and practice has been a pressing human problem. Socrates framed that problem for the subsequent philosophical tradition. Knowledge

¹⁸ *AL I* (*OFB IV*, 32).

¹⁹ See “Bacon’s Critique of Ancient Philosophy in *New Organon I*,” 18-19. Cf. Kennington, “Bacon’s Reform of Nature,” 1-3.

proper is of the static ideal, but human action takes place in a world of ever-changing matter. It becomes difficult to explain how ideal knowledge can be achieved by composite beings such as we are with experience of a composite world such as ours. It also becomes difficult to explain how rational principle can guide human action or to justify the concessions the good must make in a world ruled by harsh necessity. Socrates's framing of the problem suggests what we might think of as typical philosophical remedies. The tension in human affairs and between theory and practice is overcome, as far as it can be, by striving for a kind of divinity, a solution that is perhaps clearest in Aristotle's exhortation to become godlike. Christianity similarly exhorts man to an imitation of God and promises a perfect and final reconciliation in heaven. Both solve the problems we face as human beings in this life by transcending the merely-human here and now.

4.0.2 Apotheosis as the True End of Knowledge

If we are going to understand Bacon's own attempt to close the gap between what is and what is good, we have to see his program in light of these Socratic and Christian solutions. Bacon, too, wants us to become like gods, but more human gods capable of realizing the good here and now. That is what mastery and his new way of contemplation promise. Neither contemplation nor action alone can achieve man's good, and there exists no model for the necessary synthesis. We seek in vain for a solution in Christian thought or Socratic philosophy or some alloy of the two. Instead, Bacon seeks to set one against the other in order to open up a genuinely new possibility. His new way of contemplation is a non-Christian, non-Socratic unification of contemplation and action adequate to our actual human situation, an apotheosis that, without making him any less human, makes man a god to man and a kind of first cause of recreated nature.

That, at any rate, is how I think we can best make sense of Bacon's many seemingly contradictory arguments about the human good. Read carefully, *Novum organum* I §129 strongly suggests this conclusion. Between his praise of noble discoveries and "the very contemplation of things," Bacon says that discoveries are "like new Creations" and "imitations of God's handiwork." It is "worth noting," he adds, in the next paragraph, that Solomon chose wisdom over all other goods, but it is the pagan Lucretius that Bacon summons to testify to man's godlike creative ability.²⁰ He invites us to consider "the difference between the life of men in any of the most civilised province of Europe and in one of the most savage and barbarous regions of the New Indies," differences "great enough to justify the remark that *Man is a God to man*," a difference that "does not spring from soil, climate, or bodily constitution but from the arts." Such godlike power enables man to satisfy his material needs; peace and tranquility are the immaterial fruit of a godlike contemplation.²¹ We become godlike not through the contemplation of God or by the sustained activity of what is most divine in us, but by gaining a godlike view of and power over the passions and vicissitudes suffered by man. This apotheosis of man is the real human good and so also the last and farthest goal of Bacon's new science.

4.0.3 Overview of the Chapter

Our cursory review of Bacon's statements about the human good and the proper end of knowledge demonstrates that we cannot place much interpretive weight on any one text. To explain myself and make my case, I will offer, in what follows, interpretations of two key texts: Bacon's

²⁰ NO I §129 (OFB XI, 193). Bacon quotes Lucretius, *De rerum natura* VI.1-3, emphasizing the word *RECREAVERUNT*. According to Lucretius, it is the Athenians, not the gods, who "RECREATED life" by spreading agricultural knowledge and, secondarily, by laying down laws.

²¹ NO I §§124 and 129 (OFB XI 187 and 195-97).

meditation on the Prometheus myth in *De sapientia veterum* (4.1) and his defense of learning in the *Advancement of Learning* (4.2).

I could have chosen other texts, the *Essays*, for example, or *New Atlantis*. A fully satisfactory interpretation would have to take them all into consideration and account for apparent inconsistencies. My choice of texts, however, is not arbitrary. “Prometheus, or the State of Man,” I will argue, presents Bacon’s foundational teaching about human nature and the human condition. That same view of human nature and the human condition grounds Bacon’s apology for learning in the *Advancement*. Both texts confront man’s peculiar neediness and what hope he has of remedying it.

The two also invite comparison. Bacon proposes to speak, in *De sapientia veterum*, of human wisdom only. Because he does not keep to his self-imposed limitation, “Prometheus” itself raises the problem of how we should understand the pagan-poetical story of man’s creation in light of the biblical creation story. The problem becomes more pointed when we place, as we ought, “Prometheus” alongside Bacon’s Christian-seeming defense of learning in the *Advancement*. A concern with creation stories is not all that connects the two texts. A careful reading of “Prometheus” will draw us into a consideration of a handful of related myths, especially “The Sirens, or Pleasure” and “Orpheus, or Philosophy.” Together, these myths offer a critique of Socratic philosophy worth comparing to Bacon’s characterization of the Socratic turn in the *Advancement*. *De sapientia veterum* and *Advancement* thus offer complementary accounts of the human things developed dialectically against the biblical and Socratic traditions.

Along the way, we shall have to grapple with the problem of how Bacon’s teaching about the human things is related to his teaching about nature. Bacon’s critiques of the ancient starting point and order of demonstration call into question the possibility of the sort of wisdom about human things that could ground a critique of the end of knowledge. In the second and third chapters, I

pointed out those features of Bacon's new science that would seem to limit what we can know, by means of the method, about the human good. In rejecting the ancient starting point in opinion and ordinary experience, in denying the ultimacy of natural kinds, Bacon's science would seem to forsake knowledge of what is specifically human and turn its back on knowledge of the workaday world of human concerns. And if what Bacon says about being is true, those limits are not only methodical. If man, like all other beings, really is nothing more than a relatively stable conjunction of simple natures, if there is no essential nature specific to man as man, it becomes very hard to talk about the *human* good. Bacon's new teaching about nature and his injunction against natural theology would seem also to leave man without any natural or divine standard by which he could rationally judge his own choices. For this reason and others, Richard Kennington concluded that "Bacon's critique of the ancients is limited to the order of demonstration and the start point: it does not offer a critique of the end, for example, of the ancient view of the good" and "excludes a critique directed at the practical philosophy of the ancients."²² These difficulties make it all the more necessary to focus our exegesis on non-methodological texts like the *Advancement* and *De sapientia veterum* without forgetting our need to relate, eventually, those non- or pre-methodological arguments to the picture that emerges from the methodological study of man.

4.1 The Virtue of Ingratitude: Bacon's "Prometheus, or The State of Man"

I will look first at Bacon's interpretation of the Prometheus fable in *De sapientia veterum*. Here we find, as the subtitle suggests, one of Bacon's more important accounts of humankind and the human condition, an account of man's creation and his strained relations with the gods that should

²² "Bacon's Critique of Ancient Philosophy in *New Organon* I," 20.

be compared to its Christian counterpart in the story, in the first chapters of *Genesis*, of man's creation and Fall. Because *De sapientia veterum* is an strange text, I begin by discussing my interpretative approach (4.1.1). Turning to the "Prometheus" text itself, I divide Bacon's interpretation into three parts, considering first what it reveals about man's constitution (4.1.2), next what it reveals about man's relation to the gods (4.1.3), and finally what it reveals about human greatness and the role of pleasure in human life (4.1.4). The result is a picture of man, rooted in his nature, that places his happiness in striving for a godlike self-sufficiency.

4.1.1 How to Interpret Bacon's Interpretations in *De sapientia veterum*

De sapientia veterum is a curious work. Published in 1609, it contains Bacon's recounting and interpretation of thirty-one ancient fables. He says, in the first letter of dedication, that his purpose "has been, passing by things obvious and obsolete and commonplace, to give some help towards the difficulties of life and the secrets of science."²³ Just what the secrets of science have to do with the difficulties of life he does not say. Nor does he say why that knowledge is secret. Whatever the reason, some ancient wisdom has been laid up in these thirty-one fables, and Bacon proposes to recover it.

That wisdom is pointedly not the wisdom of Christian revelation. The preface's first sentence distinguishes the wisdom to be found in these fables from what has been preserved in the scriptures.²⁴ Bacon likens the fables to the "veils and shadows" of religious parables, but here, in this work, he will speak of human wisdom only.²⁵ The wisdom laid up in these fables is not the most

²³ *DSV* Epistle Dedicatory (*SEH* VI, 689-90/619).

²⁴ *DSV* Preface (*SEH* VI, 695/625).

²⁵ *DSV* Preface (*SEH* VI, 696/625). Cf. *DSV* Epistle Dedicatory (*SEH* VI, 689/619).

ancient, nor is its source divine. So it is not simply the antiquity of the fables that recommends them nor any just claim to divine authority that warrants their wisdom. While the title and conceit of the work suggest otherwise, Bacon's argument in the preface undercuts the very idea that men in the "primitive ages" could have discovered any wisdom worthy of the name.²⁶ In the old times, he says, "the world was full of all kinds of fables, and enigmas, and parables, and similitudes" because "the understanding of men" was "rude and impatient of all subtleties that did not address themselves to the sense."²⁷ Men turned to parables because they were incapable of arguments and abstractions.

Having ruled out both revelation and reason as the source of the fables' wisdom, Bacon offers his reader two ways to take his interpretative efforts. Whether their authors were great or lucky, whether they "invented the figure to shadow the meaning" or happened unawares on "matter which gives occasion to such worthy contemplations," the fables still justify the pains he has taken in interpreting them since, Bacon argues, "I shall be throwing light either upon antiquity or upon nature itself."²⁸ So the true teaching is true whether it is of ancient provenance or is Bacon's own. The choice, however, is a false one. In such a disjunction, nature, not antiquity, must be the true standard, and the interpreter of the fables must be at least as wise as their authors. Bacon had already said as much. "It may be that my reverence for the primitive time carries me too far," Bacon pretends to confess, "but the truth is that in some of these fables . . . I find a conformity and connexion with the thing signified, so close and so evident, that one cannot help believing such a signification to have been designed and meditated from the first and purposely shadowed out."²⁹

That is, we need not trust antiquity's own claim to possess wisdom and be worthy of reverence. We

²⁶ Timothy Paterson wonders whether the work's title might not be "an example of Baconian wordplay. On the surface, 'wisdom of the ancients' refers to the wisdom of men who lived long ago; beneath the surface, it refers to the wisdom of the 'true' ancients; that is, the moderns!" See Paterson's "Bacon's Myth of Orpheus: Power as a Goal of Science in *Of the Wisdom of the Ancients*," *Interpretation* 16, no. 3 (1989): 433.

²⁷ *DSV* Preface (*SEH* VI, 698/628).

²⁸ *DSV* Preface (*SEH* VI, 699/628).

²⁹ *DSV* Preface (*SEH* VI, 696/626).

can judge what they said in light of what we can see for ourselves. It is we who rightly judge the truth of the ancient teachings. In fact, we can recognize the fables' secret meanings only because they conform to our independent knowledge of nature.

Bacon is our real teacher, and his subject is nature itself. But why then does he couch his teachings in the interpretation of fables? Parables have two, contrary uses, Bacon says: "they serve to disguise and veil the meaning, and they serve also to clear and throw light upon it."³⁰ Bacon has need of both uses. Bacon knows "very well what pliant stuff fable is made of, how freely it will follow any way you please to draw it, and how easily with a little dexterity and discourse of wit meanings which it was never meant to bear may be plausibly put upon it," and though he accuses Chrysippus and the alchemists of trading on the antiquity of fables to win credit for their own teachings, he never quite denies using those same means for other ends.³¹ Bacon does not count on the authority of antiquity, but in putting forward his own teachings as interpretations of old stories, he can be more forthright than would otherwise be prudent. He can throw light on some truth while disguising and veiling its author or discoverer. He also turns the middling antiquity of the fables to another use. Arising from a time more recent than and independent of what is recounted in the Old Testament, the teaching Bacon discovers in the fables need not openly reckon with the biblical teaching. And because the teaching is older than the Greek poets, it is free of the taint of the Greek philosophers.³² His defections from biblical and received philosophical wisdom thereby move off stage. Having distanced himself and sidestepped crippling scandals, Bacon can use these old myths in the way he says they were used before they were old: "as a method of teaching, whereby inventions that are new and abstruse and remote from vulgar opinion may find easier passage to the understanding."

³⁰ *DSV* Preface (*SEH* VI, 698/628).

³¹ *DSV* Preface (*SEH* VI, 695/625). Cf. *CV* (F, 86-87) and *NO* I §122 (*OFB* XI, 183-85) and see Paterson, "Bacon's Myth of Orpheus: Power as a Goal of Science in *Of the Wisdom of the Ancients*," 429-30.

³² *DSV* Preface (*SEH* VI, 697-98/627). Bacon also contrasts his own interpretations with Chrysippus's "Stoical" interpretations.

Similitudes may be necessary if one wishes “to let new light on any subject into men’s minds, and that without offence or harshness.”³³

There are limits, however, to what Bacon can make plain. “To the vulgar apprehension” his interpretations, like the fables they explain, “will be vulgar,” yet “it may be that the deeper intellect will not be left aground by them, but rather (as I hope) carried along.”³⁴ We ought, then, to look for the deeper wisdom Bacon has laid up in what he has allowed to look vulgar. We ought, in fact, to read Bacon’s interpretations as he proposes to read the myths. In the preface, he gives us examples of how the same things are received according to a vulgar and a more discerning capacity. “For who is there so impenetrable and that can so shut his eyes to a plain thing,” he asks, but that when he hears how Fame sprang up after the Giants’ rebellion was put down “will at once see” that the story is a figure representing the rumors that always spread after a rebellion is suppressed?³⁵ Such easy and vulgar readings need not be troubled by “a bit of real history” interspersed “or some things added only for ornament, or times confounded, or part of one fable transferred to another and a new allegory introduced.”³⁶ Such easy and vulgar readings take it as a matter of course that such inconsistencies inevitably “occur in stories invented (as these were) by men who both lived in different ages and had different ends, some being more modern, some more ancient, some having in their thoughts natural philosophy, others civil affairs.”³⁷ Deeper intellects, however, will not so quickly dismiss these awkwardnesses. Indeed, “there is yet another sign, and one of no small value, that these fables”—and so, too, their interpretations—“contain a hidden and involved meaning;

³³ *DSV* Preface (*SEH* VI, 698/628). Cf. *AL* II (*OFB* IV, 125). Howard White intriguingly suggests a connection between *DSV* and *New Atlantis*. In *DSV*, Bacon uses old myths to convey a new and abstruse truth. *New Atlantis* aims to do the same in a fable of Bacon’s own making. See *Peace Among the Willows*, 190-91.

³⁴ *DSV* Dedication (*SEH* VI, 690/619-20). Paterson offers a helpful discussion of the literary character of *DSV* in his “Bacon’s Myth of Orpheus: Power as a Goal of Science in *Of the Wisdom of the Ancients*,” 427-33. He offers both external and internal evidence to argue, against Paolo Rossi and others, that the work has an esoteric meaning.

³⁵ *DSV* Preface (*SEH* VI, 696/626).

³⁶ *DSV* Preface (*SEH* VI, 697/626-27).

³⁷ *DSV* Preface (*SEH* VI, 697/626-27).

which is, that some of them are so absurd and stupid upon the face of the narrative taken by itself, that they may be said to give notice from afar and cry out that there is a parable below.”³⁸ Attention to historical interspersions, times confounded, thing merely ornamental, the intermixing of fables, and other oddities will help us discern the hidden and involved meanings and distinguish the different ages, different ends, and different subjects that the vulgar reader leaves unanalyzed. Deeper intellects will also attend to what Bacon leaves unsaid, especially what the work’s conceit is structured to leave unsaid. I mean principally those points where Bacon’s teaching diverges from the ancient philosophical and biblical traditions. Moving those disputes off stage allows a vulgar apprehension to receive Bacon’s teachings untroubled by Bacon’s heterodoxy while enticing a deeper intellect to search out Bacon’s secrets.

Beyond that note of caution and those few hints, though, there is precious little to guide our reading of this mysterious work. Why, for example, does Bacon choose these thirty-one myths and not others? How faithful to their originals are his retellings? Is there any significance to their order?³⁹ Why is the longest interpretation some nine times longer than the shortest? What are we to make of the fact that some deal with political affairs, others with non-political human things, some concern nature and natural philosophy, and others touch on religious matters? What should we make of the same figures appearing in different fables? What, besides a common conceit, holds these thirty-one interpretations together as a integral whole? Frankly, I do not know. Such question could only be answered by a comprehensive interpretation of the whole work, and that is not what I here propose. Still, these more general issues are worth keeping in mind as we turn to our more limited goal, an

³⁸ *DSV* Preface (*SEH* VI, 697/626-27).

³⁹ See Heidi Studer, “‘Strange Fire at the Altar of the Lord’: Francis Bacon on Human Nature,” *The Review of Politics* 65, no. 2 (Spring, 2003): 211, n. 3. Studer divides *DSV* into four thematic parts: political problems, philosophy and its limits, the real ends of man’s conquest of nature, and, last, “questions arising from the use of science and philosophy.”

interpretation of “Prometheus, or the State of Man.” If nothing else, they express some of the limits of so piecemeal an effort.

4.1.2 *The Creation and Constitution of Man*

So prepared, let us now turn to the text itself. Bacon titles his interpretation “Prometheus, or the State of Man.” “Prometheus” is the twenty-sixth of the thirty-one interpretations in *De sapientia veterum*, and by far the longest. As he typically does, Bacon begins by recounting the fable—marked here with the formulary “Tradition says”—and then offers an interpretation of it. His interpretation touches on man’s origin and character (or his *nature*, what is most characteristic about man), explains the cause of his sufferings, and suggests how he might find satisfaction. Bacon finds in the fable “many true and grave speculations both on the surface and underneath,” some things known long ago and “others that have never been touched at all.”⁴⁰ Bacon, however, never flags what in his interpretation is truly new. We must seek for ourselves Bacon’s innovations.

Bacon chooses a pagan myth to convey his teaching about the state of man. In the context of the work, his choice does not seem so strange, but we ought not forget what it takes the place of. For Christians, the biblical account of creation grounds man’s self-understanding. Man is the culmination of God’s creation, the being God made in His image and likeness, to whom God gives dominion over all the earth and commands to be fruitful, to multiply, to replenish and subdue the earth. Man is dust made into a living soul when God breathed into his nostrils the breath of life. He is put in an abundant garden to dress and keep it. Because it is not good for man to be alone, God creates every beast of the field and every fowl of the air and, finally, Eve, bone of his bone and flesh

⁴⁰ *DSV* “Prometheus” (*SEH* VI, 746/670).

of his flesh. Made one flesh again through marriage, man and woman are made to walk with God and keep His one command. That man has been cast out of the garden, that he must eat his bread in the sweat of his face, that he will return in death to the dust from which he was created, and that he no longer walks with God is his own, most grievous fault. For Eve saw that the one tree forbidden her was good for food, pleasant to the eyes, and desirable to make one wise, and she and Adam did eat of it and become as gods, knowing good and evil. Forsaking God's commandment and his benevolent care, they see for the first time their own nakedness and neediness. They are ashamed, try to cover themselves, and hide from God. The creation story explains why human life is as it is: hard, short, and full of indignities. God made man for happiness and provided for all his true needs. Man's miseries are all his own doing, the result of his defection from a perfectly good, perfectly knowing, and perfectly powerful God. Finally, it suggests indirectly that man's real good and his salvation, so far as it is within his own power, depends on renouncing his proud independence and the knowledge that made it possible in order to submit himself again to God's good rule. Bacon uses the Prometheus myth to tell a very different story about man's origins, his situation, and his salvation. To really hear that story, we must keep in mind the bible's competing account.⁴¹

The figure of Prometheus "clearly and expressly signifies Providence," Bacon says.⁴² Really, though, nothing about the significance is clear or express. *Providence*, on Bacon's telling, sometimes means the agent whose "special and peculiar work" was "the creation and constitution of Man."⁴³

⁴¹ Heidi Studer argues that only one, short section of "Prometheus" deals directly with matters of religion. Still, "Every part of this fable (except perhaps putting the gift on an ass and the reconciliation of Prometheus and man) seems to have an obvious connection to theological issues," she concedes, "but Bacon does not so describe them." From his silence, Studer concludes that, for Bacon, "religion is not therefore a chief feature of the estate of man, the condition of man, matters of arts and intellectual things, the morals of man, etc. Indeed, the divine seems to surface as one of the effects of man, not as a cause of man." See "'Strange Fire at the Altar of the Lord': Francis Bacon on Human Nature," 227-28. If she is right, Bacon's interpretation of the Prometheus myth is shot through with theological import made all the more significant by Bacon's decision to not address those theological issues openly.

⁴² *DSV* "Prometheus" (*SEH* VI, 746/670).

⁴³ *DSV* "Prometheus" (*SEH* VI, 746-47/670).

Despite the pagan mythological context, Bacon's contemporaries could not help but hear in Bacon's invocation of this "greater providence" an allusion to Christian teachings, an echo Bacon encourages by asserting, in the concluding paragraph, "a wonderful correspondence" between the Prometheus myth and "the mysteries of the Christian faith."⁴⁴ But Prometheus also and more typically signifies human providence, the self-concerned forethought by which man arranges his affairs and seeks his own good. Toward the end of the interpretation, Bacon even explicitly identifies Prometheus with "Human Nature."⁴⁵ Bacon's interpretation purposely confounds these two meanings. To get at his real teaching, we will have to tease them apart.⁴⁶

Consider first the questionable argument linking human and divine providence. Man has mind and intellect, and so also providence, Bacon argues, because he is the creation of Providence. Or at least it would be "harsh and incredible" to "derive mind and reason from principles brutal and irrational."⁴⁷ Incredible, however, is not the same as impossible, and so "it follows almost necessarily"—that is, *not* necessarily—"that the human spirit was endued with providence not without the precedent and intention and warrant of the greater providence."⁴⁸ The strength of the inference rests, it seems, on the harshness and incredibility of the alternative. But by the paragraph's end, Bacon gives us reason to believe the unbelievable. It is "most true" and again "a sober and solid truth" that "of all things in the universe man is the most composite," and "this is indeed the reason it [the body of man] is capable of such wonderful powers and faculties."⁴⁹ Man's "abundance and

⁴⁴ *DSV* XXVI "Prometheus" (*SEH* VI, 746-47/670 and 753/676).

⁴⁵ *DSV* "Prometheus" (*SEH* VI, 753/676). Bacon also says that Prometheus represents human nature in "Of Adversity," *Ess* (*OFB* XV, 18).

⁴⁶ Howard White argues that Bacon's Prometheus has a "dual nature, signifying Providence and human nature" but he distinguishes Prometheus from that "greater Providence" that he takes as his model in creating man. Like me, White believes that Bacon's Prometheus signifies a human providence set over against divine providence. See his *Peace Among the Willows*, 162-63.

⁴⁷ *DSV* "Prometheus" (*SEH* VI, 747/670).

⁴⁸ *DSV* "Prometheus" (*SEH* VI, 747/670).

⁴⁹ *DSV* "Prometheus" (*SEH* VI, 747/671). See also *AL* II (*OFB* IV, 96-97), where Bacon repeats the claim that the body is of all natural things the most compounded, but insists that the soul is the simplest of substances.

excellence of power resides in mixture and composition.”⁵⁰ In both the Prometheus myth and the *Genesis* account man is created from clay or dust. But there is nothing in the Prometheus myth answering to the divine breath God breathed into Adam’s nostrils to make him a living soul. Prometheus does not make man in his own image. Instead, Prometheus creates man by mixing together particles from all the other animals. Mind, intellect, and providence can be derived from brutish and irrational principles after all.

The differences between the two creation stories do not end there. In the biblical account, Adam is placed in a garden planted with every tree pleasant to the sight and every tree good for food. God satisfies Adam’s one want, for a suitable companion. According to Bacon, the Prometheus myth teaches, to the contrary, that “man in the first stage of his existence is a naked and defenceless thing, slow to help himself, and full of wants.”⁵¹ Man is needy and insecure by nature, and only he can improve his own lot. That teaching only seems to be contradicted by what Bacon says “appears” to be the “chief aim” of the parable, to teach that “Man, if we look to final causes, may be regarded as the centre of the world.”⁵² Bacon’s notorious rejection of final causes in natural philosophy admits one exception, “insofar as it [the inquiry into final causes] relates to the action of man.”⁵³ His interpretation of the myth seems to go much farther, suggesting not just that man acts for the sake of some end, but more grandly that “the whole world works together in the service of

⁵⁰ *DSV* “Prometheus” (*SEH* VI, 747/671).

⁵¹ *DSV* XXVI “Prometheus” (*SEH* VI, 747-48/671).

⁵² *DSV* “Prometheus” (*SEH* VI, 747/670).

