

Francis
BACON

GREAT THINKERS

DAVID C. INNES
Foreword by Calvin L. Troup

“Historians of culture and of science know Francis Bacon as a key figure in the transition from the medieval to the modern period. Many idealize (or even idolize) him, and some demonize him, generally for the same thing—his philosophy of science that has become dominant in the English-speaking world (ostensibly a Christian approach to science). Here Dr. Innes provides us with a study of the man’s own writings that shows both appreciation and incisive critique; he especially helps us to see how Bacon’s approach—whatever positive things we may say about it—contributed to the secularization of the Western world, and thus to its dehumanization