⁵³ *NO* II §2 (*OFB* XI, 201). At *NO* I §48 (*OFB* XI, 85-87), Bacon rejects final causes without exception. When man’s search for what is first or ultimate fails, he “falls back on something closer to, namely final causes which obviously come from the nature of man rather than of the universe.” In *AL* and *DAS*, Bacon seems to speak more approvingly of final causes. They are not false, just misplaced. He assures his readers that there is no real “Enmitie or repugnancie” between physical and final causes. Where final causes express an “intention,” physical causes declare “a consequence onely.” Since they are perfectly compatible, final causes are perfectly redundant. Bacon’s reformed science of forms can, without any need for knowledge of final causes, enlarge and free operation to “the vtmost *possibilitie* of *superinducing* that *Nature* vpon *any varietie of Matter*.” Final causes are unknowable, anyway. As a great and deep politician can make other men the instruments of his will without revealing to them his purpose, God’s will is secret and not, finally, coincident with natural or physical causes. “Nature intendeth one thing, and Prouidence draweth forth another.” See *AL* II (*OFB* IV, 85-87) and *DAS* III.4 (*SEH* IV, 362-65).

man.”⁵⁴ But Bacon’s examples instead show how man makes use of the whole world.⁵⁵ The middle sky affords man prognostications of weather, but only if man marks them intelligently. The winds sail his ships and work his mills and engines, but only if man first builds them. When he turns to plants and animals—beings that might plausibly be said to pursue purposes or have ends of their own—Bacon transfers all agency to human beings. “[T]here is nothing,” he says, “from which [man] does not derive use and fruit.” Plants and animals “are made to furnish” man with shelter, clothing, food, and medicine, to lighten his labor and give him pleasure and comfort. Their service to man, however, is rarely voluntary. The hare and the deer flee the hunter; until the farmer breaks them, the horse and the ox refuse the yoke. If “all things seem to be going about man’s business and not their own,” it is because man has pressed them into compulsory service. Without man, nature “would seem to be all astray, without aim or purpose, to be like a besom without binding, as the saying is, and to be leading to nothing.”⁵⁶ To bind nature, then, and bend it to some purpose, man and man’s purposeful action alone suffices. We may regard man as the center of the world without supposing that the world itself was made for man. Instead, man is the the world’s final cause insofar as he has providentially remade the world for himself, which is possible only because the world as a whole and the non-human things within it, are of themselves not ordered to their own ends or anything else.

A further consideration of the differences between the Prometheus myth and the biblical account of creation supports this conclusion. In the biblical account, God is the sole creator. His creation culminates on the sixth day with the creation of man, a being in His own image and after His own likeness. The work of the first five days were good in themselves, but the addition of man

⁵⁴ *DSV* “Prometheus” (*SEH* VI, 747/670).

⁵⁵ Studer, too, notes that Bacon’s examples fail to demonstrate that nature is purposive or that man is nature’s final cause. Rather, “The point seems to be that if man can use these things he may. Man should therefore develop the opinion about nature that if it does not seem to be working to his advantage, he is not looking at it correctly” since “indeed man is very needy and must learn to believe that he deserves to acquire more.” See “Strange Fire at the Altar of the Lord”: Francis Bacon on Human Nature,” 215-17.

⁵⁶ *DSV* “Prometheus” (*SEH* VI, 747/670).

completes creation and makes it as a whole *very* good. Man's place in creation is confirmed when God grants him dominion over all the animals and gives him the fruit of every seed-bearing tree for food. In the Prometheus myth, however, Prometheus's creation is limited to man. Because he is not responsible for the rest of nature, he cannot make man nature's final cause. Nor is dominion over creation within his gift. The best he can do for man is provide him with the means to care for himself, to gain for himself dominion over nature and make himself, as it were, nature's final cause. Prometheus gives man fire, that "which in all human necessities and business is the great minister of relief and help."⁵⁷ Fire directly provides protection against the elements, wild animals, and also other men. With the aid of fire, a greater variety of plants and animals can be made edible. But more importantly, fire advances "in an infinite variety of ways" the arts and sciences. "If," as Aristotle said, "the soul be the form of forms and the hand the instrument of instruments," just as truly may fire "rightly be called the help of helps and the means of means."⁵⁸ Man's "natural" endowments—his mind and his hands—must be supplemented by power stolen from the gods.

So far, we have discovered two principal facts about man. Man is the most excellent of existing things because he is the most composite and therefore the most plastic and plenipotent of all existing things. Mind or intellect are made of the same stuff as everything else, just better mixed. Harsh and incredible as it may seem, the high emerges from the low. Man's excellence is not, as it is in the biblical account, a difference in kind or a greater likeness to God; he ranks above the rest of nature not because he is more noble, but because he is more powerful. Only man can make himself the center of the world. This first fact describes how man is able to master nature. The second fact explains why he must. In the first stage of his existence, man is a naked and defenseless thing.

⁵⁷ *DSV* "Prometheus" (*SEH* VI, 748/671).

⁵⁸ *DSV* "Prometheus" (*SEH* VI, 748/671). Bacon alludes to Aristotle, *De Anima* III.8, 432a1-2.

Unlike any other being, he meets his needs by developing arts and sciences. Man lives and lives well only through his knowledge.

About man's neediness, and with some qualification, Bacon's interpretation of the Prometheus myth and the biblical account agree. Adam and Eve are set in the garden to dress and keep it. They are not wholly idle, but neither do they labor out of necessity. Only through their disobedience do Adam and Eve incur the curse that condemns them to eat the fruit of the earth in sorrow and in the sweat of their faces. Man's situation after the expulsion from Eden is either what he is "by nature"—what he is in himself, once God revokes the most obvious divine supports—or what he becomes through God's curse. In either case, it becomes clear that the abundance, safety, and companionship he enjoys in the garden are his only through God's gracious gift. Man is profoundly and inescapably dependent. On his own, man's life is short, hard, and full of sorrow, and nothing within his power can essentially improve his lot. He works because he must, and that work will always be burdensome. The character of man's defection and the terms of God's curse confirm this fact. Man first sins in trying to assert his independence. The serpent tempts Eve with freedom or self-sufficiency. If she and Adam will eat of the fruit of the tree of knowledge, they will become, he promises, "as gods." Godhead comes through knowledge—in the *Genesis* account it is specifically knowledge of good and evil—from what Eve can *see* for herself rather than what she *hears* from God or Adam.⁵⁹ Eve exercises her own judgment before eating of the fruit; she sees that the fruit of the tree was good, pleasant, and *desirable*. Eve's judgment differed from God's, and what He prohibited did not become bad or unpleasant or undesirable in itself. God's command, then, is not what makes the tree good or bad, just as His pronouncement that His creation was good or very good did not

⁵⁹ Cf. *Genesis* 3:5-7 with *Genesis* 2:16-17 and 3:8-10. God prohibits the eating of the tree of knowledge before He creates Eve. Unless He repeats His command, Eve hears of it from Adam. God *sees* that His creation is good; we, and presumably Adam and Eve, too, must *hear* that it is good. *Genesis* 3:9 suggests that *pleasure* rather than *knowledge* ought to be the aim of man's sight.

make it so. Eve's judgment implies, in fact, that God can prohibit what is good in itself, that His command can be distinguished from what is true in itself or that, as the serpent had insinuated, God can lie. Eve's defection from God occurs not in eating the fruit, but in considering for herself whether she ought to. Eating the fruit opens their eyes to their dependency. They see that they are naked, and they are ashamed. They suffer their greatest loss—alienation from God on whom they must depend—before God learns of their transgression. God punishes Adam and Eve by giving them just what they wanted, an independence that, for them, can only be misery. To try to remedy their situation through their own initiative could only deepen their misery.

Bacon's interpretation of the Prometheus myth teaches just the opposite. With imperfect materials and limited power, Prometheus could not have made man better or more self-sufficient than he is. When he sees how weak and defenseless his creation is, he flouts other gods to secure man's well-being. Whatever he signifies, Prometheus unquestionably belongs to the party of man. Human life would be impossible without Prometheus's theft. Moreover, his gift is liberating. Fire makes possible the arts, and those arts aim ultimately at self-sufficiency. Fire is only the seed. Man must take it upon himself to develop and further those arts and sciences "in an infinite variety of ways." The reward for his initiative is a measure of independence and self-reliance. He need not beg for his food or pray for his safety since he can artfully provide for himself.

4.1.3 The Crime of Ingratitude

The second part of Bacon's interpretation describes "the state of man in respect of arts and matters intellectual"; the third part, "Religion."⁶⁰ Both ultimately concern the relation of man to the

⁶⁰ *DSV* "Prometheus" (*SEH* VI, 750/673).

gods. In *Genesis*, man's sinful rebellion begins his suffering. In the Prometheus myth, on the contrary, man's well-being depends on a crime. But which? In the end, Jupiter accuses Prometheus of four crimes: he stole fire, he mocked Jupiter's majesty by sacrificing to him a mock bull, he rejected the gift of Pandora's vase, and he tried to rape Minerva. There is also mankind's crime: ingratitude. After receiving so great benefit from Prometheus, men "fell to remonstrance and indignation, and brought an accusation before Jupiter both against Prometheus and against Fire."⁶¹ So pleased was Jupiter and the other gods that, contrary to what "justice may seem to have required," they allowed man the continued use of fire and bestowed on them a new gift, perpetual youth.⁶² Man's accusation and the gods' delight in it are, Bacon says, "remarkable."⁶³ "For how," he asks, "should the crime of ingratitude towards their maker, a vice which includes in itself almost all others, deserve approbation and reward?"⁶⁴ How indeed? Bacon's shift to the interrogative and his repeated expressions of wonder suggest that we have come to the heart of what he believes this story can teach us about the state of man. A careful consideration of that original crime will corroborate and deepen what we discovered in thinking through the myth's account of man's creation and constitution.

Bacon almost immediately disavows his own characterization of the puzzle. Man is rewarded not for ingratitude toward his maker, he assures, but for accusing his own nature and his art. But what really is the difference? If I fault my nature, am I not faulting its creator? If I blame my art, am I not blaming my teacher? Still, Bacon says that "complaints against nature and the arts is a thing well pleasing to the gods, and draws down new alms and bounties from the divine goodness."⁶⁵ "[I]t

⁶¹ *DSV* "Prometheus" (*SEH* VI, 745/669).

⁶² *DSV* "Prometheus" (*SEH* VI, 745/669).

⁶³ *DSV* "Prometheus" (*SEH* VI, 748/671).

⁶⁴ *DSV* "Prometheus" (*SEH* VI, 748/672).

⁶⁵ *DSV* "Prometheus" (*SEH* VI, 749/672).

was not the divine goodness that was wanting”; man failed himself.⁶⁶ For “by the true use of fire, and by the just and vigorous accusation and conviction of the errors of art, such gifts [eternal youth] might have been compassed.”⁶⁷ Yet to make man responsible for his nature and his art and the improvement of both is finally to say that the good he receives thereby is no gift at all, that whatever he gets is what he deserves. Man’s ingratitude toward his maker is one and the same with his decision to take responsibility for his own well-being, to be the arbiter of his own fortune. Within this teaching about man’s necessary self-reliance is a teaching about man, nature, and God, though Bacon is careful to obscure both the more immediate lesson and its broader significance. But he leaves enough clues for his more careful readers to discover his real meaning.

Bacon’s gnomic assertion that ingratitude comprehends all or almost all other crimes suggests that the myriad crimes reported in the myth might somehow be reduced to just one, original crime. A first reduction forces us to abandon the distinction between Prometheus’s and mankind’s crimes. Whatever Prometheus signified in the part of the interpretation concerned with the creation of man, here, in the part of the myth dealing with crime and its punishment, Prometheus signifies human forethought. Bacon confounds Prometheus’s and mankind’s punishments. To avenge Prometheus’s mock sacrifice, Jupiter sends Pandora and her vase full of mischiefs and calamities, “seeing that there was no way to take down the insolence of Prometheus except by chastising the human race.”⁶⁸ Justly or not, mankind is punished in retribution for Prometheus’s crime. That displaced punishment seems gratuitous since Jupiter also in the end dragged Prometheus to the mountains, chained him to a column, and contrived for him a perpetual torture, that every night his liver would regenerate only to be gnawed and consumed again by an

⁶⁶ *DSV* “Prometheus” (*SEH* VI, 749/673).

⁶⁷ *DSV* “Prometheus” (*SEH* VI, 749/673).

⁶⁸ *DSV* “Prometheus” (*SEH* VI, 745/669).

eagle. In Bacon's interpretation, however, Prometheus's torture symbolizes the gnawing anxieties that plague the more forethoughtful type of man. Mankind, or some part of it, suffers Prometheus's punishment. Mankind and Prometheus have merged into one.

Turning next to the crimes themselves, we notice that all five concern gifts, gift-giving, and the receiving of gifts. In each case, a gift passes between man and gods. Prometheus gives fire that was not his to give. He offers to Jupiter a vindictive gift which is really no gift at all. Prometheus and Promethean men spurn the gods' gift of pleasure; Epimetheus and Epimethean men accept a gift heedlessly. Prometheus and "men . . . puffed up with arts and much knowledge" try to take for themselves divine wisdom that was not freely given. The crime specifically charged to man is ingratitude, the inappreciative receiving of a gift. For that crime, Jupiter gives man another gift—eternal youth. If ingratitude is the vice comprehending almost all other vices, perhaps gratitude—the virtue concerned with the giving and receiving of gifts—comprehends all or almost all the other virtues.

What is given or taken in each case is related to human arts and sciences. Prometheus's original gift is the fire by means of which man acquires arts and sciences as well as the means of furthering them. Man's ingratitude signifies "the accusation and arraignment by men of both their own nature and of art."⁶⁹ For his ingratitude, man is given eternal youth, but he loses it for lack of an adequate art. Both hypocritical worship and the pleasures that punish it arise from the arts. Only "with the cultivation of the arts came likewise the worship of things divine," Bacon says, though nothing in his telling of the fable suggests so.⁷⁰ The fable ascribes the creation of pleasure to Vulcan, who represents fire and so also the arts, he tells us, because the sensual appetite, "after the introduction of civil arts and culture and luxury, is kindled up as it were by the gift of fire." Finally,

⁶⁹ *DSV* "Prometheus" (*SEH* VI, 748/672).

⁷⁰ *DSV* "Prometheus" (*SEH* VI, 750/673).

Bacon likens the attempted rape of Minerva to man's attempt to extend his art to a kind of knowledge his art cannot or ought not compass. Thus the issue is human art: how man came by it, what it cost him, and to whom, if anyone, he owes thanks. Everything turns on whether forethought and fire are gifts of the gods or man's own achievements.

Man acquired the arts through Prometheus's theft and subsequent gift of fire. The arts seem to be a divine gift. Bacon certainly invites such a conclusion, but several considerations cut against it. Calling Prometheus's act a theft calls attention to the fact that all the gods save Prometheus denied to man the necessary means of his survival. The second divine gift reported in the myth—Jupiter's gift of eternal youth—again shows how improvident man's creation and constitution is. For man loses eternal youth to serpents, a detail Bacon explains may have been "inserted in shame of mankind, who with that fire of theirs and with so many arts, cannot acquire for themselves things which nature has of herself bestowed on many other animals."⁷¹ The gods' neglect of man becomes complete if, as I have argued, Prometheus more truly signifies human forethought. At any rate, Bacon goes out of his way to naturalize man's acquisition of fire. Seeing man's neediness, "Prometheus applied himself with all haste to the *invention* of fire."⁷² His invention was accomplished "according to the nature of the thing."⁷³ Fire is produced by violent collisions that set the parts of a body in motion, a truth we are asked to believe is figured in Prometheus's use of the fennel stalk. Bacon also goes out of his way to avoid characterizing Prometheus's invention as a theft, massaging the theft into a symbol for the "clandestine processes" that prepare earthly bodies to receive the heat of celestial bodies (which now stand in for the gods). Prometheus's gift turns out to be a small piece of natural knowledge, just the sort of discovery man's ingratitude is supposed to prompt. To

⁷¹ *DSV* "Prometheus" (*SEH* VI, 750/673). Notice also that Bacon calls it "that fire of *theirs*"—not the gods'—and makes nature—not the gods—the bestower of gifts.

⁷² *DSV* "Prometheus" (*SEH* VI, 748/671), emphasis added.

⁷³ *DSV* "Prometheus" (*SEH* VI, 748/671).

begrudge such knowledge to a creature who so desperately needs it seems the greater crime. Man's original neediness, unprovided for by the other gods, combined with the ambiguity about Prometheus's significance and Bacon's naturalizing of the discovery of fire, suggest that the arts are not a divine gift, that man discovers the arts for himself in the face of divine indifference.

Despite Prometheus's provident gift, man turns on him and, lacking all gratitude, accuses him before Zeus. Man's accusation and eventual reconciliation with Prometheus is perhaps the most perplexing part of Bacon's interpretation. Prometheus's invention becomes a crime only when men complain. If Prometheus's gift is, as I have argued, really man's self-reliant discovery of the arts, man's accusation is a self-accusation. Mankind conspires to renounce his arts and appeal instead to the gods. Jupiter and the gods welcome his self-incriminating accusation. They reward man with a new gift, eternal life. For repudiating his arts, man receives by divine gift what was denied him in his original creation and constitution. Bacon explains away the apparent injustice of Jupiter's judgment by reorienting man's ingratitude. Ingratitude against one's maker may indeed be a crime, perhaps the greatest, "hated by the gods, and unlucky." But Jupiter rewards men because they arraign "their own nature" and "art." Man merits eternal youth by holding himself responsible for his miserable condition. "Therefore," Bacon proclaims, "let all men know that the preferring of complaints against nature and the arts is a thing well pleasing to the gods, and draws down new alms and bounties from the divine goodness."⁷⁴

But man never receives the gods' promised gift. "[I]t was not the divine goodness that was wanting to them therein," Bacon says, "but that they [mankind] were wanting to themselves."⁷⁵ Such pious-sounding verdicts seem to agree with Christian theology in blaming man for his mortality. The two teachings, however, disagree in what makes man culpable. In *Genesis*, God expels man from the

⁷⁴ DSV "Prometheus" (SEH VI, 749/672).

⁷⁵ DSV "Prometheus" (SEH VI, 749/673).

garden after he eats of the tree of knowledge in order to keep him from eating also of the tree of life. Man loses eternal life in choosing to depend upon himself. Postlapsarian man's cultivation of the arts only perpetuates his parents' original sin. In "Prometheus," however, the divine promise of eternal life requires human art and industry. Jupiter and the other gods "indulged mankind with the use of fire," an indulgence that returns to man the means of self-sufficiency he tried to renounce. The gift of eternal youth is conditioned on the further development of those arts. Man loses his prize because his art is wanting. Eternal youth is a divine gift that man has to work for. He is condemned to live by his art whether or not the gods take an active interest in his well-being.

To claim his prize, man must turn on himself and his art, for the peculiarity of art is that it thrives only through self-censure. If ingratitude is a crime, it is a necessary one. In a truly remarkable twist, Bacon instead casts gratitude as the culpable crime. Those "who extravagantly extol human nature as it is and the arts as received; who spend themselves in admiration of what they already possess, and hold up as perfect the sciences which are professed and cultivated"—in short, those who are thankful for the good they have, slow to find fault, and reluctant to ask for any more—"are wanting, first, in reverence to the divine nature, with the perfection of which they almost presume to compare, and next in usefulness toward man; as thinking that they have already reached the summit of things and finished their work, and therefore need seek no further."⁷⁶ Adam and Eve lived happily knowing themselves to be created in God's image and perfect in their kind. They sinned in ungratefully believing themselves capable of becoming greater than they already were. An overreaching ambition misled them to irreverently think they could equal God. Without invoking them by name, Bacon wants to persuade us that Adam and Eve's sinful ingratitude is real virtue, that satiety and contentment and gratitude are the real sins.

⁷⁶ *DSV* "Prometheus" (*SEH* VI, 748/672).

The all-important shift is in where those complaints are directed. Hunger, disease, oppression, and death may incline the impious man to question God. The pious man will accept his suffering as his just punishment, as God's providential plan, as the cross he must bear. The impious man will find no relief; the pious man, only the satisfaction that comes from patient forbearance and his hope that all will come right in the next life. But those "who arraign and accuse nature and the arts, and abound with complainings"—those who direct their ingratitude toward what is within their control—are "more modest (if it be truly considered)" and "also stimulated perpetually to fresh industry and new discoveries."⁷⁷ Rather than ask forgiveness or pray for intercession, they search out "methods and medicines for the retardation of age and the prolongation of life."⁷⁸ Only "by the true use of fire, and by the just and vigorous accusation and conviction of the errors of art," not by inert grumbling and accusations shouted up to heaven, "might such gifts have been compassed."⁷⁹ Eternal youth, if it is possible at all, is possible only through our diligent effort. If we are to be self-reliant, we cannot afford to be self-satisfied. "[L]et them know," Bacon counsels, "that conceit of plenty is one of the principal causes of want."⁸⁰

Socratic philosophy is no better than pious prayers. Socrates did not take on faith a benevolent and provident god, but he wanted to find a principle that could explain the world in terms of the good. Plato and Aristotle philosophized as if the world were rational and ordered to both particular and general goods. At bottom, theirs were *grateful* philosophies. They were excelled by the ingrate philosophies of Empedocles and Democritus, both of whom "complain . . . that all things are hidden away from us, that we know nothing, that we discern nothing, that truth is

⁷⁷ *DSV* "Prometheus" (*SEH* VI, 748-49/672).

⁷⁸ *DSV* "Prometheus" (*SEH* VI, 749/672).

⁷⁹ *DSV* "Prometheus" (*SEH* VI, 749/673).

⁸⁰ *DSV* "Prometheus" (*SEH* VI, 749/672).

drowned in deep wells, that the true and the false are strangely joined and twisted together.”⁸¹ We will be more diligent inquirers and more active philosophers if we believe not only that we do not yet have the truth, but that truth is not easily discovered. Then we can seek for ourselves the goods neither the gods nor nature supply instead of spending ourselves in wondering and reverent contemplation of that which always or already is.

So man’s reconciliation with Prometheus, which comes only “after the frustration of their hope,” becomes necessary because of the terms of Jupiter’s gift.⁸² Divine providence itself requires man to embrace his own, provident art. Man is truly his own “maker and master” insofar as he becomes what he is only through his art.⁸³

But man’s accusation of Prometheus and subsequent reconciliation does work a momentous change. There is no malice in Prometheus’s initial theft of fire from the gods. He steals only for man’s good. If his act of benevolence in any way harms the gods, the hurt is inadvertent and regrettable. After mankind’s renunciation of Prometheus’s gift, however, Prometheus is “bitterly incensed against Jupiter.”⁸⁴ Neither he nor man has been punished at this point in Bacon’s retelling of the story. His anger arises, it seems, from a rivalry between him and Jupiter, the issue of which is mankind’s good and whether it is to come from Promethean arts or Jupiter’s divine gift. Jupiter delights because man would rather throw in his lot with Jupiter and the other gods than rely on Prometheus’s arts. Prometheus forgives man but cannot forgive Jupiter, the god who showed no regard for man’s good at his creation and who cannot free man from his reliance on Promethean arts. And so he arranges a mock sacrifice, an ungrateful display of gratitude, a cunning art disguised as the prayer of a needy supplicant. Bacon says that the worship of things divine begins with the

⁸¹ *DSV* “Prometheus” (*SEH* VI, 749/672).

⁸² *DSV* “Prometheus” (*SEH* VI, 750/673).

⁸³ *DSV* “Prometheus” (*SEH* VI, 749/672).

⁸⁴ *DSV* “Prometheus” (*SEH* VI, 745/669).

cultivation of the arts; the enmity between religion and human art is original and perpetual. Because Prometheus is in every other way identified with man, we can assume that man shares Prometheus's grievance and that he is moved to his spiteful sacrifice to revenge himself against an improvident and faith-breaking god. Or if we should not identify Prometheus and man, we can at least say that, in reconciling with Prometheus, man takes Prometheus's side against Jupiter. I said, above, that Prometheus is unquestionably of the party of man. Man, by necessity if not by choice, must be of Prometheus's party, too.

Bacon closes this brief explication of the "state of Religion" by making Christian scripture testify on behalf of Prometheus. Despite his earlier claim to deal exclusively with human wisdom, he quotes from *Isaiah*. The Lord does not ask as penance, sign of supplication, or display of thanks that we afflict our souls or humble ourselves by bowing our heads, dressing in sackcloth, and sitting in ashes. Instead, He commands that we set the oppressed free, that we feed the hungry and shelter the poor wanderer. If we do, the prophet promises, "the Lord shall guide thee continually, and satisfy thy soul in drought, and make fat thy bones: and thou shalt be like a watered garden, and like a spring of water, whose waters fail not."⁸⁵ To realize God's promise, we must first provide for ourselves and our fellow man. We do so best, Bacon argues, by continually advancing the arts. True gratitude is really the commendable and well-directed ingratitude that promotes what Bacon elsewhere calls the greatest of all virtues, *philanthropia*.⁸⁶ The love of man requires ingratitude toward God.

⁸⁵ *Isaiah* 58:11.

⁸⁶ *Ess* "Of Goodness And Goodness in Nature" (*OFB* XV, 38-39).

4.1.4 *Pleasure and True Human Greatness*

The final part of Bacon's interpretation concerns "morals and the conditions of human life."⁸⁷ It shows what price man must pay for his ingratitude. To punish Prometheus and man for the mock sacrifice Jupiter offers them an equally malicious gift. He has Vulcan make a fair and lovely woman, Pandora, and asks each of the gods to bestow on her his particular gift. This comely woman carries in her hands Jupiter's unremitting punishment: the "infinite mischiefs" pleasure and sensual appetite visit "upon the minds, the bodies, and the fortunes of men," kingdoms, and commonwealths alike.⁸⁸ Promised his greatest good, man instead gets from the gods his great torment. Pleasures and the mischiefs they carry are the artifact of Vulcan, the artisan god. Fittingly are they said to be introduced and kindled up by "civil arts and culture and luxury" since it is cunning and art which puts man at enmity with Jupiter.⁸⁹ Man's saving art is also his undoing.

The parable presents two models of man's moral condition, two pictures, that is, of how man can receive Jupiter's vengeful gift. Neither is adequate. The improvident followers of Epimetheus, having no care for the future, indulge in whatever is immediately pleasant and so "suffer many distresses, difficulties, and calamities, and are engaged in a perpetual struggle."⁹⁰ The "wise and fore-thoughtful class of men," those in the Promethean model, avoid these evils and misfortunes but "stint themselves of many pleasures and of the various agreeableness of life, and cross their genius, and (what is far worse) torment and wear themselves away with cares and solicitude and inward fears."⁹¹ (The "truly religious man," the man who, "with zeal burning and rising upward for the glory of God," reverently sacrifices the best portion serves as a foil to

⁸⁷ *DSV* "Prometheus" (*SEH* VI, 751/674).

⁸⁸ *DSV* "Prometheus" (*SEH* VI, 751/674).

⁸⁹ *DSV* "Prometheus" (*SEH* VI, 751/674).

⁹⁰ *DSV* "Prometheus" (*SEH* VI, 751/674).

⁹¹ *DSV* "Prometheus" (*SEH* VI, 751/674).

Prometheus's hypocrisy but not, apparently, as model of the moral life.)⁹² If men could somehow combine the carefree pleasures of Epimetheus with the careworn prudence of Prometheus, if they could somehow "retain the advantages of providence and yet free themselves from the evils of solicitude and perturbation," they would be happier.⁹³ Pleasure itself is good, and the goal ought to be to enjoy it as far as one can without suffering for it.

Bacon's ideal sounds a lot like rational hedonism. We want to enjoy what is pleasant and agreeable while avoiding what is hurtful, and reason's job is to optimize by making choices that maximize pleasure and minimize harm. Different moral judgments can be reduced to different optimizing strategies. If pleasures' costs are reckoned high, the good life consists in a tranquility untempted by pleasure's siren song. A different accounting favors those purer pleasures that can be enjoyed at little or no cost. Bacon's own teaching, though, is more profound and more tragic. For by his calculation, our greatest torments are those anxieties we suffer because we providently care for what tomorrow and the next day will bring. We desire the longevity and good health Jupiter promised, but must get them for ourselves. By provident art, we aim to relieve our suffering, supply our wants, and sate our appetites by "an infinity of devices," as Descartes would later put it, "that would enable one to enjoy trouble-free the fruits of the earth and all goods found there."⁹⁴ But the very forethought that makes provision is also the origin of those worries that trouble our thoughts and "prick and gnaw and corrode the liver."⁹⁵ Because prudence and art cause their own troubles, nothing had through prudence and art can be truly trouble-free. Art is the source of man's good as well as man's ill. We seem fated to suffer, as Epimetheus, from our heedless enjoyment of present

⁹² DSV "Prometheus" (SEH VI, 750/673).

⁹³ DSV "Prometheus" (SEH VI, 752/675).

⁹⁴ Descartes, *Discourse on Method*, Part Six (A-T p. 62). I have used the translation in René Descartes, *Discourse on Method and Meditations on First Philosophy*, trans. by Donald A. Cress (Indianapolis: Hackett Publishing Company, 1988), 35.

⁹⁵ DSV "Prometheus" (SEH VI, 752/674).

pleasures or, as Prometheus, from forethought's anxieties and the loss to care of the pleasures that could sweeten life's miseries.

Man's situation would be hopeless if the Promethean and Epimethean types exhausted the moral possibilities open to man. Fortunately there is a third possibility figured in Hercules's rescue of Prometheus. By "fortitude and constancy of mind," Hercules brings together providence and pleasure. "[P]repared for all events and equal to any fortune," such a man "foresees without fear, enjoys without fastidiousness, and bears without impatience."⁹⁶ This virtue was not natural to Prometheus, Bacon notes, "but adventitious."⁹⁷ Yet it is not like those Christian virtues infused by grace. Hercules's rescue, like Prometheus's theft, willfully undoes what Jupiter had willfully done. His great feats are his alone. His "true greatness," Bacon says, "is to combine in one the frailty of man and the security of God."⁹⁸ If Prometheus signifies human nature, Hercules seems to signify that excellence beyond human nature for which man should strive.

We should like to better understand Hercules, this savior of human nature. Unfortunately, Bacon does not include among his thirty-one interpretations a chapter dedicated to the stories told of the hero. Hercules, however, does figure in two other myths.⁹⁹ "Achelous, or the Battle" suggests a tenuous connection between Odysseus and Hercules, but the more important text is "Orpheus, or Philosophy."¹⁰⁰ Starting with it, I will follow a trail of allusions—an unavoidably speculative and circuitous strategy—to try to better understand Bacon's Herculean-Promethean ideal.

⁹⁶ *DSV* "Prometheus" (*SEH* VI, 752/675).

⁹⁷ *DSV* "Prometheus, or the State of Man" (*SEH* VI, 752/675).

⁹⁸ *DSV* "Prometheus" (*SEH* VI, 752/675) Cf. *AL* II (*OFB* IV, 135) and *Ess* "Of Adversitie" (*OFB* XV, 18). Bacon is paraphrasing Seneca, *Epistulae morales ad Lucilium* LIII.

⁹⁹ "Achelous, or the Battle" and "The Sirens, or Pleasure." Bacon makes a passing reference to Hercules's acquired divinity in a retelling, in *DAS*, of "Perseus, or War," though the version of the fable in *DSV* does not mention him. Cf. *DAS* II.13 (*SEH* IV, 329) with *DSV* "Perseus, or War" (*SEH* VI, 715/664).

¹⁰⁰ In "Achelous, or the Battle," Bacon tells of a battle between Hercules, who keeps "his wonted human figure," and shape-shifting Achelous, now in the form of a bull. In close combat, Hercules breaks off Achelous's horn. To get it back, he gives Hercules Amalthea's horn, the horn Zeus blessed so that it would provide its own with whatever he desired. This fable, which Bacon says "alludes to military expeditions," bears an obvious likeness to "Proteus, or

Bacon's reference to Hercules in "Orpheus, or Philosophy" seems oddly gratuitous, made only to magnify the figure of Orpheus. "For as the works of wisdom surpass in dignity and power the works of strength," Bacon says, "so the labours of Orpheus surpass the labours of Hercules."¹⁰¹ The comparison is between the *works* of each, and Orpheus's works are said to excel Hercules's in dignity and *power*. Yet Orpheus fails to accomplish his works and Hercules succeeds in his. When Orpheus fails in his second and lessor labor, he suffers a horrific death. The Thracian women tear him to pieces and scatter his limbs. Hercules, though he suffers a painful death, merits apotheosis. This, too, is odd: Bacon says that Hercules saves Prometheus not by "any inborn or natural fortitude" or strength, but a courage born of *wisdom* and "meditation upon the inconstancy and fluctuation of human life."¹⁰² On closer inspection, Hercules seems both more powerful and more wise than Orpheus.

Why does Hercules succeed and Orpheus fail? The story of Hercules's rescue concerns (as we saw) "morals and the conditions of human life" and is chiefly a teaching about pleasure and desire. Desire is what twice defeats Orpheus. He attempts, first, to rescue his dead wife from Hell. But "in the impatience of love and anxiety," Orpheus looks back and so loses his wife again to the infernal powers.¹⁰³ Orpheus turns to his second labor only after his first is frustrated, and like the greater work, this lesser work at first prospers. Orpheus's sweet song tames the wild beasts and brings about a gentle, sociable, and decent order of things. Harmony and order reign until certain

Matter," where another shape-shifting god is bested. There, a bound Proteus is made to take all possible shapes and so reveal "the sum and general issue . . . of all things past, present and to come," or what we in our ignorance call the *vicissitudes of things*. Odysseus, of course, is the best-known of those who wrested from Proteus some knowledge of those vicissitudes. This connection between Hercules and Odysseus should be compared to the more robust connection between the two heroes I trace in the main text. Cf. *DSV* "Achelous, or the Battle" (*SEH* VI, 739-40/663-64) with *DSV* "Proteus, or Matter" (*SEH* VI, 726/652). See also *DSV* "Nemesis, or the Vicissitude of Things" (*SEH* VI, 737-39/662-63), where Bacon characterizes the flow and ebb of things past, present, and to come as "the dark and secret judgment of God."

¹⁰¹ *DSV* "Orpheus, or Philosophy" (*SEH* VI, 720/647).

¹⁰² *DSV* "Prometheus, or the State of Man" (*SEH* VI, 752/675).

¹⁰³ *DSV* "Orpheus, or Philosophy" (*SEH* VI, 720/647).

Thracian women, stirred to a frenzy by Bacchus, drown out Orpheus's music. The master of all harmony could not escape the furies of Bacchus's followers.¹⁰⁴

Bacchus is Dionysus, and Dionysus, Bacon says, signifies desire. The story of Dionysus also "bears on morals, and indeed," Bacon avows, "there is nothing better to be found in moral philosophy."¹⁰⁵ What Dionysus teaches us is that desire can be tempered and chastised for some time, but not finally sated or destroyed. Passion or desire undertakes "an endless course of conquest" and "never rests satisfied with what it has, but goes on and on with infinite insatiable appetite panting after new triumphs."¹⁰⁶ Passion triumphs over reason, desiring all the more what experience and reason have spurned. Unable to curb passion, reason must either serve it or be destroyed.¹⁰⁷

The figure of Dionysus does not show us what we should do about rampant desire. It only shows us why Orpheus's—and so, too, philosophy's—attempt to master desire through persuasion was fated to fail. For a time, Orpheus's song drew "all kinds of wild beasts, in such manner that putting off their several natures, forgetting all their quarrels and ferocity, no longer driven by the stings and furies of lust, no longer caring to satisfy their hunger or hunt their prey, they all stood about him, as in a theatre, listening only to the concords of his lyre."¹⁰⁸ Likewise,

Philosophy finding that her great work is too much for her . . . turns to human affairs; and applying her powers of persuasion and eloquence to insinuate into men's minds the love of virtue and equity and peace, teaches the peoples to assemble and unite and take upon them

¹⁰⁴ Specifically, Orpheus is destroyed by a *religious* frenzy. "Nor is it wonderful that superstitious rites are attributed to Bacchus," Bacon says, "since every insane passion grows rank in depraved religions; or if phrensies are supposed to be inflicted by him, seeing that every passion is itself a brief madness, and if it be vehement and obstinate ends in insanity." Depraved religion is just one form—a particularly potent form—that ungoverned passion can take. The more general moral problem is desire or passion.

¹⁰⁵ *DSV* "Dionysus, or Desire" (*SEH* VI, 741/665).

¹⁰⁶ *DSV* "Dionysus, or Desire" (*SEH* VI, 742/666).

¹⁰⁷ *DSV* "Dionysus, or Desire" (*SEH* VI, 742/666). Bacon pictures "cruel, savage, and pitiless" passion riding in a chariot "as in celebration of its victory and triumph over reason."

¹⁰⁸ *DSV* "Orpheus, or Philosophy" (*SEH* VI, 721/647).

the yoke of laws and submit to authority, and forget their ungoverned appetites, in listening and conforming to precept and discipline.¹⁰⁹

But Orpheus's song cannot last forever. The "works of wisdom," though "among human things the most excellent," nevertheless "have their periods and closes."¹¹⁰ Because "every passion flourishes and acquires vigour by being resisted and forbidden," precept and discipline strengthen the very passions they momentarily restrain.¹¹¹ Invigorated desire must eventually overwhelm persuasion and break eloquence's charm. Orpheus's spell broken, "the beasts returned each to his nature and preyed one upon the other as before," and passion, inflamed and grown mad, turns on philosophy.¹¹² Like Orpheus, philosophy is overcome by the vicissitudes of things because it misunderstands desire.

Bacon returns to the problem of pleasure in the thirty-first and final fable, "The Sirens, or Pleasure." Here again, he shows us Orpheus's misunderstanding of desire and pleasure. The story manifestly concerns the "allurements of pleasure," but its true teaching—or at least the interpretation Bacon wishes to impose upon it—is more secret. Men have taken it only "in a very poor and vulgar sense."¹¹³ The "fatal effect" of pleasure "is everybody's theme, and therefore needs no interpreter." Again, it is "obvious," Bacon says, that pleasure charms men and carries them away unless "doctrine and instruction have succeeded in teaching the mind, if not to refrain altogether, yet to pause and consider consequences."¹¹⁴ That "obvious" teaching, however, is just what Bacon argued against in "Orpheus" and "Dionysus." The "the wisdom of the ancients" is "like grapes ill-trodden: something is squeezed out, but the best parts are left behind and passed over."¹¹⁵

¹⁰⁹ *DSV* "Orpheus, or Philosophy" (*SEH* VI, 722/648).

¹¹⁰ *DSV* "Orpheus, or Philosophy" (*SEH* VI, 722/648).

¹¹¹ *DSV* "Dionysus, or Desire" (*SEH* VI, 743/667).

¹¹² *DSV* "Orpheus, or Philosophy" (*SEH* VI, 721/647).

¹¹³ *DSV* "The Sirens, or Pleasure" (*SEH* VI, 762/684).

¹¹⁴ *DSV* "The Sirens, or Pleasure" (*SEH* VI, 763/684).

¹¹⁵ *DSV* "The Sirens, or Pleasure" (*SEH* VI, 762/684).

Perhaps we will discover the ancients' leftover wisdom if we first see what juice was got from its first squeeze. The Greeks who succeeded these fables' forgotten authors taught men above all to scorn pleasure. Philosophy especially "could induce a contempt of Pleasures" and so, it seemed, "lift the soul from earth, and make the cogitations of man . . . winged and ethereal."¹¹⁶ A "finer point," a point they missed, suggests that examples of other men's calamities—a particularly effective type of instruction, one would think—cannot deter men from seeking ruinous pleasures.¹¹⁷ Doctrine and instruction succeed, if they succeed at all, not in teaching men prudence or the wise management of pleasure, but to falsely believe themselves superior to pleasure.

If sermons, moral philosophies, and cautionary tales cannot check man's desire, what can? Bacon's last paragraph—last of this particular interpretation and last of the whole work—concerns remedies. Its teaching is "not at all abstruse," which is not quite the same as saying that its teaching is evident. There are "three remedies; two from philosophy, the third from religion." Earlier, however, Bacon had enumerated only two remedies, that found by Ulysses (Odysseus), the other by Orpheus. The later addition—the remedy used by Odysseus's crew—is "the only remedy" for "minds of ordinary and plebeian cast."¹¹⁸ Most men must wax their ears and deafen themselves to the allurements of pleasure. We know that this remedy comes at great cost, that in providently providing against mischiefs men torment themselves and lose life's more agreeable pleasures. We also know that this remedy cannot last, that restrained desire grows until it can be restrained no more.¹¹⁹ Such men seem destined to alternate between anxious rectitude and heedless indulgence.

"[F]ar the best in every way" is Orpheus's solution, Bacon says, but it differs from the more plebeian solution only slightly. Both deny pleasure any hearing. The Orphic songs have a

¹¹⁶ *DSV* "The Sirens, or Pleasure" (*SEH* VI, 763/684-85).

¹¹⁷ *DSV* "The Sirens, or Pleasure" (*SEH* VI, 763-64/685).

¹¹⁸ *DSV* "The Sirens, or Pleasure" (*SEH* VI, 764/685).

¹¹⁹ Later in Homer's poem, Odysseus's men, gnawed by hunger, ignore Odysseus's command and work their own destruction by slaying Helios's cattle. See *Odyssey*, Book 12.

“sweetness” of their own. By meditating on things divine and “singing and sounding forth the praises of the gods,” Orpheus confounds the Sirens’ song. But, as we have learned from “Orpheus,” the Orphic solution is as ill-fated as the more plebeian remedy. Unruly passion eventually drowns out Orphic harmony and returns those made mild by Orpheus’s song to their wild and unreclaimed natures. Of the three remedies, Orpheus’s is surely the one Bacon here categorizes as religious. Yet that characterization is odd considering that, earlier in *De sapientia veterum*, he allows Orpheus to stand as the representative of universal philosophy.¹²⁰ Of course, the philosophy represented by Orpheus is more akin to frustrated Presocratic natural philosophy and Socratic moral and political philosophy than it is to Bacon’s own, new philosophy. By using Orpheus to represent both Socratic philosophy and religion, Bacon hints at an affinity between the two.

The second and greater philosophic remedy is Odysseus’s. Like Odysseus, “minds of a loftier order” may “fortify themselves with constancy of resolution (*si decreti constantia se muniant*)” and “venture into the midst of pleasure.”¹²¹ Bacon’s choice of words seems calculated to harken back to the fortitude and constancy of mind (*fortitudinem et animi constantiam*) of the hero, Hercules.¹²² Lesser men lacking fortitude or constancy must wax their ears or sing divine songs, but it is “heroes of this order”—not gods, but godlike men—who “may therefore stand unshaken amidst the greatest temptations, and refrain themselves even in the steep-down paths of pleasure.”¹²³ This is hardly a counsel of moderation. Bacon rather makes a sort of Promethean accommodation: the forethoughtful man endowed also with fortitude and constancy of mind may indulge in some of the pleasures that stern moral doctrine forbids. The reward for such heroic virtue is not pleasure itself or not pleasure alone, but also a kind of wisdom. By lashing himself to the mast of his ship, Odysseus

¹²⁰ *DSV* “Orpheus, or Philosophy” (*SEH* VI, 720/646).

¹²¹ *DSV* “The Sirens, or Pleasure” (*SEH* VI, 764/685).

¹²² *DSV* “Prometheus, or the State of Man” (*SEH* VI, 752/675).

¹²³ *DSV* “The Sirens, or Pleasure” (*SEH* VI, 764/685-86).

and his like gain “a more thorough insight—as lookers on rather than followers—into the foolishness and madness of pleasure.” They must also “delight in thus putting their virtue to a more exquisite proof” and take some joy in knowing and feeling their own superior strength, a knowledge that can only come if they put that strength to the test.¹²⁴ Human nature, like non-human nature, is best revealed when it is vexed.¹²⁵

“Prometheus” deepens this teaching about desire without satisfactorily solving it. We learn that the arts stimulate sensual appetite and the desire for pleasure. We also learn that the artful pursuit of immortality and health and trouble-free pleasure, because our art falls short of true self-sufficiency, causes those anxieties and fears that spoil whatever good we have. Art is the source of our troubles and someday, we hope, their cure. In the meantime, we need Herculean fortitude, the constancy of mind to withstand fortune while at the same time we intrepidly try to master it. That fortitude is born of a wisdom about the “inconstancy and fluctuations of human life.” It “comes from beyond the ocean.”¹²⁶ “Prometheus” shows us why that wisdom is needful; it does not show us how to get it.

One other figure in *De sapientia veterum* is said to be wise about human things: Oedipus, “a man of wisdom and penetration.”¹²⁷ Perhaps Oedipus’s wisdom will give us some clue about the wisdom Hercules brings.

Oedipus shows up in “Sphinx, or Science.”¹²⁸ The Sphinx poses two sorts of riddles, “one concerning the nature of things, another concerning the nature of man.”¹²⁹ Whoever solves these riddles becomes ruler of a kingdom: a master over nature or a master over men. Rule over nature is

¹²⁴ *DSV* “The Sirens, or Pleasure” (*SEH* VI, 764/764).

¹²⁵ Cf. *ES* “Of Adversity” (*OEB* XV, 18-19).

¹²⁶ *DSV* “Prometheus, or the State of Man” (*SEH* VI, 752/675).

¹²⁷ *DSV* “Sphinx, or Science” (*SEH* VI, 755/678).

¹²⁸ “Sphinx, or Science,” is the eleventh fable in *DSV* (*SEH* VI, 720-22/646-48).

¹²⁹ *DSV* “Sphinx, or Science” (*SEH* VI, 757/679).

the “one proper and ultimate end of true natural philosophy,” Bacon says, and he who “has a thorough insight into the nature of man may shape his fortune almost as he will, and is born for empire.”¹³⁰ The Sphinx poses to Oedipus a riddle about human nature. In solving it, he becomes king of Thebes. Oedipus’s real-life counterpart is Augustus Caesar, a man who “certainly excelled in the art of politics if ever man did” because he “succeeded in the course of his life in solving most happily a great many new riddles concerning the nature of man.”¹³¹ Because of his wisdom, Augustus is able to master fortune and the vicissitudes of things to a very great degree. But neither Oedipus nor Augustus enjoy complete mastery of their fate. For all that he knows about human nature, Oedipus does not know enough about himself and shrinks from his fate instead of meeting and mastering it. Had he faced the prophecy with the same “confidence and alacrity” with which he met the Sphinx, perhaps he would have been able to save himself. Bacon would have thought Augustus Caesar “of all men the most fortunate.” He had “a certain art of using and enjoying his fortune” and Herculean fortitude and constancy, yet even he suffered as fortune’s victim.¹³² Evidently mastering human nature is not enough.

The complete mastery of fortune would require the united rule of both man and nature and so a wisdom about both human and non-human nature. The Sphinx is science, especially science applied to the exigencies of life. Because he is wise about human things, Oedipus can vanquish science. His wisdom anticipates one of the central insights that gives shape to Bacon’s method. The human mind tends to fly to the highest generalities, to first and final causes. Thus method “should not supply the human intellect with wings but rather with leaden weights to curb all jumping and

¹³⁰ *DSV* “Sphinx, or Science” (*SEH* VI, 757/679).

¹³¹ *DSV* “Sphinx, or Science” (*SEH* VI, 757/679).

¹³² *DSV* “Nemesis, or the Vicissitude of Things” (*SEH* VI, 738/662).

flying up.”¹³³ Likewise, club-footed Oedipus solves a riddle that would have stumped a fleeter-footed man who never had need of a walking-stick. Go slow and use all available helps and aids—that is Oedipus’s wisdom. But Oedipus is not wise about ends. To become king of Thebes, he foregoes a greater and more necessary kingship over nature. Having bested the Sphinx, he makes no use of her. He knows how man crawls and walks and hobbles, but he does not know where man ought to go. So he fails to see that the greater ambition is the mastery that would keep man from being crippled and bent by age.

A more careful consideration of Augustus will show us that his art was similarly incomplete. It is in reading Pliny that Bacon comes to learn of Augustus’s misfortunes.¹³⁴ How much less would Augustus have suffered had he been master of a nature-mastering science? Perhaps he would not have fallen ill at the battle of Philippi. Perhaps he could have avoided shipwreck off the coast of Sicily. Had he better instruments of war, he may not have begged his friend to put him to death or been anxious of the outcome in Actium. Had he more advanced medical and agricultural arts, he, his troops, and his empire may not have suffered from pestilence and famine. If he had had the means of immortality, he would not have had to mourn the deaths of his own children or died leaving his own enemy’s son as his heir. He aspired to be and was called a god without truly overcoming mortality.

Now that we have traced out a constellation of figures—Hercules, Orpheus, Odysseus, Oedipus, and Cæsar Augustus—across a handful of myths, we can return to “Prometheus” and try to make sense of his rescue. Prometheus, we remember, signifies human nature, and human nature is the subject of Oedipus’s particular wisdom. And we remember that “Prometheus” teaches that

¹³³ *NO I* §104 (*OFB IV*, 163).

¹³⁴ *DSV* “Nemesis, or the Vicissitude of Things” (*SEH VI*, 738/662). His reference is to Pliny the Elder, *Naturalis Historia* VII, ch. 46.

man, in his first stages, is a naked and defenseless being full of wants. Painfully aware of his neediness, Promethean man tries to provide for himself by means of his productive arts. Though he vanquishes the Sphinx and becomes ruler of Thebes, Oedipus is not himself a practitioner of those productive arts, and nothing in Oedipus's story suggests that man's good comes through art. Oedipus settles instead for political rule. Like Prometheus, Oedipus suffers the agonies and anxieties mankind is born to. But unlike Prometheus, he tries to flee rather than master his fate. He eventually finds refuge and a measure of peace on holy ground. Prometheus—discoverer of fire and inventor of the arts, but ruler of no polis—sets himself against Zeus and refuses to be reconciled to his condition. He aspires to a kingdom greater than Oedipus's Thebes, one that sets him defiantly against the gods. Oedipus subdues science but makes no use of her. The torch races in honor of Prometheus allude to the arts and sciences and, Bacon says, carry “a very wise admonition.” We must have the patience and the fortitude to carry forward the long work of perfecting the sciences, for the salvation of mankind and his victory over fortune rests on their continual advancement. Such patience and fortitude look a lot like hope, not in divine or natural providence, but in one's self and in still-imperfect human art.¹³⁵

Orpheus lacked that fortitude, that patience, that hope perhaps, paradoxically, because he thinks too highly of man and trusts too much in the gods. Failing in his quest to defeat death and the infernal powers, he tries to tame mankind with his pious songs. He fails again because, being more divine and contemplative, he forgets his humanity: that man's nature is depraved, that man is ruled by desire, that man may sing the praises of the gods, but must also labor for his supper.¹³⁶ Because man is not a god, he can neglect his neediness and put off his desire only as long as

¹³⁵ Pandora's vase contains, beneath all its mischiefs and calamities, “Hope.” When Epimetheus realizes his mistake, he tries to close the lid. The only thing he manages to contain is hope. See *DSV* “Prometheus, or the State of Man” (*SEH* VI, 746/669-70). Bacon curiously does not offer an interpretation of this detail.

¹³⁶ *DSV* “Orpheus, or Philosophy” (*SEH* VI, 722/648).

Orpheus's song lasts. "Sphinx" shows us that Orpheus's errors are the errors of all divines and contemplatives.

Again Sphinx proposes to men a variety of hard questions and riddles which she received from the Muses. In these, while they remain with the Muses, there is probably no cruelty; for so long as the object of meditation and inquiry is merely to know, the understanding is not oppressed or straitened by it, but is free to wander and expatiate, and finds in the very uncertainty of conclusions and variety of choice a certain pleasure and delight; but when they pass from the Muses to Sphinx, that is from contemplation to practice, whereby there is necessity for present action, choice, and decision, then they begin to be painful and cruel; and unless they be solved and disposed of, they strangely torment and worry the mind, pulling it first this way and then that, and fairly tearing it to pieces.¹³⁷

Man, in this life, cannot escape the necessity for action and choice. Gods may look on; men must act. Ignorance goads not merely because we desire to know, but more urgently because ignorance makes action uncertain and perilous and so torments and worries us.

Cunning and artful Odysseus is a better model. Much stronger heroes died on the plains of Troy; his much weaker companions could not resist the various temptations they encountered on their journey home. But Odysseus, that man of many devices, contrives the horse that wins the war, returns home, and vanquishes the suitors who threaten his hearth and his rule. He saw many cities and learned men's minds; he learns from Hermes the nature of moly. That learning saves him from Circe's bewitchments, frees him from Polyphemus's cave, and allows him to sail between Charybdis and Scylla. And he knows how to listen to the Sirens without being destroyed by their song. Perhaps most important, he declines Calypso's offer of immortality. We must strive not for a godlike immortality, but whatever share of immortality is available to man as man. True greatness, after all, is to have both the frailty of man and the security of God.

¹³⁷ *DSV* "Sphinx, or Science" (*SEH* VI, 756-57/679). We remember that Orpheus, too, is torn to pieces. Cf. *DSV* "Orpheus, or Philosophy" (*SEH* VI, 721/647).

“Ah, happy, could we but the causes know / Of all that is! Then should we know no fears,” Virgil sings.¹³⁸ Hercules’s wisdom aspires to a knowledge of nature that puts death under foot, stands firm against Fate, and dispel all fears, yet Hercules’s fortitude and constancy does not finally depend on that natural knowledge. We do not, or do not yet, know the causes of all that is. Nor will we if we are too timid or too reconciled to pursue it. When Bacon offers us Virgil’s praise of natural knowledge, we ought not take it, as Virgil probably meant it, in Lucretius’s sense. We could be happy and free from fear if we know the causes of all that is, not because or not only because such knowledge allows us to stand above the fray and look down from our high, calm places on the wandering and strife of the ignorant who toil and contend for the entirety of their short lives to satisfy vain desires, but because such knowledge will lessen that toil and make the satisfaction of those desires more sure.¹³⁹ Hercules’s meditations on the inconstancy and fluctuations of human life are not like Epictetus’s, that man so “deeply seasoned with the consideration of mortalitie and corruptible nature of thinges,” that he thought the tears of the mother who wept for her dead son were as vain as the tears of the woman who wept for her broken pitcher.¹⁴⁰ We are wrong to think we are already gods who need not worry about all-too-human ignorance and strife and vain desires. The greatest and most summary benefit of learning, therefore, is not that it teaches us to look down on human things, but rather that “it disposeth the constitution of the minde, not to be fixed or settled in the defects thereof; but still to be capable, and susceptible of growth and reformation.”¹⁴¹ Useless is the knowledge that gives us a godlike view of vicissitudes without giving us the godlike power to reshape them. Until we have that godlike power, we must, like men, live by hope.

¹³⁸ *DSV* “Prometheus, or the State of Man” (*SEH* VI, 752/675). Bacon is quoting Virgil, *Georgics* II.490-92. He quotes the same passage at *AL* I (*OFB* IV, 50).

¹³⁹ Cf. Lucretius, *De Rerum Natura* II.

¹⁴⁰ *AL* I (*OFB* IV, 50).

¹⁴¹ *AL* I (*OFB* IV, 50).

4.2 The Roots of Good and Evil: Bacon's *Advancement of Learning*

In the guise of an ancient fable, “Prometheus” advances Bacon’s own understanding of human nature, man’s situation, and what best answers man’s situation. The conceit—that Bacon’s interpretation recovers a long-forgotten wisdom that is neither Christian nor Socratic—allows Bacon to avoid directly discussing how his views differ from Socratic and biblical views. We had to make a special effort to highlight some of the more important ways in which Bacon departs, in “Prometheus,” from the Christian origin story told in *Genesis*. The conceit also hides the source of Bacon’s wisdom about human things. To corroborate my interpretation, dig further into Bacon’s teaching about man, and uncover its sources, I now want to return to Bacon’s *Advancement of Learning* (1605). We have already carefully inspected Bacon’s division of the sciences in the *Advancement’s* second book. The first book, however, contains Bacon’s apology for learning. It is one of Bacon’s most developed and most public statements about the true end or ends of knowledge, and so also one of his most developed and most public statements about the human good.

In making his apology, he tells us (as we have seen) that “the greatest Error of all the rest, is the mistaking or misplacing of the last or furthest end of knowledge.”¹⁴² We have also seen, however, how hard it is to say just what Bacon thinks the last or furthest end of knowledge ought to be. To discover what that last or furthest end is, I will scrutinize, in addition to his apology, two sections of the second book, Bacon’s outline of moral philosophy and what I will call his *science of man*. In these sections, qualified agreement with the ancient philosophical teaching about human nature and the human good transforms into a radical critique.

That critique attempts to reverse the Socratic turn, to ground moral philosophy in natural philosophy. In short, if the ancients “had stayed a little longer vpon the Enquireye, concerning the

¹⁴² *ALI* (*OFB* IV, 31).

Rootes of Good and euill” and “consulted with Nature” instead of beginning with those “popular and receiued Nocions of vertue and vice, pleasure and payne, and the rest,” they would not have placed man’s good in contemplation and moral virtue.¹⁴³ Bacon had already rehearsed this argument against the Socratic turn in *Valerius Terminus* (c. 1603): “So if the moral philosophers that have spent such an infinite quantity of debate touching Good and the highest good, had cast their eye abroad upon nature and beheld the appetite that is in all things to receive and to give, . . . they would have saved and abridged much of their long and wandering discourses of pleasure, virtue, duty, and religion.”¹⁴⁴ In *Novum organum* (1620), Bacon explicitly blames Socrates for ending the only period in which natural philosophy flourished. Socrates “brought philosophy down from the heavens to the Earth,” popularized moral philosophy, and “turned men’s minds away from the natural.”¹⁴⁵ No less than astronomy, optics, medicine, and the mechanical arts, progress in “moral and political philosophy” depends on a reduction to natural philosophy.¹⁴⁶

If Bacon recognized early the need to put moral philosophy on a more solid, more natural footing, he hesitated, in his more mature writings, to name or enumerate nature’s universal appetites. In *Novum organum*, Bacon begins not with the roots and strings, but, as his method prescribes, with a natural history of moral phenomena. He announces that he is compiling a “history and tables of discovery concerning anger, fear, shame, and so on, and also ones to do with examples of civil business.”¹⁴⁷ The idea seems to be that his new method, applied to morals and politics, could yield surer and more useful moral knowledge than all the ancient philosophers’ long and wandering discourses. But much earlier, in *Valerius Terminus*, he had already identified, without the help of his method, the basic and universal categories of appetite. The “aptest and most natural division of all

¹⁴³ *AL* II (OFB IV, 136).

¹⁴⁴ *VT* ch. 8 (*SEH* III, 229).

¹⁴⁵ *NO* I §79 (OFB XI, 125).

¹⁴⁶ *NO* I §80 (OFB XI, 127).

¹⁴⁷ *NO* I §127 (OFB XI, 191).

the desires” is between man’s active desire for multiplication, generation and the sense of power, on the one hand, and on the other, the passive desire for preservation, nourishment, and the sense of pleasure.¹⁴⁸ Any high-flown talk about the *summum bonum*, the Good itself, virtue, duty, and happiness will be airy speculation unless it can be built up from or reduced back to these primary desires or appetites.

Bacon’s project to naturalize moral science therefore has two parts, but not those parts that we have been led to expect. Other interpreters have divided Bacon’s moral teaching into a “provisional” and a “definitive” teaching.¹⁴⁹ The definitive moral science must wait for a considerable development of natural philosophy and a methodically certified knowledge of the good. Compared to the definitive moral science, these universal appetites seem merely “provisional” or, worse, the very sort of anticipations that Bacon accuses the ancients of indulging. It would be better, though, to characterize them as *methodological* first principles: not the kind of anticipations Bacon accuses the ancients of, but the kind of anticipations I have argued ground his method generally. Since nothing more definitive can supplant them, these anticipations cannot be merely provisional. Following the method, Bacon aims to discover the kind of intermediate axioms that will give man power to reshape human action.¹⁵⁰ But he unearths the roots and strings, the universal and basic appetites of all bodies, *dialectically*.¹⁵¹

¹⁴⁸ VT ch. 8 (*SEH* III, 229-30). Bacon fills out the “quaternion of good” by adding to this primary division the good of “consenting or proportion,” which concerns the congruity of part and whole, and the good of “approach or assumption,” which seems to be a kind of striving toward perfection within a being’s own kind.

¹⁴⁹ See especially Howard White, *Peace Among the Willows*.

¹⁵⁰ *EJ* “Of Anger” (*OFB* XV, 170-71) may offer an example of low-level axioms or natural-historical observations that could form the basis of such axioms.

¹⁵¹ Here is the pivotal point of contention between my and Svetozar Minkov’s analyses. “According to Bacon,” Minkov says, “the ancients did not start from the common and received opinions, but came to them based on an already-held theoretical understanding” and that Bacon, on the contrary, “wants to account for the common and received opinions before proceeding further.” He assures us that “Bacon’s own exposition here of what moves human beings and of the various elements of the human good is to be distinguished from a modern natural-scientific account of the human good.” See Francis Bacon’s *“Inquiry Touching Human Nature”: Virtue, Philosophy, and the Relief of Man’s Estate*, 29. Cf. Howard White, *Peace Among the Willows*, 26-27 and 198. Minkov underestimates Bacon’s critique of the ancient

That dialectic draws together Socratic moral philosophy and Christian moral law in unexpected ways. *Valerius Terminus* had treated the universal appetites in passing, as an example of how one particular science can inform another. About two years later, in the *Advancement of Learning*, Bacon again takes up these universal appetites, this time in a more carefully and fully developed thematic discussion of moral philosophy. He again distinguishes (still without the benefit of his new method) between an active and a passive appetite, but he now goes on to divide the passive appetite into a desire for preservation and a desire for perfection.¹⁵² More significantly, Bacon now ranks the primitive appetites. The passive desire for perfection is higher than the passive desire for preservation, and the active desire for power and multiplication is more worthy than both passive desires. The *Advancement* also makes clear that, despite their different objects, modes, and relative worths, these three desires are all instances of self-love.¹⁵³ Man, however, is not moved by self-love alone. “There is fourmed in euery thing a double Nature of Good,” Bacon confidently asserts, “the one as euery thing is, a Totall or substantiue in it selfe; the other, as it is a parte or Member of a greater Bodye.”¹⁵⁴ Insofar as we are individual selves, we are concerned with our own, private good. Insofar as we belong to a greater community, we are concerned with that greater and more public communicative good. This newly introduced division between the private and the public good threatens to eclipse or at least complicate the active-passive dichotomy that seemed to define man’s moral landscape, and once Bacon identifies the public good with Christian charity, the chief moral controversy seems to pit public-spirited Christianity against private and retiring contemplative philosophy.

philosophers and misses the very different sense—a sense I have labored to uncover in this thesis—in which Bacon’s own thought is dialectical.

¹⁵² Bacon also includes in his catalog, in *VT*, a “good of approach or assumption” that probably answers to this appetite for perfection. See note 148, above.

¹⁵³ *AL* II (*OFB* IV, 140).

¹⁵⁴ *AL* II (*OFB* IV, 136).

It is by no means obvious, however, that Christianity is especially public spirited, that ancient philosophy is especially unconcerned with the common or public good, or that the issue between Christianity and ancient philosophy is best characterized in terms of public versus private goods. Indeed, Christianity sanctioned a life devoted to private moral virtue and personal faith, and Socrates led a private life in service, he says, of the greatest public good. Why, then, does Bacon instigate a rivalry between Christianity and Socratic philosophy by framing the debate in this way?

A look at the *Essays* further complicates matters. In “Of Goodnesse And Goodnesse of Nature,” Bacon collapses Christian moral teaching and Greek moral philosophy. Men have “imprinted deeply” in their nature an inclination to promote the welfare of their fellow men. The Greeks call it “*Philanthropia*,” and it “answers to the *Theologicall Vertue Charitie*.”¹⁵⁵ The problem here is not, as it is in the *Advancement*, a competition between public and private goods. While *philanthropia* or charity “admits no Excess,” it is prone to “Errour,” errors that can be cured if we will but heed “one of the Doctors of *Italy*, *Nicholas Macciavel*.” On his own authority, Bacon warns us to “beware, how in making the Portraiture, though breakest the Patterne: For Divinitie maketh the Love of our Selves the Patterne; The Love of our Neighbours but the Portraiture.”¹⁵⁶ The self-love that is subordinated to man’s “infinite feeling of *Communion*” in the *Advancement* becomes, in the *Essays*, the model and limit of our love for others. Man’s love of God is nowhere mentioned.

In one case, Bacon sets Christianity and Socratic philosophy at odds. In the other case, he makes pagan Greeks and Christians speak in one voice. By opposite means, Bacon attempts the same end. He wants, in short, to use Christianity to undercut the Socratic contemplative ideal, to turn philosophical contemplation against Christianity, and ultimately to use Machiavelli’s serpentine

¹⁵⁵ *Essays* “Of Goodnesse And Goodnesse of Nature” (OFB XV, 38-39).

¹⁵⁶ *Essays* “Of Goodnesse And Goodnesse of Nature” (OFB XV, 38-39).

wisdom to reign in the transcendences of each and teach us to mind what Socrates derisively called “the business of human beings.”¹⁵⁷

Bacon’s new moral science is neither Socratic nor Christian nor, finally, Machiavellian. Nevertheless, it is Socratic moral philosophy, Christian moral law, and Machiavellian policy that shape, if only negatively, Bacon’s natural-moral science. This is, in its way, the reconciliation between philosophical wisdom, Christian revelation, and practical, political wisdom implicitly promised in Bacon’s description of King James I in the letter of dedication that opens the *Advancement*. James unites in his own person these three wisdoms. He “standeth inuested of that triplicitie, which in great veneration, was ascribed to the ancient *Hermes*; the power and fortune of a King; the knowledge and illumination of a Priest; and the learning and vniversalitie of a Philosopher.”¹⁵⁸ Bacon scatters enough clues to cast doubt on the sincerity of his esteem for James without calling into question the goal of reconciling reason, faith, and policy. The *Advancement* itself appears to be a Christian and politically-spirited defense of science. Bacon begins that defense by answering the objections of representatives of those three wisdoms: zealous divines, men of practical affairs, and the learned themselves. These three separate apologies are unified by a new teaching about charity and a new task for science. A new form of contemplation, governed by charity and ordered to action, will give us the power to relieve man’s miserable condition and create a new paradise.

This synthesis radically transforms each element. So transformed, politics now strives neither for virtue nor empire nor the glory of God, but the more mundane provision of its citizen’s daily bread. Contemplation can no longer afford to be private and retiring or allowed to shirk its responsibility for the public good. The new teaching regarding charity commands good Christians to

¹⁵⁷ Plato, *Republic* VII, 517c-e.

¹⁵⁸ *AL I* (OFB IV, 5).

love their neighbors (but not more than they love themselves) and omits the greater command to love the Lord thy God with all thy heart, with all thy soul, with all thy mind, and with all thy strength.¹⁵⁹ Charity must become more worldly; the desire to know must become a desire to master; friendship, patriotism, and love of God give way to a new universal humanitarianism. All in all, we are to set our hope on the Kingdom of Man rather than the Kingdom of God, a world made by man for man's own good.

My task, then, is to show how Bacon's teaching about the natural roots of good and evil emerges from his critical transformation, with Machiavelli's help, of the Socratic and Christian traditions and to understand how his critique issues in a new teaching about charity and a new goal of charitably mastering nature. This was Kennington's question: how did the new goal of universal mastery arise out of biblical religion and classical Greek philosophy?¹⁶⁰

I have broken the task into five parts. I will begin by presenting, from Bacon's perspective, Socrates's apology for philosophy (4.2.1). In the next two sections (4.2.2 and 4.2.3), I will show how Bacon turns Socrates's apology against itself. Socrates's failure to persuade his fellow citizens of philosophy's service to the city points to fundamental problems in the Socratic view of reason, the appetites, and the relation between the two. Bacon's new science of man shows how philosophy and the city can be reconciled by recasting the relation between reason and appetite. His account of moral philosophy—which is, at bottom, a critique of the pusillanimity of ancient philosophical contemplation—points to a new teaching about the human good and a new ideal, a great-souled man whose self-love and desire for mastery can be channeled in more charitable and benevolent directions. That critique of ancient philosophical contemplation seems to be based on Christian moral teaching, but in the next section (4.2.4), I will show how Bacon's critique of Socratic

¹⁵⁹ See *Matthew* 22:37-40 and *Mark* 12:29-31.

¹⁶⁰ Richard Kennington, "Bacon's Reform of Nature," 3.

contemplation doubles as a critique of Christian moral law by looking at Bacon's odd, anachronistic claims about Adam and Abel—the original contemplatives, on Bacon's telling—in his response, in *Advancement I*, to the religious arguments against learning. For all their differences, the Christian and Socratic teachings about man founder because of a similar misunderstanding of human nature and the human good. In this chapter's final section (4.2.5), I will discuss Bacon's worldly transformation of charity. Stripped of its transcendent object, charity tames man's otherwise terrible desire for mastery, forcing him to become a more benevolent god.

4.2.1 Socrates's Misunderstanding of Man

Bacon's apology for learning recalls Socrates's more famous apology, and Socrates's defense of philosophy is the right frame of reference for Bacon's own. His new apology is necessary both because his new science requires a new defense and because Socrates's old apology was inadequate. Misunderstanding man, Socrates misunderstood philosophy and the human good it can achieve. By turning Socrates's apology against Socratic philosophy, Bacon shows us what man really is and how philosophy can be made to serve real human goods.

Meletus, Anytus, and Lycon—on behalf, respectively, of the poets, the craftsmen and politicians, and the orators—accuse Socrates of corrupting the Athenian youth and promoting novel beliefs about divine matters. He is compelled to defend his philosophizing before an Athenian jury. But as Socrates makes clear, the real charges against him concern his peculiar way of life. He scorns the things most people care about—wealth and honor and reputation—and has little regard for what most people most of the time take to be real human interests. He is insensible, it seems, to most pleasures and pains. We see him unshod and impervious to the cold, poor but wanting for nothing

save wisdom. He talks and drinks through the night with friends and walks home sober as the sun rises. “The wholly amazing thing,” Alcibiades taunts, “is that there is nothing like him among human beings, neither among the ancients nor among those now.”¹⁶¹ Socrates’s neglect of what occupies most people makes him seem superior and inhuman. “That I am the kind of person to be a gift of the god to the city you might realize from the fact that it does not seem like human nature for me to have neglected all my own affairs and to have tolerated this neglect now for so many years,” Socrates says.¹⁶² Indeed, as Bacon argues in “Prometheus,” man’s nature compels him to be providently concerned with his own welfare. Socrates, then, is a kind of anti-Prometheus.

Even stranger, Socrates does not share his fellow citizens’ fear of death. Since for all we know it may be the greatest blessing, we ought not shrink from death as if we knew it to the greatest evil. The fear of death often makes men shameless and unjust, but life is not worth having if it can only be had ignominiously. Indifferent to death, Socrates need not bow to the Thirty’s threats or weep to arouse the jury’s pity. The dreamless sleep of death would in fact be a great blessing, Socrates argues. “For I think that if one had to pick out that night during which a man slept soundly and did not dream, put beside it the other nights and days of his life, and then see how many days and nights had been better and more pleasant than that night, not only a private person but a great king would find them easy to count compared with the other days and nights.”¹⁶³ This argument is hard to reconcile with his next, that death is to be eagerly sought if it brings an eternal life in the company of Orpheus, Musaeus, Hesiod, and Homer and the chance to examine Agamemnon, Odysseus, and Sisyphus. What the two arguments share is a conviction that whatever death has in store for us—oblivion or the company of great men—will be better than the best that this life can

¹⁶¹ Plato, *Symposium*, 221c.

¹⁶² Plato, *Apology*, 31a-b.

¹⁶³ *Apology*, 40d-e.

offer. Anything, it seems, would be preferable to life among the Meletuses and Anytuses of the world. Even the wisest and strongest city in the world is no fit home for a true philosopher. Philosophy done right, therefore, is a preparation for death.¹⁶⁴

Most men can look cheerfully on their own death and abandon their providential care only by entrusting themselves to a greater providence. Socrates sometimes talks as if he, too, has entrusted himself to the gods' provident care. He has a daemon who warns him when he is about to do something wrong.¹⁶⁵ He believes that he is the gods' gift—perhaps their greatest gift—to the Athenians.¹⁶⁶ He says, as the dialogue closes, that a good man's "affairs are not neglected by the gods."¹⁶⁷ But more firm than these opinions about the gods is Socrates's conviction that "a good man cannot be harmed either in life or in death," that "Neither Meletus nor Anytus can harm me in any way . . . for I do not think it is permitted that a better man be harmed by a worse."¹⁶⁸ Death or banishment are nothing compared to the harm that one inflicts on himself by acting unjustly. This opinion about man's good does not depend on provident gods or an after-life that rewards the just and punishes the wicked. Even if death were like a dreamless sleep, Socrates's strange way of life would still be justified.

Socrates's eccentric views may be harmless so long as they remain private. His public service, however, tries to make the city philosophical. Socrates can live and act resolutely without the assurance that comes from settled beliefs. Such radical openness is impossible for a community, for it cannot survive without some shared and unquestioned beliefs. Socrates is a living rebuke to a city that depends on wide and uncritical acceptance of its founding myths. His radical questioning is an existential threat to the political community that admits it. There just is no mechanism for Socrates's

¹⁶⁴ See Plato, *Phaedo* 67e and 61b-c.

¹⁶⁵ See *Apology*, 40a-b.

¹⁶⁶ See *Apology*, 30e-31a and 36c.

¹⁶⁷ *Apology*, 41d.

¹⁶⁸ *Apology*, 41d and 30c-d.

sort of inquiry on the city's scale. Discussing virtue every day may be the greatest good for a private man, but the Assembly cannot renegotiate each morning the city's most basic convictions.

More fundamentally, philosophy calls into question the very good men seek in political community. According to Aristotle, cities come into being in order to satisfy man's basic needs and continue to exist in order to satisfy man's higher needs.¹⁶⁹ In the *Republic*, Plato's Socrates proposes that, in order to more easily find justice, he and his interlocutors create a city in speech. Like a real city, that ideal city comes into being "because each of us isn't self-sufficient but is in need of much."¹⁷⁰ Insufficient to themselves and needing food, shelter, and clothing, men band together, each supplying some part of the common need. The farmer, the housebuilder, the weaver, and perhaps also the shoemaker together constitute the "city of utmost necessity."¹⁷¹ The city is composed of various productive arts, none sufficient by itself to meet man's needs but together approaching self-sufficiency. How many arts together make a city self-sufficient? Socrates's imprecision—the city of utmost necessity will require four *or* five citizens—and his indecision about the necessity of the shoemaker's art signal the difficulty Glaucon, Adeimantus, and he will have in distinguishing between true needs and extraneous luxuries. If the farmer's and the housebuilder's work is to be fine, they will need carpenters and smiths and many other craftsmen as well as cowherds and shepherds and many other kinds of herdsmen to become their partners in the growing city. Even this city grown large will import some of what it needs, and so too there must be merchants and traders. With the addition of wage-earning laborers, the city seems complete. The citizens would produce according to their need and enjoy together the fruits of their labors free from poverty and war. Glaucon objects. Where are the relishes, he asks? The country pleasures

¹⁶⁹ Aristotle, *Politics* I.1.

¹⁷⁰ *Republic* II, 369b.

¹⁷¹ *Republic* II, 369d.

Socrates reluctantly permits—salt, olives, cheese, boiled onions, and figs—suffice only for a city of sows, Glaucon complains. Men will want to recline on couches and eat at tables. Because its needs have grown, so too must the city. Its growth will eventually require the city to go to war, the causes of which are “those things whose presence in cities most of all produces evils both public and private.”¹⁷² Which things? Socrates’s answer is vague, perhaps deliberately. It may prove impossible to identify that point at which the city should have stopped growing, when true needs turned into ruinous luxuries. Or maybe Socrates had identified the point when the healthy city turned feverish, but the healthy city fails to please even the good- and justice-loving Glaucon. As we learned from Socrates’s apology, to turn one’s back on pleasures, wealth and honors seems almost inhuman. Perhaps Glaucon is right: the healthy city may be fit only for pigs.

Bound together as a city, the arts pursue a seemingly boundless progress. Hydra-like, for every need the arts satisfy, mankind feels the pinch of two new needs. The arts create more needs than they satisfy, and the more progress they make, the further away the arts are from their ultimate goal of self-sufficiency. Moreover, the arts themselves are responsible for the very ills we try to artfully remedy. The art of medicine, Socrates suggests, is necessary only once the progress of culinary arts refine men’s tastes. Philosophy as Socrates practices it has no place in the healthy city. Only in an Athens grown feverish is there need for a gadfly to remind men to care for virtue above wealth, pleasure, and reputation. This is Socrates’s great service to the city: philosophy moderates the arts’ ambitions. The city’s artful pursuit of self-sufficiency must be tempered by virtue. So Socrates sets virtue against art, philosophy against the city.

Thus artless philosophy is the salutary brake to art’s progress and the growth of human desire. Socrates’s human wisdom and the more-than-human wisdom he determinedly seeks are not

¹⁷² *Republic* II, 373e.

art-like. We learn this from Socrates's critique of the craftsmen in his apology: in knowing his art a craftsman knows a very fine thing, but he easily confuses the knowledge of his art with a non-technical wisdom about the human good.¹⁷³ We can learn it again from the *Meno*. Virtue seems to be knowledge but also seems not to be knowledge because there are no teachers of virtue. Why should we think that knowledge should be teachable? Because of the example of the arts. If we want to learn how to play the flute, we go to an expert flutist. If we want to learn to ride a horse, we go to an expert rider. Socrates and Anytus actually agree that, despite what some sophists claim, there is no art-like expertise in virtue.

Since virtue is not art-like expertise, Socrates induces Meno to conclude that virtue must spring from god-given right opinion. Perhaps Socrates would have escaped Meletus's and Anytus's accusations had he left it at that. Virtue enjoined by the gods may be a necessary corrective to the city's artistic ambitions, the illicit desires the arts inflame, and injustices those desires drive men to commit. To be reminded that your city's good depends on the gods' favor may be a helpful counterweight to the city's inborn striving for self-sufficiency. But even if Socrates does not teach atheism or belief in new spiritual things, he is not content to depend on right opinion or wait on the gods to chastise Athens' crimes and reign in its excesses.¹⁷⁴ The greatest good for a man is to wake every morning and resume the search for that wisdom—tied down, as art-like knowledge is, but not itself art-like—that can take the place of god-given right opinion. The arts may make us comfortable and the Olympic victors may make us think we are happy, but only a life of philosophy will make us actually happy.¹⁷⁵ We cannot live outside the city, but neither should we give ourselves over to those goods the city can provide.

¹⁷³ See *Apology* 22d-e

¹⁷⁴ Or Socrates is the gods' gift sent to chastise Athens.

¹⁷⁵ See *Apology* 36d-e.

Bacon agrees with Socrates about the object of the city's eros, its means of getting what it wants, and the dangers it hazards in its pursuit. "Prometheus" shows us that man's nature is to strive for self-sufficiency through the arts, that those arts arouse desires that make us evermore dependent on the arts, that our artful providence both satisfies our human neediness and torments us with gnawing anxieties, that our artful pursuit of self-sufficiency sets us against the gods and excuses even the greatest crimes. While their diagnoses agree, their prescriptions are radically different. More needful than anything, according to Socrates, is a philosophy that can hold accountable the productive arts and moderate the human desires from which they grow. More needful than anything, according to Bacon, is a philosophy that can ground and nourish the productive arts to ensure their continuous progress and the ever-greater satisfaction of man's desires. If we want to trace that disagreement to its source, we must look beyond their shared premises. To find the real point of contention, I suggest we consider why Socrates's apology fails and why Bacon believes that his apology will not.

My claim that Socrates's apology fails will be controversial to some. He is put to death, they will say, but inspired by Socrates's example philosophy lives and thrives. What they say is true. But let us focus on the ways in which even Socrates predicts that his apology will fail. Socrates knows what he must do to win his acquittal or at least to escape punishment. He could promise to give up his impertinent questioning and live a quiet life. He could parade his family through the court room, beg for mercy, and generally make himself pitiable. He will not because it is unjust and unbecoming to submit to opinions or appeal to the passions rather than principles and reasons. Man is rational and should live by reason. He would do himself and the city no good by abandoning reason now.¹⁷⁶

¹⁷⁶ In the hours before his death, Socrates likewise counsels his friends not to succumb to misology, for there is no greater evil one can suffer than to hate reasonable discourse. Socrates will not mourn his own death, but he shall cut his hair in grief if their argument dies and cannot be revived. See *Phaedo* 88c-90d.

But Socrates also knows that his attempt to rationally persuade the jury will fail. Expecting to be convicted, he is surprised only by the vote's narrow margin. The problem on his telling is the Athenian law. The trial lasts only a day and does not permit him to engage the jury and his accusers as he is wont. Yet as he says many times, he is an old man who has long and faithfully served the city. He has been at his gadfly work long and publicly enough to get a reputation. If he only now sees the need to offer some account of himself and some apology for his way of life, the laws which appoint the length and procedure of such a trial are hardly to blame.

Of course Socrates has all along been engaged, in both word and deed, in an unsuccessful defense of the philosophical life. Put another way, he fails to persuade the jury on the day of his trial because he has often failed to persuade those he questioned and those who heard him conversing at leisure and at length. Despite his protests, he is not wanting as a speaker or lacking in persuasive power. Indeed, he points to more than a few men who have become devoted followers and hangers-on. Some no doubt keep his company only because it delights them to see proud and important men humiliated by Socrates's questioning. Others, however, have surely been won to Socrates's cause and converted to a life of philosophy. Those conversions prove that Socrates can persuade when persuasion is possible.

The trouble is, most men cannot be persuaded. Socrates himself acknowledges that rational persuasion can never sway a crowd set against it. That is why an upright man must stay out of politics. "There isn't anyone in the world who'll survive," Socrates tells the jury, "if he genuinely opposes you or any other popular majority and tries to prevent widespread injustice and lawlessness from occurring in the city."¹⁷⁷ Athens is not especially unaccommodating. Socrates knows well enough that he would be no more welcome in another city. Nor is it enough to stay out of politics.

¹⁷⁷ *Apology*, 31e.

Socrates's private attempts at persuasion have set the city's most powerful forces against him, and those forces will not yield to persuasion. Socrates had more roundly confessed philosophy's impotence in the *Republic*. The city would know justice only if philosophers were to rule or the rulers were to philosophize, but the coincidence of wisdom and power is extremely unlikely and probably unstable. Wisdom looks ridiculous to the unwise, just as Socrates's way of life must look ridiculous to an ordinary Athenian.

Understood as a teaching about the polity of the soul, the *Republic* proposes a darker teaching. The political problem of wisely governing men ruled by irrational desires becomes the psychic problem of reason's rule over the appetites. To solve that problem, Socrates proposes a mediating element, a passion that will listen to reason. *Thumos* is a friend of reason without itself being rational. Aristotle, too, divided the irrational soul into parts, one of which was capable of some share of reason.¹⁷⁸ Reason rules the desires and appetites by a kind of persuasion, by urging and exhorting. The irrational soul participates in reason by being obedient and amenable to reason's persuasions. We know well enough that the appetites and desires are not fully rational, that they are in fact opposed to reason because reason often proves unpersuasive. Even the self-restrained man feels the pull between what he wants and what he knows to be good. This part-wise anatomy of the soul seems both unavoidable and inadequate. Our lived experience suggests that, psychologically speaking, we are not a simple unity. But to explain the interaction between these parts, we attribute to the irrational part some quasi-rational ability to respond to reasons and to the rational part some desire that is properly its own. We make the story go by blurring the distinction between reason and irrational appetite.

¹⁷⁸ See Aristotle, *Nicomachean Ethics* I.13.

We might doubt this story about the polity within the soul for the same reason that Thrasymachus doubted that a city's factions are held together through rational persuasion. As Thrasymachus worried, it may not be so easy to distinguish in practice between persuasion and force; justice may be nothing more than the rule of the stronger. Even in the ideal city-in-speech, justice is conditioned on a noble lie and the slaughter or expulsion of most adult citizens. The perfect rule of reason is achieved by deceit and force rather than persuasion. The perfect rule of reason that marks a virtuous man is likewise achieved through a kind of force. A man is virtuous when his desires have been moderated and made obedient through habituation to rational principle. Habituation, however, is a repeated, constraining violence, not rational persuasion. Bacon approvingly repeats Aristotle's suggestion that habits, like crooked sticks, can be straightened by bending desire toward the contrary extreme.¹⁷⁹ In both the soul and the city, reason comes to rule only by overpowering the appetites. Like any of the competing appetites, reason wins out only if it is strongest.

Even Socrates and Aristotle would concede that reason does not rule most men. Thrust into the tumult of appetites, reason rarely proves the strongest. Its victories are almost always partial and temporary. The rule of reason in the city is even less likely. The coincidence of power and wisdom is a matter of chance, and the chances are slim. To put one's hopes in the coincidence of power and wisdom is to concede that wisdom is not itself powerful. So while Socrates argues that Athens depends on his philosophizing, he also knows that he is at the city's mercy and that his efforts to persuade will probably not succeed. The love of virtue is rarely as strong as the fear of death and pain. All men may desire to know, but only a few desire knowledge more than the advancement or profit that come through knowledge. Because it cannot rule over the appetites, reason must appeal

¹⁷⁹ See *AL* II (*OFB* IV, 152) and *Essays* "Of Nature in Men" (*OFB* XV, 119). Cf. Aristotle, *Nicomachean Ethics* II.9.

to them. Reason is never as secure as it is when gratifying those mastering desires. Socrates's fate is the fate of intransigent reason, of reason that will not stoop to serve the passions.

While man's good depends on the rule of reason, reason's own desire is neither to rule nor to serve, but to spend itself in blissful contemplation. The true philosopher must be compelled or persuaded to leave behind those "acts of divine contemplation" in order to "mind the business of human beings."¹⁸⁰ A life of contemplation, Aristotle concedes, would be too high for a man. Still we ought not listen to those who "advise us, being men, to think of human things, and being mortal, of mortal things, but must so far as we can, make ourselves immortal, and strain every nerve to live in accordance with the best thing in us."¹⁸¹ Sophocles has a chorus counsel that the best for man is not to be born; second best to die soon.¹⁸² The Socratic advice at bottom is not so different. The best for a human being is not to be a human being. We ought, so far as we can, cast off our composite nature. The practice of philosophy helps us separate our soul from its attachment to the body, a separation that perhaps only a properly prepared death can complete. If the soul itself is composite, we must slough off its less rational parts, too. Unencumbered by merely human business, we can then uninterruptedly contemplate the Good Itself or become perpetually self-thinking thought.

Take this, then, as a summary of the Socratic account of reason's true greatness and pathetic weakness. There is a real if sometimes hidden tension between man the rational animal and man the political animal, between the philosopher's theoretical eros and the creaturely necessity that drives man into political community. That tension becomes visible in Socrates's trial and in Aristotle's inability to adequately resolve the claims of contemplation and moral virtue. It is internalized in reason's impossibly doubled role—theoretical and practical, contemplative and ruling. Reason may

¹⁸⁰ *Republic* VII, 517c-e.

¹⁸¹ Aristotle, *Nicomachean Ethics* X.7.

¹⁸² Sophocles, *Oedipus at Colonus*.

be what is most divine and worthiest in man, but as Aristotle said, it is the smallest part and can be exercised only intermittently. Reason does not wish to rule but must nevertheless impotently try. Our souls are, as Socrates feared, monstrosly composed of incompatible parts.¹⁸³ Since those parts cannot be harmonized, we must strive to constrain and cripple the appetites enough to subject them to reason's rule. Man's desires, however, cannot be kept in bonds. His neediness compels him to provide for those deficiencies in his composite nature, but the artful satisfaction of those needs inevitably leads to new and more powerful desires. In this life, reason is tragically fated to ignorance and to be the slave of appetites. The best man can hope for is to be born with weak appetites into a well-governed city that encourages virtue and allows for leisurely contemplation. Even that best case is precarious, though, since the city that today strives for virtue will tomorrow turn decadent, and no gadfly's bite stings enough to unbend fortune's wheel.

4.2.2 Bacon's *Science of Man*

Bacon's critique—the subject of this and the next two sections—is in one sense only a recapitulation of the Socratic teaching about the limits of reason stripped of the glorification of reason's godlike contemplation. The Socratic teaching about the human good relies on a stable but confused distinction between godlike reason and all-too-human appetite. Man's highest aspiration is godlike rational contemplation made possible by reason's rule over the appetites. To become like a god, the ancients teach, he must become less like a man. Bacon's wager is that if we recast reason's role, blur the distinction between reason and appetite, and so give appetites their proper place, we can become gods without ceasing to be men. He goes farther than the Socratics in showing that

¹⁸³ See Plato, *Republic* X, 611c-612a.

reason is not only impotent to master irrational appetite, but that reason's own activity is distorted by the will's imperatives. The Idols of the Mind are, at bottom, those ways in which the mind's apprehension of reality is colored by desire. The mind is an uneven mirror because it mingles its own nature with the nature of things, but the mind's own nature is nothing other than those more primitive desires that become the measure of reality.¹⁸⁴ Ordinary reason is just the mind's clumsy way of mastering reality, of forcefully ordering it according to man's own needs. So, too, is the philosopher's contemplative reason, though it seems to him a purer interest in knowledge for its own sake. A chief function of method, therefore, is to constrain the mind's insatiable desire to know.¹⁸⁵

I am only repeating what we already learned in our reading of "Prometheus," that true greatness combines the frailty of man with the security of a god. In the *Advancement*, however, we can watch this conclusion unfold through a critique of the ancient teaching about human nature and the human good. The ancient teaching about the human good depends on the ancient teaching about human nature. Man's good is determined by the kind of being he is. Man is the political animal, and so his good consists in living in community with others. Man is the rational animal, and so his good consists in the activity of reason. Reason is man's specific difference. Reason, therefore, cannot be explained by what is common to all animals. Reason must be a power of a separate or separable mind or soul, and probable arguments suggest that this separable mind or soul can exist without its animal parts and may be immortal. Bacon agrees with the ancients this far, that the human good is determined by the kind of being man is. But in mistaking man's nature, Bacon argues, the ancients mistook his good. That is the argument I will now try to lay out.

¹⁸⁴ See NO I §§41, 45, and 49 (OFB XI, 79-81, 83, and 85).

¹⁸⁵ See NO I §48 (OFB XI, 85-87).

To bring this argument to light, I will first turn to Bacon's science of man, that is, to his teaching about man's constitution.¹⁸⁶ Briefly, the *Advancement* corroborates the teaching in "Prometheus" that man is the most composite of beings. Those parts are not, however, body and soul, and the soul (or whatever the term *soul* ultimately signifies) is not itself composed of reason and appetite. What we call *reason* and *appetite* are more alike than we usually suppose, or reason itself is really only a species of appetite. Therefore a man is not a body informed by a rational soul; he is a bundle of competing appetites. "Rational" appetites are preferable to "irrational" appetites not because they are more noble, more human, or more divine; they are preferable because they are more provident, aiming at power and mastery rather than immediate pleasure.

The place to look is Bacon's review of human philosophy, man's rational investigation of man himself.¹⁸⁷ Bacon's novel divisions of human philosophy suggest a new way to anatomize man. He first divides the science of man into the knowledge of man as he is by himself and the knowledge of man in society.¹⁸⁸ To know man, we must see him not as he is in the company of other men, but in his ownmost constitution. This first division is a decisive step in the transformation of the political animal into an individual *self*.

Next, the self can be divided into body and mind or soul (Bacon repeatedly uses this evasive disjunction), and a separate science comprehends each.¹⁸⁹ That man's body can be known separately from man's soul means that soul or mind is not the form of body. The two exercise a mutual influence and are related, but not as form is to matter.

¹⁸⁶ The only account of man's origins discussed in *Advancement* is the bible's. While other natural beings are best understood through their genesis, a rational account of man's genesis does not seem to be available.

¹⁸⁷ His review of human philosophy occupies well over half of the second book—*AL II* (*OFB IV*, 93-181)—though here I am chiefly interested in his accounts of the man's constitution—his body, his mind, and the faculties of the mind.

¹⁸⁸ *AL II* (*OFB IV*, 93).

¹⁸⁹ *AL II* (*OFB IV*, 93).

The science of soul or mind has two principal parts, a science of the substance or nature of the mind and the science that inquires into the soul's or the mind's faculties or functions. For knowledge of the substance or nature of the soul or mind—how far, for example, the soul is exempted from the laws of matter or whether the soul is immortal—we must defer to religious authority. Bacon offers a slippery rationale: man's soul was not produced, as was the rest of creation, out of the original mass of heaven and earth, but through immediate inspiration. Since the soul is not bound by the laws of nature “otherwise than by accident,” its nature cannot be a subject of philosophy, which is competent only regarding nature's laws. Yet Bacon also says that the knowledge of the soul's or the mind's nature and substance “may be more really and soundly enquired euen in Nature, than it hath been,” and he had earlier devoted a whole science to the sympathies and correspondences between the body and mind or soul.¹⁹⁰ This “inquirie TOVCHING HVMANE NATURE ENTYER” studies the ways in which body and soul disclose and move one another.¹⁹¹ The possibility of such a science shows that men's souls or minds are bound, at least in part, by the same laws that govern men's bodies, and not only accidentally. What is more, Bacon undercuts the idea that we can have an inspired knowledge of the soul.¹⁹²

The nature and substance of the mind, insofar as it can be rationally known, is better handled through a discussion of the mind's powers. Bacon first lists only two faculties, (1) reason or understanding and (2) will, appetite, and affection. To these two he quickly adds a third, Janus-like imagination. Imagination is key. It is a sort of go-between or emissary and the medium through

¹⁹⁰ *AL II (OFB IV, 103)*.

¹⁹¹ *AL II (OFB IV, 96)*.

¹⁹² There are three kinds of divination—natural, artificial-rational, and artificial-experimental. The last is, for the most part, superstitious; the second is just the scientific discernment of natural causes and so properly treated in the separate sciences. But Bacon is careful not to reassign or pass judgment on natural divination. Natural divination, both “primitive” and “by influxion,” occurs when the mind withdraws into itself and is “grounded on the supposition” or “grounded vpon the conceit” that the mind so collected becomes a more reliable and more sensitive mirror, capable of reflecting some natural “prenotion” or being lit up by divine illumination. Yet as Bacon says only a few pages later, the mind is “like an enchanted glasse.” Cf. *AL II (OFB IV, 104-05)* with *AL II (OFB IV, 116)* and *DAS V.4 (SEH IV, 431)*.

which reason and will affect each other. Imagination presents the will's appetites to reason in the form of truth and reason's decrees to the will in the form of good. It is imagination, not being itself, that unifies truth and goodness.¹⁹³ Yet imagination is not "simply and onely a Messenger; but is inuested with, or at least wise vsurpeth no small authorities in itselfe," so much so that "in matters of *Faith & Religion*, we raise our *Imagination* aboue our *Reason*."¹⁹⁴ There is, as Socrates suggested in his own account of a tripartite soul, a polity among these parts, and Bacon confirms the Socratic doubt that rational persuasion can bring about their good ordering. Just as "in the gouernement of states, it is sometimes necessarye to bridle one faction with another, so it is in the gouernement within."¹⁹⁵ In morals and politics both, it is better to "sett affection againste affection, and to Master one by another," than to try to elevate those affections into some share of reason or persuade them to the good discerned by reason.¹⁹⁶

Like Socrates and Aristotle, Bacon argues that the human good depends on the rule of reason. Unlike Socrates and Aristotle, Bacon insinuates that what we call reason is really just a more provident form of desire. Both the affections and reason "carrie euer an appetite to good." Their orientation to the good does not distinguish reason and the affections, and here, at least, Bacon declines to introduce a distinction between the real good, which is the object of reason, and the apparent good, which is the object of the affections.¹⁹⁷ Instead, "The difference is, *That the Affection beholdeth meereley the present; Reason behouldeth the future, and summe of time*."¹⁹⁸ Reason is more provident

¹⁹³ *AL* II (OFB IV, 106).

¹⁹⁴ *AL* II (OFB IV, 106).

¹⁹⁵ *AL* II (OFB IV, 150).

¹⁹⁶ *AL* II (OFB IV, 150).

¹⁹⁷ In the parallel discussion in *DAS*, Bacon says "that the affections themselves carry ever an appetite to apparent good," but reason likewise is ordered to apparent goods. Cf. *DAS* VI.3 (*SEH* IV, 457). In introducing his discussion of moral knowledge in *DAS*, Bacon suggests that "right reason" governs the will, protecting it from being "seduced by apparent good." The parallel passage in *AL* does not make that distinction. Cf. *DAS* VII.1 (*SEH* V, 3) with *AL* II (OFB IV, 133).

¹⁹⁸ *AL* II (OFB IV, 128-29).

desire. In so recharacterizing reason, Bacon must also find a new justification for reason's rule. The goods the affections pine for are real goods and in many cases the same goods desired by reason, so there is no simple hierarchy of goods that allows reason's desires to be easily distinguished from or ranked above affection's desires. Neither does future good always outweigh present good. And reason's rule can no longer be justified as the perfection of man's nature. Still, the preference for those goods recommended by reason is not arbitrary, and we shall soon have to ask why far-sighted desire that aims at a ranging and lasting mastery is to be preferred above the short-sighted desire that heedlessly seeks immediate gratification.

Among appetites, the strongest wins. Reason—that is, provident appetite—enters the competition on the same terms but at a considerable disadvantage. The “sharpe disputations and Conclusions” natural to reason “haue no Sympathy with the will of Man”; “naked propositions and Proofes” lack the power to quell “the continuall Mutinies and Seditions of the Affections.”¹⁹⁹ Because the present is more vivid than the future, “*Reason* is commonly vanquished.”²⁰⁰ To rule, reason must become the strongest appetite. Eloquence is reason's best weapon, a fact which might fool us into thinking that reason gains mastery over the passions by elevating them into some share of reason. But what we call persuasion is really nothing more than “a Confederacie betweene the *Reason* and *Imagination*, against the *Affections*.”²⁰¹ The alliance between reason and imagination allows reason to contend on equal footing with the affections by making “thinges *future*, and *remote*, appeare as *present*” and give that future good a “corporall shape” and a “liuely representation.”²⁰² Imagination's ability to flesh out abstract and future good—its gift for translating reason's far-sighted desires into a form that can immediately move the will—is necessary because “the affections

¹⁹⁹ *AL* II (*OFB* IV, 128).

²⁰⁰ *AL* II (*OFB* IV, 129).

²⁰¹ *AL* II (*OFB* IV, 128).

²⁰² *AL* II (*OFB* IV, 128-29).

in themselves” are not “plyant and obedient to Reason.”²⁰³ But imagination’s sword, as it were, cuts both ways. Were imagination to side with the affections, “Reason would become Captiue and seruile.”²⁰⁴ Morality, then, is a “Negotiation within our selues,” the aim of which “is to procure the Affections to obey Reason, and not to inuade it.”²⁰⁵ The formula sounds traditional, but in fact inverts the old teaching. Rather than elevating the irrational soul into some share of reason, Bacon demotes reason and compels it to join the maelstrom of competing appetites.

Because imagination mediates between reason and will, ethics can almost wholly be reduced to rhetoric. “The dutie and Office of *Rhetoricke* is, *To apply Reason to Imagination*, for the better moouing of the will” or, in Bacon’s more political terms, “to fill the Imagination to second Reason, and not to oppresse it.”²⁰⁶ Misunderstanding man, Plato diminished rhetoric, esteeming it merely “a voluptuarie Art.”²⁰⁷ We see this scorn for rhetoric in Socrates’s own defense, in the contempt he has for anyone who would win a case by inflaming the passions rather than trusting his cause to cool reason. Similarly, Bacon faults Aristotle for failing to distinguish the significance of speech from its impression, or for failing to see, in other words, that “there is no man, but will be a little more rayised by hearing it sayd: *Your enemies will be glad of this . . .* than by hearing it sayd only, *This is euill for you*.”²⁰⁸ We can also hear in these complaints an echo of Machiavelli’s concern for the *effectual* truth. Properly understood, logic and rhetoric are both concerned with reason and truth. Logic “handelth Reason exacte, and in truth,” in a way unlikely to move men. Rhetoric “handelth it, as it is planted in popular opinions and Manners,” as it appeals to men’s interests and so as it can get results.²⁰⁹ To

²⁰³ *AL* II (*OFB* IV, 128).

²⁰⁴ *AL* II (*OFB* IV, 128).

²⁰⁵ *AL* II (*OFB* IV, 128).

²⁰⁶ *AL* II (*OFB* IV, 127-28).

²⁰⁷ *AL* II (*OFB* IV, 128). Cf. *VT* ch. 8 (*SEH* III, 228).

²⁰⁸ *AL* II (*OFB* IV, 130).

²⁰⁹ *AL* II (*OFB* IV, 129).

become active and effective, reason must embrace rhetoric and bind imagination: pure reason must become “*Imaginative, or Insinuating Reason.*”²¹⁰

The *Advancement* not only commends such insinuating reason; it practices it. And persuasion requires avoiding needless offense. So Bacon disguises his inversion of Socratic moral philosophy by seeming to praise it. The ancient philosophers “made good & fair Exemplars & coppies, carieng the draughts and pourtraiturs of *Good, Vertue, Duety, Felicity*, propounding them well described as the true obiects and scopes of mans wil and desires,” Bacon allows.²¹¹ “Againe,” Bacon graciously grants,

for the degrees, and Comparatiue Nature of Good, they haue also excellently handled it in their triplicity of *Good*; in the comparisons betweene a Contemplatiue and an actiue life, in the distinction between vertue with reluctance, and vertue secured; in their encounters between honesty and profit, in theyr ballancing of vertue with vertue, and the like; so as this parte deserueth to bee reported for excellently laboured.²¹²

But they neglected to learn or teach “how to attain these excellent marks, and how to frame and subdue the will of man to become true and conformable to these pursuities.”²¹³ This neglect is no small defect; it fatally undercuts the ancient philosophers’ teaching about man. The study of virtue is useless if it does not make us virtuous. Machiavelli, aiming to write something useful, preferred an effectual truth to the imagination of it and a careful study of what man does to the contemplation of what man ought to do.²¹⁴ So “surely if the purpose be in good earnest not to write at leasure that which men may read at leasure, but really to instruct and suborne Action and actiue life,” a description of virtue that does not make us virtuous cannot suffice. The point, though, is not that the ancients, preferring contemplations about virtue, neglected the more practical “husbandry & tillage” of it. The point is that their teaching about man’s good condemned them to that practical failure. A “*Georgickes* of the mind” is needful only because reason is not, as the Socratics supposed,

²¹⁰ *AL II* (OFB IV, 106).

²¹¹ *AL II* (OFB IV, 133-34).

²¹² *AL II* (OFB IV, 135-36).

²¹³ *AL II* (OFB IV, 134).

²¹⁴ Machiavelli, *The Prince*, ch. 15.

distinct from and set over the appetites.²¹⁵ If human nature and reason were as they supposed them, knowing the truth about virtue would make men virtuous and there would be no further need for a separate, practical science to teach how to subdue man's will and accommodate it to the good. Plato's Socrates said as much, that ignorance is the reason men misbehave.²¹⁶ Aristotle took a rounder view, but ultimately differed from his teachers only in giving a more nuanced description of the ways that vice and vicious deeds flow from a lack of knowledge.²¹⁷ Misunderstanding reason, appetite, and the relation between the two, the ancient philosophers "fayned an higher eleuation of Mans Nature, then was." Their "heroical descriptions" of virtue "commended them to Mans Nature, and spirite with greate quicknesse of Argumente, and beauty of persuasions, yea, and fortified and entrenched them (as much as discourse can doe) against corrupt and popular opinions," but beautiful and heroic speeches are not enough.²¹⁸ The Socratics lacked an effective moral science because they misunderstood the nature of reason and reason's relation to the appetites, or they understood reason's impotence and nevertheless taught that man's good consisted in reason's rule over the appetites and a nobler if limited contemplative good. Like Socrates and Aristotle, Bacon argues that the human good depends on the rule of reason, but what we call reason is really just a more provident form of desire. To really understand man and man's good, we will have to follow Bacon as he describes those universal appetites.

²¹⁵ *AL* II (*OFB* IV, 135).

²¹⁶ See, for example, *Meno*, 77b-78a.

²¹⁷ Aristotle's view is complicated and a matter of some controversy, but see *Nicomachean Ethics* II.5. Cf. *Nicomachean Ethics* VII.2.

²¹⁸ *AL* II (*OFB* IV, 135).

4.2.3 Bacon's Moral Argument against Ancient Contemplation

I argued in the previous sections that Bacon's implicit critique of Socrates's apology reorients moral philosophy away from reason's rule over the appetites to focus on the appetites themselves. At stake now is the right account of those appetites. Because it offers his most comprehensive discussion of those universal appetites in the context of human action, the best place to look is Bacon's account of moral philosophy in the *Advancement of Learning*.²¹⁹

In this "generall and faithfull perambulation of learning," Bacon proposes "to note onely omissions and deficiencies; and not to make any redargution of Errors, or incomplete prosecutions."²²⁰ But if we briefly trace the strange way his discussion of moral philosophy unfolds in the *Advancement*, it becomes pretty clear that Bacon's real target here is Socratic or contemplative philosophy. He begins with qualified praise: the ancients described well virtue, duty, and happiness, but failed to teach men how to become good. In short course, however, Bacon reverses this initial judgment, dismissing the ancient philosophers' "infinite disputations" about happiness and the highest good. They aimed too high and handled profanely questions better answered by faith. He then reverses his reversal, granting that, while they mishandled their inquiry into the highest good, they set down excellently many smaller points, among them "the comparisons betweene a Contemplatiue and an actiue life."²²¹ He soon withdraws even that more limited praise. The Socratic philosophers' doctrines would have been "lesse prolix, and more profound" had they consulted nature instead of popular opinions.²²² So Bacon next introduces his own account of the universal appetites, the roots and strings of good and evil. This naturalized moral science and Christian teaching both suggest that the ancient philosophers' judgment was wrong, that the charitable active

²¹⁹ *AL* II (*OFB* IV, 133-156). Cf. the parallel discussion in *DAS* VII (*SEH* V, 3-30). I have chosen to refer primarily to the earlier work and not along the way any discrepancies pertinent to my interpretation.

²²⁰ *AL* II (*OFB* IV, 61).

²²¹ *AL* II (*OFB* IV, 135).

²²² *AL* II (*OFB* IV, 136).

life excels the private and retiring contemplative life. More generally, Bacon's new moral science or Christian charity—at this point it is not clear which—“iudge and determine most of the Controuersies wherein *Morall Philosophie* is Conuersant.”²²³ Neither side in these controversies survives Bacon's critique. Aristotle, Socrates, Zeno, Epictetus, Epicureans, Cyrenaics, and the rest each in his way mistook lesser private good for the supreme good. Above all, they taught that man's good consists in a contemplative life, a life, as Bacon characterizes it, that retreats from the perturbations of pleasure and the business of civil life and spinelessly capitulates to nature and fortune. The principle that decides against them seems to be the precedence of the public over the private good. Their good was private not in the sense that they neglected the good of others, I will argue, but in the sense that they shrank from great desires and great deeds and allowed themselves to be shaped and mastered by circumstances. *Private* is more nearly synonymous with *pusillanimous*.

The precedence of the public over the private good is supposed to settle, for example, the debate between Zeno and Socrates, on the one hand, and the Cyrenaics and Epicureans, on the other, whether happiness is placed in virtue or pleasure (which virtue serves). Yet it is no easy thing to see how the higher worth of the public good can decide the issue. The man who prizes pleasure may nevertheless practice those virtues that “do chiefly imbrace and concerne society.”²²⁴ He may wish and work for others' pleasure, or the pleasure of others may be a condition of his own. And Socrates's apology shows that not every concern for virtue will coincide with the city's good. It is not obvious that pleasure is always merely a private good or that virtue invariably or straightforwardly promotes the public good. The argument shifts the focus away from virtue to a comparison of various Epicurean sects. They all “tend to priuate repose & contentment,” but as we learn later, the real issue is not between public and private, virtue and pleasure, but between different

²²³ *AL* II (*OFB* IV, 137).

²²⁴ *AL* II (*OFB* IV, 137).

kinds of pleasure. “In the pleasures of liuing creatures,” Bacon judges, “that of generation is greater than that of foode,” and “in life there is no mans spirit so soft but estemeth the effecting of somewhat that he hath fixed in his desire, more than sensuality.”²²⁵ That is, only a small-souled man would rank sensual pleasure as the highest good or seek the motionlessness of a soul in perfect repose.

Again, the superior worth of the public good is supposed to decide against those like Epictetus who “presupposeth that felicity must bee placed in those things which are in our power, least we be lyable to fortune & disturbance,” make an all-consuming occupation of avoiding temptations, and, fearing indignities and perturbations, “retyre too easily from Ciuile business.”²²⁶ Perhaps a “truly Moral” man is, as Bacon suggests, made of stouter stuff, steeled against “the greatest temptations and perturbations,” and more happy to fail in a glorious cause than to secure for himself lesser goods, but it is not his public-spiritedness that makes him great. Rather, he is great because he is not resigned, because he will not shrink in the face of a hostile or indifferent world.

Bacon’s real complaint against the contemplative life is not its lack of public-spiritedness, then, but rather its misunderstanding of man’s situation and the boldness it demands. After repeating Pythagoras’s picture of the philosophic life—that the philosopher is like the man who goes to the Olympic games not to compete for a prize, hock his wares, or carouse with friends, but merely to look on—he protests, “But men must know, that in this Theater of Mans life, it is reserued onely for God and Angels to be lookers on.”²²⁷ We cannot afford to keep our haughty distance or take a disinterested stance. The contemplative acts as if the world were a more hospitable place than it is in fact. He acts as if men were better and better provided for than in fact they are. Or

²²⁵ *AL II (OFB IV, 139)*.

²²⁶ *AL II (OFB IV, 138-39)*.

²²⁷ *AL II (OFB IV, 137)*.

at least he assumes that there is some safe retreat, that he can flee wickedness and pain through self-discipline, limiting his desires, and quitting public life. If no escape is possible in this life, he can escape through a death that may lead (as Socrates suggests) to man's greatest good. But the contemplative is wrong. True security and repose come, if they come at all, not from withdrawing from the battle, but from winning it. Pleasure deferred or too closely guarded is pleasure lost. So that man is best who is not too tender to dirty his hands, hazard temptations and perturbations, and try his strength in mastering his fortune.

Lucretius is no less contemplative, in this sense, than Plato and Aristotle. And that is why, despite his materialism and his view of the gods, he does not counsel men to become the masters of nature. The mastery of nature goal depends on a certain view of nature, but also a certain view of man and man's good. So long as man's good comes not from the arts, but from meditation and the limiting of desire, so long as true godlikeness is marked by detached tranquility and a dignified indifference to fortune, and so long as one believes both that the good is easily attainable and evil easily endurable, man has no reason to want to become the master of nature or fortune.

The contemplative is a strange mixture of sanguinity and fear. Trusting to providence or the basic goodness of the world, he is brought up short when he meets wickedness, impermanence, adversity, and want. So "most of the doctrines of the Philosophers are more fearefull and cautionary then the Nature of things requireth."²²⁸ How strange it is to hear Bacon, a man famous for proposing bodily immortality as a legitimate—and perhaps the highest—goal of natural philosophy, complain that the ancient philosophers have "encreased the feare of death, in offering to cure it." Their cure, however, is surrender and submission, and "they would haue a mans whole life, to be but

²²⁸ *AL II* (*OFB IV*, 141).

a discipline or preparation to dye.”²²⁹ Philosophy is man’s highest activity, and to philosophize, as Socrates memorably put it, is nothing but to practice for death.²³⁰ Socrates calmly faces his own, imminent death because he has spent his life making ready. Bacon fails to mention Socrates’s conviction that the true philosopher is naturally of good courage and of all men least afraid of death.²³¹ Perhaps he judged that such courage in the face of death is nothing more than an ignoble fear of life’s shocks and turns.

The contemplative also fears pleasure’s power and pleasure’s inconstancy in a way not worthy of man. Man’s basic desires are rooted in his mortality and his exposure to fortune. We think it a great matter to die a little later, said Seneca.²³² Boast not of tomorrow, for you know not what tomorrow will bring, Solomon warns.²³³ Because they are fleeting and uncertain, pleasure itself cannot be our highest good. Above all, we “desire to haue somewhat secured and exempted from Time,” to vanquish death and master fortune, but not in a state of static preservation.²³⁴ For as Seneca also said, boredom and surfeit easily conquer our fear of death.²³⁵ We also desire “much variety” in our “enterprises, pursutes & purposes of life,” for variety—pleasures and plans begun and advanced, frustrated and attained—make us more sensible.²³⁶ Vicissitude is bad only when it escapes our control. We want to live, yes, but also to spend ourselves in the living, “to preserue or continue” and “to dilate or Multiply.” Misunderstanding these desires, Socrates and Callicles quibbled whether felicity consists “in an equall and constant peace of mind”—in tranquil repose, free from pleasure’s pull—or “in much desiring, and much enjoying.” Callicles caricatures Socrates’s

²²⁹ *AL* II (OFB IV, 141).

²³⁰ Cf. *Phaedo* 67e and 61b-c.

²³¹ *Phaedo* 63e and 67e.

²³² *AL* II (OFB IV, 139). Bacon quotes Seneca, *Naturales Quaestiones* ii.59.7.

²³³ *AL* II (OFB IV, 139). Bacon quotes *Proverbs* 27:1.

²³⁴ *AL* II (OFB IV, 139).

²³⁵ *AL* II (OFB IV, 139). Cf. *Essays* “Of Death” (OFB XV, 12). Bacon loosely quotes Seneca, *Epistles* lxxvii.6.

²³⁶ *AL* II (OFB IV, 139).

tranquility as “the felicity of a block or stone,” and Socrates mocks Callicles’s great desiring as “the felicity of one that had the itch, who did nothing but itche and skratch.”²³⁷ One feared the perturbations and slavishness of giving himself over to his desires; the other feared the languor of desire peremptorily checked. Neither asked whether man’s nature may not be capable of both, of an appetite for preservation and an appetite for multiplication, or whether different men, dominated by one appetite more than the other, were not made happy by different pleasures. Plutarch judged better: it is a petty and anxious mind who abstains for fear of losing what he desires.²³⁸

There is a type of man who would infer the existence of a more perfect and more permanent world from the fact of this world’s ever-changing imperfection. If such a man were also convinced of his impotence to stay this world’s swirl and rush or ameliorate its evils, he would naturally seek the other, more perfect world as his true home. Because few men will think so ill of themselves, his unfitness for this life proves to him that he is too good for this world and gives him cause to hope for his just reward in the more perfect next. Such a man flees the sordid business of human things. To stay pure, he dedicates himself to “a priuate, free, and vnappplied course of life” so to make his mind more “vniforme and harmonicall.”²³⁹ This is “the Philosophers heauen” from which Bacon wants to deliver us.²⁴⁰

There is another and better type—a Prometheus set free by Herculean fortitude—at home in this world and unwilling to postpone his happiness until the next. Like the better musician, he has broken his hand to this world’s “strange and hard stoppes and passages.” Imitating “the wisdom of Iewellers,” he does not insist on a dainty purity, nor will he give up something of real worth because it is not perfect. If it will only cost him a bit of precious stone, he will ground out the grain

²³⁷ *AL II (OFB IV, 141).*

²³⁸ *AL II (OFB IV, 141).*

²³⁹ *AL II (OFB IV, 142).*

²⁴⁰ *AL II (OFB IV, 135).*

or cloud that mars it. Any larger perfections he will leave be. “So ought man,” Bacon counsels.

Fearful fastidiousness is the enemy of greatness. “*Serenity*” is a fine thing so long as its pursuit does not keep us from man’s business or “destroy . . . magnanimity.”²⁴¹

4.2.4 *Biblical Contemplation*

So it is not really public-spirited Christian charity that decides against contemplation. Despite Bacon’s framing of the problem, Christian moral law plays only a small and ambiguous role in his critique of ancient moral philosophy. That is because Christian moral teaching has more in common with Socratic contemplative philosophy than it would be prudent for Bacon to admit too openly. In order better to see, in the next section, the role Christianity is to play in his new synthesis, we must first see the likeness he draws between the Socratic and biblical contemplation.

Bacon acknowledges certain similarities between the ancient contemplative ideal and Christian moral teaching. For example, the Church teaches that the death of His saints is precious in the eyes of the Lord, that faithful men “exalt their Ciuile death.”²⁴² There is an undeniable tendency among men of faith to retire from worldly concerns and spurn worldly goods, to seek not the Kingdom of Man but the Kingdom of God, to suffer this vale of tears righteously so to be raised to true life among the blessed. Some of them even give themselves wholly to prayer and contemplation. So Bacon introduces an implausible distinction between the Christian and philosophical contemplative ideals. The “Monastical life” is contemplative, Bacon allows, but “not simple contemplative.” Adam and Enoch and Moses were all contemplatives; Enoch and Moses were not merely contemplatives. “Incessant prayers and supplications” are a kind of work

²⁴¹ *AL II (OFB IV, 142)*.

²⁴² *AL II (OFB IV, 137)*. Bacon quotes from *Psalms* 116:15.

performed for the good of others and the good of the Church. So, too, is prophecy and the study of God's law. Philosophical contemplation was wasted in privateness and leisure, but "for contemplation which should be finished in itselfe without casting beames vpon society, assuredly diuinity knoweth it not."²⁴³

But God assuredly does know such a contemplation. Bacon said so himself at the beginning of the paragraph that ends with his denial: men cannot be mere lookers on; God and His angels can.²⁴⁴ Bacon, as we just saw, also calls Adam the first contemplative without assigning him any specific, socially beneficial work. Bacon's mention of Adam sends us back to his apology to the divines, near the beginning of *Advancement I*, and his recitation of divine arguments and examples on behalf of learning near its end.

There, Bacon tells us that Adam and Eve's work in the Garden "could be no other than the worke of contemplation, that is, when the end of worke is but for exercise and experiment, not for necessitie."²⁴⁵ Their contemplation casts no beams upon society, nor did it need to. Contemplation in God's perfect Garden could only be for sport. In God's perfect care, such pure or unapplied contemplation is no sin. Had Socrates and Aristotle lived in Paradise instead of Athens, their contemplation would have been sinless, too. There is "no question the contemplatiue life"—"private, and respecting the pleasure and dignity of a mans selfe"—"hath the preemynence," but only in man's prelapsarian condition, under God's providential care.²⁴⁶

But we are no longer in Eden, and "in this Theater of Mans life," such leisurely contemplation is no longer seemly. Bacon's apology is premised on a sleight of hand: because Adam's natural knowledge was sinless before the Fall, Bacon's own project for a continual progress

²⁴³ *AL II (OFB IV, 137)*.

²⁴⁴ *AL II (OFB IV, 137)*.

²⁴⁵ *AL I (OFB IV, 34)*.

²⁴⁶ *AL II (OFB IV, 137)*.

in natural knowledge is likewise blameless. A full defense of natural knowledge would have to consider its goodness in this, our Fallen condition. Is Adam's natural knowledge still innocent after the expulsion, under the general curse and the strain of necessity?

A full defense, then, demands an account of Man's Fall. Man fell, lost Paradise, and suffers death, Bacon says, because he aspired to know good and evil "with an intent . . . to giue law vnto himself, and to depend no more vpon Gods commaundements."²⁴⁷ The original temptation and sin, then, was not knowledge itself, but the desire to revolt from God and govern himself by his own knowledge, "to make a totall defection from God, and to depend wholly vpon himselfe."²⁴⁸ In Eden, man's dependence on God was complete. God planted a garden with every food good to eat and placed man in it. He created each of the animals as a potential companion and helpmate for Adam. In rejecting God's rule, man forfeits all God's help. He is expelled from the Garden; the ground yields fruit only through his toil; the animals serve him only under compulsion; discord and suspicion rends the flesh made one in marriage; and he who was made for happiness and eternal life is made to suffer sorrow and death. Post-lapsarian Adam and Eve become quite literally the naked and defenseless beings Bacon describes in "Prometheus."

Unlike Prometheus, mankind in *Genesis* has a choice. Cain and Abel show us mankind's two possible responses to their parents' fallen condition. Abel, the shepherd, is an image of the contemplative life. He lives in view of heaven, rests in place, and enjoys leisure, tending his flock much as his parents tended their garden.²⁴⁹ Cain, the husbandman and representative of the "active state," takes on himself the full measure of his parents' punishment and plants his own garden to replace the garden they lost, tilling the ground, just as God's curse ordained. He cannot make God's

²⁴⁷ *ALI* (OFB IV, 6).

²⁴⁸ *ALI* (OFB IV, 34).

²⁴⁹ *ALI* (OFB IV, 34).

rain fall, and so Cain must depend on himself. To eek out a living, his one art must become many. He must learn to predict the weather, dig wells, and irrigate his fields or watch helplessly as his crops wash away or wither in drought. He domesticates his farm animals and becomes expert in their husbandry so he need not plow his fields with the strength of his own arms. Mining and metallurgy and leather-working are necessary to fashion his tools. Because even his best precautions will sometimes fail, he must also learn to store his harvest against famine. These many arts are better practiced by many men. As in Plato's *Republic*, the farmer's need of other arts is the seed that grows into a city.²⁵⁰ Fittingly, then, does *Genesis* credit Cain as the founder of the first city. In his line are the inventors of musical instruments and metallurgy, Bacon emphasizes. The story of the development of the arts and civilization, condensed to a few lines in *Genesis*, is the story of Cain and Cain's descendants.

Of these two states, the contemplative and the active, God clearly favors the first. He prefers Abel's sacrifice to Cain's. Abel had given to God what he had received from God; Cain's sacrifice is wanting because he offers God only what he had got for himself. Cain's fratricide ends Abel's line, but in time Adam and Eve beget a third son, Seth. In Seth's line is Enoch who "walked with God" and who does not die but, after 365 years, "was not; for God took him."²⁵¹ In Seth's line, too, is Noah, so named because he "shall comfort us concerning our work and toil of our hands, because of the ground which the Lord hath cursed."²⁵² Noah alone, "a just man and perfect in his generations," the first since Enoch who is said to walk with God, pleased God grown repentant of His creation.²⁵³ God's choice to begin again with Noah ends Cain's line, but not the human tendency it represents. As God reenacts creation through the flood and covenant, Noah and his sons repeat

²⁵⁰ Plato, *Republic* 370b. See also p. 366, above.

²⁵¹ *Genesis* 5:24.

²⁵² *Genesis* 5:29.

²⁵³ *Genesis* 6:6-9.

man's Fall. No sooner does God bless Noah and his sons and command them to be fruitful and multiply, giving to man meat as a means of subsistence other than farming, does Noah take up Cain's trade, become "an husbandman," and plant a vineyard. Drunk on the wine that vineyard produced, Noah falls asleep or passes out naked. His son, Ham, sees him naked and so is cursed.²⁵⁴ From Ham's line come the founders of great and infamous cities including Sodom and Gomorrah and Babel. At Babel, men used their arts to build a tower "whose top may reach unto heaven" and make for them a name. God "came down to see the city and the tower, which the children of men builded," an ambition, we learn from the Lord's speech, that would have enabled men to overcome every restraint.²⁵⁵ They wanted, as Bacon says Adam and Eve wanted, power that would rival God's without the limits imposed by God's commands.²⁵⁶

While God clearly favors the contemplative Abel over the active Cain, according to Stephen Gaukroger, "it is at best ambiguous whom Bacon favours."²⁵⁷ Bacon is certainly careful in laying out his case, but in the end there can be no mistaking his allegiances, either: Bacon sides with Cain. Gaukroger helpfully connects this impious (if ambiguous) judgment to Bacon's retelling of the Prometheus myth:

Despite the fact that Prometheus is effectively the inventor of the mechanical arts in the myth, Bacon cannot unambiguously allow Prometheus a heroic standing, for to do so would be to advocate a form of humanism in which God is effectively replaced, made redundant, as human beings shape their own conditions of existence (and hence, to some extent, destiny) without help from or dependence upon God. On the other hand, he cannot

²⁵⁴ *Genesis* 9:20-21.

²⁵⁵ *Genesis* 11:5-6.

²⁵⁶ Bacon explicitly connects man's first Fall and God's destruction of the Tower of Babel and the confusion of tongues at *AL* II (*OFB* IV, 121): "for Man still striueth to reintegrate himselfe in those benedictions, from which by his fault hee hath been depriued; And as hee hath stiuened against the first generall Curse, by the Inuention of all other Artes: So hath hee sought to come foorth of the seconde generall Curse, (which was the confusion of Tongues) by the Art of GRAMMAR."

²⁵⁷ Stephen Gaukroger, *Francis Bacon and the Transformation of Early-modern Philosophy*, 83.

seriously countenance any dependence upon God, precisely because he does want to make natural philosophy something that relies exclusively on human resources.²⁵⁸

Gaukroger correctly describes what is at stake in the Prometheus myth, though here again he is unwilling to resolve Bacon's ambiguities. Nor is his characterization of Bacon's reasons of much help. A wholly rational natural philosophy is not, for Bacon, an end in itself. His attempt to divorce natural philosophy from faith is either an act of rebellion, if man can in fact choose to depend again on God, or a courageous act made necessary because providence is wanting.

Bacon sometimes talks of his project to master nature as the recovery of that knowledge man lost at his Fall. "For by his fall," he says,

man lost both his state of innocence and his command over created things. However, both of these losses can to some extent be made good even in this life, the former by religion and faith, the latter by the arts and sciences. For the curse did not quite put creation into a state of unremitting rebellion, but by virtue of that injunction *In the sweat of thy face shalt thou eat thy bread*, it is now by various labours (not for sure by disputations and the idle ceremonies of magic) at length and to some degree mitigated to allow man his bread or, in other words, for the use of human life.²⁵⁹

Yet what we discover by art about fallen nature cannot be identical to that innocent and unfallen knowledge of unfallen nature. Adam's contemplation is not the same active contemplation Bacon advocates, not even the complete, active science achieved at the end of Bacon's project. If man's knowledge of fallen nature is unlike his knowledge of unfallen nature, the sinlessness of the latter cannot guarantee the sinlessness of the former. If loss of natural knowledge and, with it, loss of command over nature is part of mankind's punishment, its recovery, like Prometheus's theft, is a crime. In promoting a project to overcome the effects of the Fall through man's own, unaided effort, Bacon upends the story's apologetic power and basic moral teaching. The mastery of

²⁵⁸ Ibid., 82-83.

²⁵⁹ NO II §52 (OFB XI, 456).

nature—to labor, by continual progress in the arts, for man’s bread—is Cain’s part, not Abel’s, a man-made Tower of Babel secured even against God.

That Bacon’s project is more in Cain’s or Ham’s line explains why Bacon never (so far as I know) cites *Genesis* 1:26 or 28 in support of his project to master nature. The first verse couples God’s creation of man in His own image with God’s decision to grant man dominion over all the animals. The second verse begins with God’s blessing of man, a blessing that includes His command to subdue the earth and His gift of dominion over the animals. Together they would seem to sanction or even obligate man’s attempt to become again lord and master of creation. But there is a world of difference between keeping and tending the garden God planted and thinking it necessary to clear the land, turn the soil, and sow a garden anew. *Genesis* instead shows that we should live like Abel, that even after our expulsion and despite the curse, it is better to live in leisure and in view of heaven than to train our eyes down and bend our backs in toil.

I have traced here the similarities between Socratic and biblical contemplation from Bacon’s recounting of *Genesis*. In *Novum organum*, he moves in the opposite direction, giving ancient philosophical contemplation a “religious interpretation.”²⁶⁰ Nothing has corrupted philosophy more than superstition and “admixture of theology.” Plato is the “more dangerous and subtle example,” though we find similar evils whenever philosophers introduce “abstract forms, final and first causes.”²⁶¹ Final causality is the contemplative philosopher’s answer to the Christian’s faith in God’s providence. Since the very idea of final causes “obviously come from the nature of man rather than the universe,” the belief that the universe is governed by final causes is anthropomorphism.²⁶² Bacon

²⁶⁰ Kennington, “Bacon’s Concept of Mastery,” 11.

²⁶¹ *NO I* §65 (*OFB XI*, 101-03).

²⁶² *NO I* §48 (*OFB XI*, 87).

accuses theoretical reason of anthropomorphism, of making man the measure of what is.²⁶³

Anthropomorphism has a moral aspect, too. “For man would rather believe what he wishes to be true,” Bacon says, and what we want more than anything is to be assured, to believe that, despite appearances, the Good, Mind, or a providential God reigns.²⁶⁴ Socratic and biblical contemplation begin or end convinced that the world is already good, that whatever is is good insofar as it is, and that any defect of goodness is ultimately beyond man’s power to remedy. To believe that nature acts for the sake of the good does not differ practically from the belief that God will provide for His creation. Final causes, if they are real, must curb our ambitions and teach us proper limits. If nature acts for the sake of the good, nature provides a standard that should guide man’s actions. Nothing is possible for man that is not possible for God, and because God is also perfectly good and perfectly knowing, what He has not realized is better left undone. In such a world, art is denigrated and contemplation can only be grateful, wonderous, and inert looking-on. As Socrates sets himself against the city’s attempt to artfully achieve self-sufficiency, Abel’s contemplative way is set against Cain’s active, artful, and city-building attempt to survive God’s curse. So Bacon’s “Christian” argument against Socratic contemplation turns on itself. The greater worth of the active and public good convicts Socratic and Adamic contemplation equally. Or both Socratic and Adamic contemplation “hath a preemynence,” but only so long as man is provided for in the Garden. Socrates’s and Aristotle’s great error, then, was not realizing that they lived in a fallen world. For we who know better only one responsible course remains. Contemplation must become active and art-like to make good what we lost.

²⁶³ NO I §41 (*OFB XI*, 79-81).

²⁶⁴ NO I §49 (*OFB XI*, 87).

4.2.5 *Charity*

I have been arguing that Bacon's critique of the end of knowledge attempts to reverse the Socratic turn. In place of Socrates's interrogations of our opinions about the good, Bacon wants to root moral philosophy in those universal appetites that all bodies—human and non-human, both—strive to satisfy. This more “natural” view of man collapses the distinction between reason and appetite on which depends the ancient philosophers' argument in favor of the contemplative life. Contemplation like theirs aims at a more-than-human condition. But misunderstanding both man and nature, the contemplative philosopher strives for a divinity that is both too high and too low. Misplacing man's true greatness, he believes that to become a god, he must cease to be a man.

If not the contemplative's more-than-human divinity, what ought man seek? Our interpretation of “Prometheus” has already pointed the way to a new ideal, to an apotheosis of man made possible by his artful mastery of nature. And our interpretation of Bacon's apology for learning, his “science of man,” and his survey of moral philosophy have helped us uncover the dialectical origins of that Promethean ideal. To bring this part of our study to a close, I want to ask how *charity* figures in Bacon's new ideal.

Christ's command to love thy neighbor might seem to inspire or even justify Bacon's mastery project, but the neighbor- and God-loving Christian who trusts himself to God's provident care is really nothing like the provident, nature-mastering Prometheus. As we saw in the previous section, a pious reading of *Genesis* lends no support to Bacon's mastery project. Neither does a pious reading of the New Testament. Jesus sends the disciples out not to conquer nature, but to preach and, like good shepherds, to gather a wayward flock. He tells them not to take provision—neither money nor bag nor extra shirt or sandals.²⁶⁵ Sparrows are sold two for a farthing, yet not one will fall

²⁶⁵ *Matthew* 10:10-11.

to the ground without their Father. Why then should we, whose very hairs God has numbered, fear?²⁶⁶ God provides. Consider how He feeds the raven who neither sows nor reaps and who has no storehouse or barn.²⁶⁷ Consider how He splendidly clothes the lilies that neither toil nor spin.²⁶⁸ A rich man may build himself a barn large enough to lay up for many years and then take his ease, eat, drink, and be merry.²⁶⁹ He labors in vain since no man's treasure can save him from death and judgment. So Jesus teaches:

seek not ye what ye shall eat, or what ye shall drink, neither be ye of doubtful mind. For all these things do the nations of the world seek after: and your Father knoweth that ye have need of these things. But rather seek ye the kingdom of God; and all these things shall be added unto you. Fear not, little flock; for it is your Father's good pleasure to give you the kingdom.²⁷⁰

Should those earthly blessings fail, there will surely be just rewards in the heavenly Kingdom of God. Blessed are the meek and the merciful, the poor of spirit and the pure of heart. Blessed are they who mourn or make peace, they who hunger and thirst after righteousness or are reviled for their faith and persecuted for righteousness' sake.²⁷¹ They are the salt of the earth and the light of the world because they are not of—and certainly not masters of—this world.²⁷² Unrewarded here on earth, their reward is great in heaven.²⁷³

It is clear enough, I think, that Christian charity (and Christian moral teaching more generally) does not determine the goal of Bacon's mastery project. What sense can we make, then, of Bacon's talk of charity? He has obvious prudential reasons for disguising his heterodoxies and appealing to Christian readers, especially his Christian king. He knows that persuasion requires

²⁶⁶ *Matthew* 10:29-31 and *Luke* 12:6-7.

²⁶⁷ *Luke* 12:24.

²⁶⁸ *Luke* 12:27-28.

²⁶⁹ *Luke* 12:18-21.

²⁷⁰ *Luke* 12:29-32.

²⁷¹ *Matthew* 5:3-11.

²⁷² *Matthew* 5:13-14 and *John* 17:14-16.

²⁷³ *Matthew* 5:12.

telling men what is already in their hearts.²⁷⁴ So there is ample reason to believe that Christian rhetoric is a necessary vehicle for Bacon's un-Christian project. I will largely pass by these more rhetorical and serpentine purposes, though, to focus instead on the useful truth Bacon locates in Christian teaching. Christians and philosophers both defer man's good and make it conditional on transcending his all-too-human condition. On one reading, then, Bacon's charity is a *secularized* version of Christian charity. I want here to make that thesis more precise by drawing out the ways in which Bacon *instrumentalizes* charity, how transformed and stripped of its transcendences, charity can be made to serve as a necessary check on man's self-love.

In both the *Advancement* and *De augmentis*, Bacon concludes his review of moral philosophy with a discussion of "the most compendious and summarie, and againe, the most noble and effectual" "meanes" of making a man virtuous: "the electing and propounding vnto a mans selfe good & vertuous ends of his life, such as may bee in a reasonable sorte within his Compass to attaine."²⁷⁵ Bacon had faulted the ancient moral philosophers for spending themselves in the eloquent description of virtue while neglecting the means by which men could be made virtuous, but here he proposes that the best means to virtue is to dedicate and apply oneself to good ends. But these are not ends commanded by God or given by nature, nor are they beyond his compass. If a man will choose his own ends, and if he will limit himself to what is within his own power, he shall "Moulde himselfe."²⁷⁶

What end should man propose to himself? Back in Book I, Bacon had told us that the highest grade of honor among the heathens was "to obtain to a veneration & adoration as a God,"

²⁷⁴ See, for example, *AL* II (*OFB* IV, 145), where Bacon cites *Proverbs* 18:2 as the conclusion to his argument that we can do no good without the knowledge of evil.

²⁷⁵ *AL* II (*OFB* IV, 153-54). Cf. *DAS* VII.3 (*SEH* V, 28-29).

²⁷⁶ *AL* II (*OFB* IV, 153-54).

an aspiration that, for Christians, “is as the forbidden fruit.”²⁷⁷ In Book II, he quotes Aristotle’s description of the “excess” or superhuman virtue that makes men gods. (Tellingly, he does not cite Aristotle’s argument, in *Nicomachean Ethics* Book X, that man becomes godlike through contemplation.) Pliny the Younger went even farther, making Trajan not just godlike, but the pattern of divinity.²⁷⁸ But Christianity enjoins men to be godlike, too. The problem with these “heathen & profane passages” is that they have only “a shadowe of that divine state of mind” that the “holy faith” impresses.²⁷⁹ The question is, in what way should man be godlike? The “heathen Religion speaketh thus, *Optimus Maximus*, and the sacred scripture thus, *Misericordia eius super omnia oper eius*.” Should we aim to make ourselves the Best and Greatest, or should we more humbly imitate God’s mercy by loving our enemies, blessing those who curse us, and doing good to those who hate us?²⁸⁰

Bacon’s complicated answer is, both. Jesus exhorts the crowd, “Be ye therefore perfect, even as your Father which is in heaven is perfect.”²⁸¹ He commands us to be like the Father Who makes the sun to rise on good and evil alike and sends rain on both the just and the unjust.²⁸² But no man can command the sun or the rains. For a man, imitation of God requires meekness, to turn the other cheek and to give also your cloak to the man who takes your coat.²⁸³ Above all, it demands submission: “not my will, but thine, be done.”²⁸⁴ But David, in the psalm Bacon here quotes, praises both God’s mercy and His “terrible acts,” “wondrous works,” “power,” and “mighty acts.”²⁸⁵ God’s goodness is bound up with his greatness, God’s *misericordia* with something not altogether different from the heathen’s *Optimus Maximus*. Power without benevolence is terrible; benevolence without

²⁷⁷ *AL I* (OFB IV, 38).

²⁷⁸ *AL II* (OFB IV, 154). Bacon refers to Pliny the Younger, *Panegyrics*, 74.

²⁷⁹ *AL II* (OFB IV, 154).

²⁸⁰ *AL II* (OFB IV, 155). Bacon quotes *Psalms* 145:9 and *Matthew* 5:44-45.

²⁸¹ *Matthew* 5:48.

²⁸² *Matthew* 5:45.

²⁸³ *Matthew* 5:39-40.

²⁸⁴ *Luke* 22:42

²⁸⁵ *Psalms* 145:4-6 and 11.

power comes to naught. Bacon therefore seeks to make benevolence actually beneficent by joining selfless good will to self-interested power, to make man a powerful as well as a benevolent god.

Bacon brings about the rapprochement of power and benevolence in part by using charity to reclaim knowledge and power. At the end of his discussion of moral philosophy, Bacon reminds us that “aspiring to be like God in power, the Angells transgressed and fel” and that “[b]y aspiring to be like God in knowledge man transgressed and and fell.”²⁸⁶ But “neyther Man nor Angell euer transgressed or shall transgresse” in “aspiring to a similitude of God in goodnesse or loue.”²⁸⁷ Knowledge and power are the sort of goods you can misuse or have too much of. Charity alone admits no excess. But Bacon goes farther. Charity is a “correctiue spice” that can purify knowledge and power.²⁸⁸ Charity sets “true bounds and limits” for the pursuit of knowledge “yet without any such contracting or coarctation, but that it may comprehend all the vniversall nature of thinges,” including even “the proude knowledge of good and euill” and those universal appetites at the root of all natural motions and human actions.²⁸⁹ So sovereign a remedy is charity that those two great temptations, knowledge and power, can be sought without limit so long as they are sought for “the good of Men and Mankind.”²⁹⁰

But instead of bounding man’s pursuit of knowledge or the angel’s pursuit of power, charity licenses man’s pursuit of both knowledge and power without any constraint. In *New Atlantis*, the Father of Salomon’s House declares that “The End of our Foundation is the knowledge of Causes, the secret motions of things; and the enlarging of the bounds of Human Empire, to the effecting of all things possible.”²⁹¹ Not all discoveries, of course, serve man’s good. Even potentially beneficial

²⁸⁶ *AL II (OFB IV, 155).*

²⁸⁷ *AL II (OFB IV, 155).*

²⁸⁸ *AL I (OFB IV, 7).*

²⁸⁹ *AL I (OFB IV, 6-7).*

²⁹⁰ *AL I (OFB IV, 7).*

²⁹¹ *NA (SEH III, 156).*

discoveries—the printing press or the mariner’s compass, for example—carry significant risk. Some of those risks are hard to foresee. Others are easily predictable, but unforeseen benefits may outweigh those predictable risks. Because such calculations are little more than guesswork, the demand that science be charitable requires that science strive for knowledge and power unlimited by calculations of “charitable” utility. In our present state of knowledge we are not “yet learned or wise enough to wish reasonably,” Bacon argues.²⁹² Therefore the goal of beneficence transforms into the goal of unlimited knowledge and unlimited power, “the effecting of all things possible” or the “discovery of all operations and possibilities of operations from immortality (if it were possible) to the meanest mechanical practice.”²⁹³ So “let no man vppon a weake conceite of sobrietie, or an ill applyed moderation thinke or maintaine,” Bacon warns in the *Advancement*, “that a man can search too farre, or bee too well studied in the Booke of Gods word, or in the Booke of Gods workes; Diuinitie or Philosophie; but rather let men endeaour an endlesse progresse or proficiencie in both.”²⁹⁴

In *Valerius Terminus*, Bacon describes the expansion of human power in biblical terms, declaring that the highest end of knowledge “is a restitution and reinvesting (in great part) of man to the sovereignty and power . . . which he had in his first state of creation.”²⁹⁵ Charity by itself—a concern for the good of men without knowledge and power to effect their good—has no saving power in this life. If he be ignorant and impotent, the charitable man, like the meek and merciful, must wait for his reward in heaven. A less patient and less trusting charity, emboldened by greater knowledge and power, seeks a more immediate and more earthly good for man, to save him, here and now, if only in part, from God’s curse. This is Promethean charity or charity as mastery for

²⁹² *VT* ch. 9 (*SEH* III, 234).

²⁹³ *NA* (*SEH* III, 156) and *VT* ch. 1 (*SEH* III, 222).

²⁹⁴ *AL* I (*OFB* IV, 9). Cf. *VT* ch. 1 (*SEH* III, 220-21).

²⁹⁵ *VT* ch. 1 (*SEH* III, 222). Cf. *NO* II §52 (*OFB* XI, 447).

the relief of man's estate, a reenactment of man's original sin, an attempt "to give law vnto himself, and to depend no more vpon Gods commaundements."²⁹⁶

Christian charity, although it admits no excess, is marred by certain "errours." Bacon mentions a few pieces of Italian wisdom. "*Tanto buon che val niente*," the Italians ungraciously say: "*So good, that he is good for nothing*." So too Machiavelli "had the confidence to put in writing, almost in plaine Termes: *That the Christian Faith, had given up Good Men, in prey, to those, that are Tyrannicall, and unjust*."²⁹⁷ Bacon says, as we have seen, that all things, man included, have an appetite for two goods, one private and the other communicative, by a love of self and by a love of others. Christian charity is only an extreme expression of a more basic and more universal natural appetite. In many instances, perhaps in most, the pursuit of one comes at the cost of the other. Bacon characterizes the Christian religion as the most extreme partisan of the communicative good rooted in man's nature. "[T]here was neuer any phylosophy, Religion or other discipline, which did so playnly and highly exalt the good which is *Communicative* and depresse the good which is priuate and particuler as the Holy faith," he affirms.²⁹⁸ One might have thought that, since the same God who impressed nature's laws on inanimate bodies also commanded men to love and sacrifice for a good more general than their own, there would be a happier and more mutually reinforcing agreement between the moral law and nature, between man's duty to others and his love of himself. Yet so far does the Christian religion exalt the public or communicative good that its saints have wished to be "Anathematized" and "razed out of the Booke of life."²⁹⁹ To agree with one part of man's "double Nature of Good," Christianity must be set against its other.

²⁹⁶ *AL I* (OFB IV, 6).

²⁹⁷ *Essays* "Of Goodnesse And Goodnesse of Nature" (OFB XV, 39).

²⁹⁸ *AL II* (OFB IV, 136). Cf. *Essays* "Of Goodnesse And Goodnesse of Nature" (OFB XV, 39).

²⁹⁹ *AL II* (OFB IV, 137).

So Bacon proposes certain corrections meant to temper that extremism. “Seeke the Good of other Men, but be not in bondage, to their Faces, or Fancies,” he counsels. For the good man’s willingness to turn the other cheek or give away his cloak makes him easy prey for wicked men. God sends his rain and makes the sun to shine on the just and unjust both, “But hee doth not raine Wealth, nor shine Honour, and Vertues upon Men equally.” Like God, then, give what is common to all, but give “peculiar Benefits” with “choice.” Bacon does not say how that choice should be made, but he does advise us not to give “*Æsops* Cocke a Gemme, who would be better pleased, and happier, if he had had a Barly Corne.” Give, that is, what is useful instead of what is precious, or give men not what you think ought to make them happy, but what will really make them so.³⁰⁰ “If thou wilt be perfect,” Jesus tells a young man, “go and sell that thou hast, and give to the poor, and thou shalt have treasure in heaven: and come and follow me.”³⁰¹ Bacon counters that a man should sell everything only if he has “a Vocation, wherein though maist doe as much good, with little means, as with great.”³⁰² To be charitable, then, we cannot be perfect. The heavenly treasure that young man would lay up for himself probably cannot do as much good for others as his earthly treasure can, now. And above all “beware, how in making the Portraiture, though breakest the Patterne: For Divinitie maketh the Love of our Selves the Patterne; The Love of our Neighbours but the Portraiture.”³⁰³ Self-love prudently limits our selfless love for others.

Though the Christian exaltation of the “communicative” good makes men “good for nothing” and easy prey for unjust men, self-love unchecked sets man against both man and God. Knowing well his own mortality and exposure to fortune, such a man desires above all “to dilate and Multiply,” to be “secured and exempted from Time” and achieve a measure of immortality in the

³⁰⁰ *Essays* “Of Goodnesse And Goodnesse of Nature” (OFB XV, 39-40).

³⁰¹ *Matthew* 19:21. Bacon leaves out the promise of heavenly treasure. Cf. *Essays* “Of Goodnesse And Goodnesse in Nature” (OFB XV, 40).

³⁰² *Essays* “Of Goodnesse And Goodnesse of Nature” (OFB XV, 40).

³⁰³ *Essays* “Of Goodnesse And Goodnesse of Nature” (OFB XV, 40).

memory of his great or terrible deeds.³⁰⁴ Such a man's inclination has in itself no "identity with the good of Society" and may, in exceptional men, "recedeth furthest from good of Society." These "troublers of the world" if unchecked "would haue all men happy or vnhappy as they were friends or Enemies, and would giue fourm to the world according to their own humors." Theirs is a "Gygantine state of mind"; their willful reshaping of the world "the true *Theomachy*."³⁰⁵

Bacon's bet is that such men's selfish ambitions can be put in the service of the public, charitable good, that self-love can be made benevolent. No straight thing was ever made out of the crooked timber of humanity, Kant famously said. Man is misled by "self-seeking" and "animal instincts" to exempt himself from the law he rationally knows should limit his freedom.³⁰⁶ But even a "race of devils" can bring about a perpetual peace by exploiting the mechanisms of nature to order conflicting private intentions to the common good.³⁰⁷ For Bacon, that reordering of nature for the sake of a charitable, common good occurs first and most importantly in the crooked timber of those "great Politiques" who love themselves most and other men least. Those great troublers will reshape the world for the better if "Acts of *Beneficience*" can be made to promote "a mans own power, glory, amplification, [or] continuance."³⁰⁸ The greatest and most one-sided self-interest, that is, can be put in the service of the greatest charitable, public good.

What Bacon proposes is a kind of mastery of human nature. The key is knowing that human nature, like nature generally, is conquered only by obeying it.³⁰⁹ In human things, that obedience means respecting the basic appetites, the natural roots and strings that are the real cause of human

³⁰⁴ *AL II (OFB IV, 139)*.

³⁰⁵ *AL II (OFB IV, 140)*.

³⁰⁶ Immanuel Kant, *Idea for a Universal History with a Cosmopolitan Intent*, in *Perpetual Peace and Other Essays on Politics, History and Morals* (Indianapolis: Hackett Publishing Company, 1983), Sixth Proposition.

³⁰⁷ Immanuel Kant, *Perpetual Peace*, in *Perpetual Peace and Other Essays on Politics, History and Morals*, First Supplement.

³⁰⁸ *AL II (OFB IV, 140)*.

³⁰⁹ *NO I §3 (OFB XI, 65)*.

action. Because “in the Culture and Cure of the mynde of Man, two thinges are without our commaund: Poyntes of Nature,”—here, those basic appetites—“and pointes of Fortune,” we must take men as they really are, not in some perfect world but in this very imperfect world.³¹⁰ The appetite toward self-good is universal and unfailing. The appetite toward the good of others is real and not uncommon, but it cannot be trusted. Man will sacrifice his own life to do his duty but only “if he degenerate not.”³¹¹ It would be a mistake to try to change man’s nature or quash an appetite as strong as man’s self-love. “*Nature* is Often Hidden; Sometimes Overcome; Seldome Extinguished.” We can try to suppress our appetites by “Doctrine and Discourse,” but “let not a Man trust his Victorie over his *Nature* too farre; For *Nature* will lay buried a great Time, and yet revive, upon the Occasion or Temptation,” and “Force maketh *Nature* more violent in the Returne.”³¹²

If we start with man as he really is—moved reliably by self-love and less reliably by a love for others—we will have greater command in those “things wherein nature admitteth a *latitude*.”³¹³ Man can be *re-natured* by giving his most basic appetites a new shape and direction without changing those basic appetites themselves. We call this renaturing *education* or *custom*. Aristotle talks about habit as a sort of nature—sometimes translated as a “second nature”—and quotes Evenus’s opinion that a man’s training becomes his nature.³¹⁴ Bacon, too, argues that men’s “Deeds are after as they have beene *Accustomed*,” calls custom “the Principall Magistrate of Mans life,” and urges men “by all Meanes . . . to obtaine good *Customes*.”³¹⁵ But his appeal to nature and custom is of a different kind than Aristotle’s. Neither is it grace’s perfection of human nature, the new man created through faith in Christ. For Aristotle, nature is form, a governing ideal, that which a thing strives to be. Habits are

³¹⁰ *AL* II (OFB IV, 147).

³¹¹ *AL* II (OFB IV, 136).

³¹² *Essays* “Of Nature in Men” (OFB XV, 118-19).

³¹³ *AL* II (OFB IV, 151).

³¹⁴ See Aristotle, *Nicomachean Ethics* VII.10.

³¹⁵ *Essays* “Of Custome and Education” (OFB XV, 121).

good or bad just insofar as they conform to or realize that ideal grasped by reason. The underlying nature that Bacon appeals to is not form or ideal, but nature as motive or generating force, what we earlier identified as *natura naturans*. Bacon and Aristotle differ not just in their accounts of what man's nature is—individualistic or political, appetitive or rational, base or noble—but in what it means for man to have a nature. Custom, then, is the rearrangement of those appetites or forces into a novel configurations, into new *natura naturata*. Thus practical moral philosophy is really just a part of practical or operative natural philosophy. The general goal of operative natural philosophy is to superinduce new natures on a given body. The narrower goal of practical moral philosophy is to superinduce new virtues on men.³¹⁶

In his *Essays*, Bacon eases into the ways in which man's appetites can be reshaped and redirected and new virtues superinduced. The "Noblest works, and Foundations, have proceeded from *Childlesse Men*," Bacon argues, because they "sought to expresse the Images of their Minds; where those of their Bodies have failed." A man who cannot "mitigate the Remembrance of Death" by siring a son will mitigate it instead by his great deeds and in this way "the care of Posterity, is most in them, that have no Posterity."³¹⁷ Likewise, "amongst all the great and worthy Persons . . . there is not One, that hath beene transported, to the mad degree of *Love*," not because (as Bacon seems to suggest) great person suffer weak passions, but because "There is in Mans Nature, a secret Inclination, and Motion, towards *love* of others; which if it be not spent, upon some one, or a few, doth naturally spread it selfe towards many; and maketh men become Humane and Charitable."³¹⁸ That same "Inclination to *Goodnesse*" resurfaces in "Of Goodnesse And Goodnesse in Nature." So deeply imprinted in man's nature is this inclination "that if it issue not towards Men, it will take unto

³¹⁶ Bacon talks of "superinducing" habits at *AL* II (*OFB* IV, 151). He speaks of "the great Multiplication of Vertues upon Humane Nature" at *Essays* "Of Custome and Education" (*OFB* XV, 122).

³¹⁷ *Essays* "Of Parents and Children" (*OFB* XV, 23).

³¹⁸ *Essays* "Of Love" (*OFB* XV, 31-33).

Other Living Creatures.” The “Turks,” for example, are cruel to men but kind to beasts.³¹⁹ Each of these examples shows how men’s appetites can be turned to more charitable ends.

The Kingdom of Man serves as an ideal for the generous-spirited, but it those natural misanthropes—men with a “Naturall Malignitie, the “very Errours Humane Nature,” and those most deficient in charity—who “are the fittest Timber, to make great Politiques of” and, potentially, mankind’s greatest benefactors.³²⁰ They practice what Bacon calls *wisdom for a man’s self* or the *architecture of fortune*. His discussion of these arts of advancement in the *Advancement of Learning* seem out of proportion, as he concedes.³²¹ They are the focus of Bacon’s *Essays*, and unsurprisingly many of the counsels in the *Advancement* are developed in various essays. Robert Faulkner traces out an artful progress in the essays aimed at liberating the ambition of self-made men and constructing a society that can channel their self-interest toward the mastery of nature for the relief of man’s estate.³²² Here I want only to highlight a few of Bacon’s more important arguments.

Bacon begins the essay titled “Of Wisdome for a Mans selfe” with an argument against the artful coincidence of private and public good. “Men that are great *Lovers* of *Themselves*, waste the Publique,” he says, and “It is a poore Center of a Mans Actions, *Himselfe*.” Wisdom for a man’s self is the wisdom of rats who abandon a house just before it falls, the wisdom of foxes who seize the den another animal labored to dig, the wisdom of crocodiles who shed tears as they devour their prey.³²³ Better to “Divide with reason betweene *Selfe-love*, and *Society*: And be so true to thy *Selfe*, as

³¹⁹ *Essays* “Of Goodnesse And Goodnesse in Nature” (OFB XV, 39).

³²⁰ *Essays* “Of Goodnesse And Goodnesse in Nature” (OFB XV, 40).

³²¹ *AL* II (OFB IV, 176). Bacon’s discussion of this wisdom for a man’s self (OFB IV, 163-79) is some 12% of *AL*’s second book, which proposes to canvass the whole of human knowledge, including its deficiencies.

³²² See Robert Faulkner, *Francis Bacon and the Project of Progress* (Lanham, MD: Rowman & Littlefield Publishes, 1993), 27-56. See also Rexmond C. Cochrane, “Francis Bacon and the Architecture of Fortune,” *Studies in the Renaissance* 5 (1958), 176-95.

³²³ *Essays* “Of Wisdome for a Mans selfe” (OFB XV, 74).

thou be not false to Others.”³²⁴ That restriction is relaxed in the case of a sovereign prince because sovereigns “*Themselves* are not onely *Themselves*” and “their Good and Evil, is at the perill of the Publique Fortune.”³²⁵ Bacon’s argument here inverts Socrates’s. Socrates had said that the philosopher was best suited to rule because he wanted to rule least. Despising the private goods that come from rule, he could act solely for the common good. In Bacon’s recapitulation, the private and public good instead meet in the person of the ruler, and to promote the ruler’s own good is to promote the common good. In “Of Fortune,” any such restriction disappears. “*Faber quisque Fortunae suae*”—each man, not only kings, makes his own fortune, and “Extreme Lovers of their Countrey, or Masters, were never *Fortunate*.” Nor can they be, “For when a man placeth his Thoughts without Himselfe, he goeth not his owne way.” Others’ follies are great opportunities for one’s own advancement, and so self-love comes at the expense of others: “*Serpens nisi Serpentem comederit non fit Draco*.” The architecture of fortune turns on “Secret and Hidden Vertues”: strength and a single-minded focus on one’s own good joined to an adaptable and versatile nature willing to dissemble when it profits. A man, for example, can check envy and magnify his greatness by crediting “Providence and *Fortune*” for what he wins by his own virtue.³²⁶

Armed with this brief summary of the architect of fortune and his virtues, we can now see that Bacon himself practices a similar deception in the *Advancement* by crediting charity for deeds done from self-interest. We each in some sense love and wish to preserve a “greater Bodye” of which we are members. To show the universality of this “Nature of Good,” Bacon presents a series of examples, ascending from the natural motions of inanimate bodies to the saintly epitome of charity. The central element in that series and Bacon’s first and only particular example of a human

³²⁴ *Essays* “Of Wisdome for a Mans selfe” (OFB XV, 73). Here Bacon seems to reverse his advice, in “Of Goodnesse And Goodnesse in Nature” (OFB XV, 40), to limit one’s love of neighbor by one’s love of self.

³²⁵ *Essays* “Of Wisdome for a Mans selfe” (OFB XV, 73-74).

³²⁶ *Essays* “Of Fortune” (OFB XV, 122-24).

who chooses a public over a private good is Pompey the Great, a pagan Roman. If we look a little closer, though, we will see that Pompey, though an imperfect “Politique,” is a first-rate example of how a man’s self-love can advance the public good. As Bacon tells it, Pompey, against the strenuous pleas of his friends, hazards his own life to feed a famished Rome. The example is especially important because it shows us a non-Christian instance of the natural inclination toward a more general or public good. But Bacon disingenuously Christianizes the story. As Plutarch tells it, Pompey is not dissuaded by friends concerned for his safety, but by the ships’ captains worried for their own. He is moved more by his own hunger for power than a charitable concern for hungry Romans. Plutarch praises Pompey’s boldness and zeal, not his charity.³²⁷ We can also surmise that, if Pompey’s real aim was to relieve the famine, surely the more prudent course, his own safety aside, was to wait out the storm and avoid the risk of losing the grain. The necessity that moves Pompey to risk his life, the lives of the crew, and the much-needed grain is not, or at least not principally, the good of the Roman people, as Bacon’s description suggests, but Pompey’s own, considerable ambition. He “could boast—and did!—of taking 800 ships, 1,000 fortresses, and 900 towns, and bringing 20,000 talents to the Roman treasury. He had carried the eagles of Rome from the Atlantic to the Caucasus” and been honored with three triumphs.³²⁸ But he had since given up his armies. To deliver relief to a desperate country in such spectacular fashion—to fill “the sea with ships and the markets with grain, so that the excess of what he had provided sufficed also for foreign peoples, and there was an abundant overflow, as from a spring, for all”—is perhaps the only way that Pompey can contend with Julius Cæsar grown great through his command in the Gallic wars.³²⁹ We need not trust the argument to Plutarch’s judgment or our own surmise since Bacon himself notes Pompey’s

³²⁷ Plutarch, *Pompey* 50.

³²⁸ H. P. Collins, “Decline and Fall of Pompey the Great,” *Greece & Rome* 22, no. 66 (1953), 103.

³²⁹ Plutarch, *Pompey* 50. The translation is *Plutarch’s Lives*, trans. Bernadotte Perrin (Cambridge: Harvard University Press, 1917).

ambition. He sought “in a more darke and dissembling manner” the same ends as Cæsar, Augustus, and Lucius Sulla—the very Sulla who is the model of those troublers of the world who would have all men happy or unhappy as they were his friends or enemies—and “made it his desseigne by infinite secret Engines, to cast the state into an absolute Anarchy and confusion, that the state mought cast it selfe into his Armes for necessity and protection, and so the soueraigne power bee putt vpon him.”³³⁰ Pompey was an imperfect architect of fortune, lacking the height of those secret and hidden virtues necessary to master fortune.³³¹ Unlike Sulla who was “fierce, violent, and pressing the fact,” Pompey was perhaps too “solemn, and full of Maiesty and circumstance, and therefore the lesse effectuall.” It is no mean thing to feed a world he had previously conquered, but if he had been a greater “Politique,” perhaps he could have done more good.

So rather than making devilish, self-interested men moral, the trick is to reward self-interest that has some “incidence” with the public, charitable good with the sorts of goods that appeal to self-interest. Such a realignment is precisely what Bacon attempts near the end of the first book of the *Advancement* by ranking the grades of honor. Among the heathens, apotheosis was the supreme honor a man could attribute to man. Founders, law-givers, extirpators of tyrants, and others eminent for civil merit were esteemed “Worthies or Demy-Gods”—Hercules, Theseus, Minos, Romulus, and the like. But inventors of “new Arts, endowments, and commodities towards mans life, were euer consecrated amongst Gods themselues”—Ceres, Bacchus, Mercurius, Apollo, and others, “and justly.” For the benefits of political men are limited in time and place; the benefits of inventors “are premanent and vniuersall” and less mixed with strife, more “like the benefits of Heauen” and “the

³³⁰ *AL II* (OFB IV, 173-74). Cf. *AL II* (OFB IV, 140). Bacon’s authorities are Tacitus (*Histories* ii. 38) and Sallust (in Seutonius, *De grammaticis et rhetoribus*, 15). In *Essays* “Of Wisdome for a Mans selfe” (OFB XV, 74), Bacon repeats Cicero’s remark that Pompey is a lover of self without rival. See Cicero, *Epistulae ad Quintum fratrem* iii.8.4.

³³¹ *AL II* (OFB IV, 174) and *Essays* “Of Wisdome for a Mans selfe” (OFB XV, 74-75).

true Character of diuine presence.”³³² In *Novum organum*, Bacon again ranks the arts above politics, and for the same reasons. He again appeals to “the judgment of ancient times” and again argues that the arts are more generally, more lastingly, and less violently beneficent. There are thus “three kinds and (so to speak) grades of human ambition. Lowest is the “commonplace and contemptible” desire to increase one’s own power. “[L]ess base but no less greedy” are those who strive to increase the power and status of their own country. But the highest, “more sober and more majestic” ambition “strives to renew and increase the empire of humanity itself over the whole universe of things.”³³³ This highest ambition is no longer “greedy” because the benefit is perfectly general or nearly so.

But generality of benefit insufficiently distinguishes the honor due to the highest political ambition from the honor due to the highest technological ambition. One sign is Bacon’s use of the word *empire* to describe what is supposed to be a supra-political ambition. We could also ask whether the properly political ambition is necessarily bounded. The desire to increase the power of one’s own country could be universalized by a world state. This all-encompassing political ambition is not the same as the technological mastery of nature because they achieve different goods. Politics is a cure for “the inconvueniences which grow from man to man” whereas art and science benefit man by “relieuing the necessities which arise from nature.” Those political goods are not “much inferior” to the transpolitical goods, but inferior nonetheless.³³⁴ As Kennington convincingly argues, “for Bacon longevity and vigor of bodily existence, as well as comfortable and affluent life are greater goods

³³² *ALI* (OFB IV, 38). Elsewhere, Bacon more finely distinguishes the grades of civil merit without mentioning man’s godlike rule over the universe of things. Lowest are those who merely “reign justly, and make the Times good, wherein they live.” Above them are those who enlarge a country’s territory or protect it from invasion. Higher yet are those who free their country from tyrants or end civil wars. In the penultimate place are the “*Second Founders*” who make laws. But best and most honorable are those who, like “*Romulus, Cyrus, Cæsar, Ottoman, [and] Ismael*,” found a new state. See *Essays* “Of Honour and Reputation” (OFB XV, 164).

³³³ *NO I* §129 (OFB XI, 195).

³³⁴ *ALI* (OFB IV, 38-39).

than political freedom.”³³⁵ So while Machiavelli was right that “the coincidence of highest benevolence and power merits the highest glory,” he was wrong in believing that new political modes and orders were the height of man’s powers or that man’s greatest good was essentially political.³³⁶ Baconian charity is every bit as worldly and realistic as Machiavelli, but takes from Christianity—albeit in a way Christianity could never accept—a transpolitical view of man’s nature, his power, and his good. Politics properly understood is just another art and the self-sufficiency man sought in political community always depended on the self-sufficiency provided by man’s art. True self-sufficiency requires a more comprehensive mastery, a more general empire. If we are to depend no more on God, we must seek a power approaching His.

Mastery makes man a god to man, but not all gods are equal. Most people will become godlike “not just for the relative benefits and helps they enjoy, but also for their sheer material lot.”³³⁷ Bacon’s nature-mastering science will be known to most only through its fruits and will be godlike only insofar as they enjoy a godlike affluence. Those involved in the discoveries are godlike in another and higher sense, for “Discoveries are also like new Creations repeated, and imitations of God’s handiwork.”³³⁸ Nature shows and pleasure confirms that the sense of power excels the desire for comfort or preservation, that it is “more worthy” to be the agent than the patient, the benefactor than the benefited.³³⁹ But Bacon awards himself the highest honors. “[I]f the utility of any one particular discovery has so moved men that they regard him who could confer such a benefit on the whole of the human race as more than a mere mortal,” he asks, “how much more noble will it seem to discover something to enable everything else to be rapidly discovered by means of it?”³⁴⁰ Like the

³³⁵ “Bacon’s Humanitarian Revision of Machiavelli,” 74.

³³⁶ Kennington, “Bacon’s Humanitarian Revision of Machiavelli,” 60-61.

³³⁷ *NO I* §129 (*OFB XI*, 195).

³³⁸ *NO I* §129 (*OFB XI*, 193).

³³⁹ *VT* ch. 8 (*SEH III*, 229-30) and *AL II* (*OFB IV*, 139).

³⁴⁰ *NO I* §129 (*OFB XI*, 195-97).

ancient contemplative philosophers, Bacon wants to become godlike. But unlike the ancient contemplative philosophers, he knows that divinity is not exhausted by leisurely contemplation. The god worth becoming is also charitable and creative and glorified for being so. Man's highest aspiration is un-Christianly Christian, to become a provident and creative god. Charity becomes the quest for unlimited knowledge and unlimited power, the mastery of nature for the relief of man's estate, the realization of the Kingdom of Man that frees man from the reign of that other Kingdom and finally makes him his own master.

Conclusion

We started in perplexity: method, according to its own impossible logic, should be a precondition of the discovery of method. To resolve that perplexity, we need to distinguish between Bacon's methodically disciplined science and a pre- or non-methodical philosophy, between the method itself and the *methodology* that grounds it. Our inquiry into Bacon's methodology—his *refounding* of philosophy—allowed us to see that his method grows out of his rejection of Socrates's earlier refounding of philosophy, an argument against the tradition that he extends to a critique of naïve or pre-philosophical human reason.

That critique points to a new idea of nature. In short, Bacon identifies the salient features of the old idea of nature and negates them. Nature cannot be discovered in its *looks* because nature hides. There are no final causes in nature, and nature is not ordered to man's contemplative or practical good. The species or kinds we encounter in ordinary experience do not exhaust nature's possibilities. Those natures or forms are not ultimate. All that really exists are individual bodies performing individual acts according to law. Species-neutral laws, not specific forms, are the real causes in nature and the proper object of science. We will discover those laws when we dissect nature and get finally to nature's minima. Knowledge of those laws will give us operative power over nature. By reordering its parts, we can remake nature for our own use.

That new idea of nature is not the result of Bacon's new science, but its ground. That new science or method is just Bacon's new regulative idea of nature made active or cast into a set of procedures. Thus we were able to draw out Bacon's new idea of nature by paying attention to his critiques of the old philosophy's starting point, order of demonstration, and end.

We considered first his critique of the old philosophy's starting point (Chapter 2). His new science is grounded not by the "ordinary" or "natural" experience the first philosophers appealed to, but an *artificial* experience laid up in his new natural histories and constituted by experience-generating strategies and reason-guided experiments. Because nature itself does not point us toward the truth, Bacon's prescriptions for artificially generating and gathering experience can only be guided by his own idea of nature.

Bacon's critique of the old philosophy's order of demonstration—about *how* we know—is just as truly a critique of *what* we know (Chapter 3). While he keeps the old term, Bacon's science aims for knowledge of an altogether new object. A Baconian *form* is a *law* correlating two *natures*. Bacon's forms are the principles that make possible the rapprochement of knowledge and power and the reconciliation of skepticism and dogmatism.

We ended where Bacon starts, with a critique of the end of knowledge. Bacon's interpretation of the Prometheus myth pointed to a new kind of hero, a godlike and benevolent master of nature who combines Promethean foresight with the Herculean wisdom to enjoy its pleasures. We reached a similar conclusion in working through Bacon's science of man and his recapitulation of moral philosophy in the *Advancement of Learning*. The argument in the *Advancement*, however, appeals to another Baconian anticipation of nature—to his presupposition of basic and universal natural appetites—and to the operative moral science that aims to superinduce new virtues. We become like gods by mastering both non-human and human nature.

It is worth dwelling for a moment, here at the end of our investigation, on the mediated character of Bacon's refounding of philosophy. To see fully his founding act, we must distinguish Bacon from the scientific laborers he seeks to instruct and the non-philosophic public whose

support he hopes to win through the fruits of his new science. We know Bacon as the visionary advocate of corporate science. He saw that a science based on experience and experiments such as he proposed would need many eyes, ears, and hands, and that the work would cost a king's fortune. He asked for help—for money from his sovereign, for experiments and natural histories from the sons of science, and for the faith of everyone else who would know his works only through the benefits he promised they would bring. But that assistance was always to be marshaled and directed by Bacon himself. He set the goal and showed the way, and at least once reserved for himself the work's completion. Though he must employ factors and merchants, the Lord Chancellor is the great project's yet-greater architect.¹

Though Bacon's science is new, science itself is not. An act of refounding is crucially different than the act of original founding. New approaches must confront the old ways; novelty must contend with—and so in some measure be shaped by—that which it seeks to replace. Philosophy first emerges as a new possibility within the pre-philosophical “life-world,” the city governed prudentially by statesmen and provisioned by the technical know-how of its artisans. First and last things, the coming-to-be of the gods and the world, men and their cities, are the poets' ken. Philosophy, itself neither active nor productive, comes on the scene seeking to supplement prudence and know-how with knowledge of principles and causes, not just about human action but about the super-human whole that men can neither produce nor control. It is as the poets' rival that philosophers begin to rationally contemplate—to *theorize*—the world.

Unlike philosophy's first founding, Bacon's new science takes as its starting point not the opinions of statesmen and artisans, but those earlier attempts to give a rational account of the world

¹ William Rawley, Francis Bacon's chaplain, said, “I haue heard his Lordship speake complainingly; That his Lordship (who thinketh hee deserueth to be an Architect in this building,) should be forced to be a Work-man and a Labourer; And to digge the Clay and burne the Brick; And more then that, (according to the hard Condition of the israelites at the latter end) to gather the Straw and Stubble ouer all the Fields, to burn the Bricks withal.” See *JS* “To the Reader” (*SEH* II, 336).

in which statesmen act and artisans produce. Though Bacon proposes to take us back to the things themselves, his science, or at least his own founding of that science, must deal with the world at one extra remove: to tell us how to get to things themselves, Bacon must first free us from inveterate prejudices and the old, wrongheaded attempts to grasp the world philosophically. Philosophy refounded, that is, is necessarily a critical philosophy. If philosophy for Socrates, Plato, and Aristotle begins in wonder, Bacon's philosophy begins with the dogmatic certainty of both our ignorance and our impotence. The only real wonder, Bacon says, is that no one before him understood the true state of man's knowledge. His deep suspicions about received doctrines and unaided reason's ability to know the world are, for Bacon, the founding fact.

Bacon's new science thus presupposes the earlier (inadequate) discovery of nature. His own access to nature is mediated by the ancient science he rejects.² His new science is unthinkable without the two-thousand-year history of failed philosophies. Those failures not only motivate his refounding, but give it shape. Method's first concern is the second-order problem, not of what is, but of how we know what is. Method's prescriptions are given direction by the critique of the ancients' failed attempts rather than some new, privileged access to what is. Its rules for the direction of the mind are shaped more by Bacon's insights into philosophy's failures—and into our own ignorance—than any insight into the nature of nature, an insight which, on his own account, is impossible. Both the new science and the new idea of nature, which are simply different aspects of the same thought, are a kind of dialectical development of the old science and the old idea of nature. Thus Bacon's non-dialectical science is grounded in his dialectical engagement with the ancients. His

² I am deeply indebted to John McCarthy for these conclusions about Bacon's doubly mediated philosophy and more generally Bacon's relation to ancient philosophy. See especially John C. McCarthy, "The Good and the True in Early Modern Philosophy," 7: "That reflection is doubly dependent, in turn, on the perceived limits of prephilosophical reflection, and the allegedly deficient response of Socratic philosophy to those limits. It is, perhaps, not too much of a distortion to describe modern method philosophically conceived as a 'third sailing.'" That phrase becomes the title of his insightful essay, "Bacon's Third Sailing: The Presocratic Origins of Modern Philosophy."

true founding act is to reoccupy or recapitulate the old idea of nature and the philosophical attempt to know it.

The way Bacon's new science depends on the old science obscures the radical change he brought about. That science appeals to experience, but not to the ordinary experience of the statesman or the craftsman and not to the aporetic experience of the Socratic philosopher. Though science seems to be based on a direct experience of nature, the things themselves that Bacon's new science makes available to the initiates of the method are doubly mediated: the methodically controlled experience of the world is itself mediated by earlier attempts to give a philosophical account of the world. The *forms* or *laws* it seeks to know are likewise mediated by old answers to the questions nature puts to us, but are no longer the sort of principles Socrates or Aristotle tried to grasp. But because Bacon uses old words to describe the starting point and the objects of science, we focus on the route from experience to knowledge and lose track of Bacon's transformations of experience and the object of knowledge.

Though Bacon depends dialectically on Socratic philosophy, he is not, finally, a dialectical thinker. For he has managed (he believes) to escape the dialectical circle. It is not enough for his thoughts to agree with each other. He wants a non-hypothetical starting point that can ground non-hypothetical knowledge. Socratic *elenchus* is good at best for revealing what one doesn't know. The result is usually *aporia*. Any positive conclusion coming out of Socratic dialectic will have to be hypothetical, an opinion that, granting our starting point, is probably true. So Bacon makes a more comprehensive trial, not testing this opinion or that, but rejecting dialectical science altogether, including the assumptions about mind and nature which ground it. Instead of speeches, Bacon will put nature itself to the test. His science will be judged by its fruits. If it can reliably produce phenomena, it can justifiably claim to know.

That *elenchus* is Bacon's exclusive concern, and the outcome of his critique can be decisive for the rest of us. By translating his critique of the ancients into a prescriptive method, Bacon spares everyone else the need of returning to aporetic experience. Method provides a set of shared assumptions and a common measure that force being to show up in ways that are amenable to the mind's new machinery. Being is no longer aporetic or wondrous because method has decided in advance all the controversies that could arrest the progress of the sciences. That dogmatism makes possible a progressive science and allows non-philosophers to make a real contribution to the work of the mind. His dogmatic foundation can be vindicated if nature's answers to science's leading questions yield the useful discoveries he promises. Because Bacon's science has yielded much fruit, we become more confident that it was only our own Idols that made nature look perplexing, that nature's mysteries are in principle solvable and its powers controllable if we use the right method, work together, and give ourselves enough time. With every new victory over nature, it becomes easier to forget the dogmatism on which our nature-mastering science is founded.

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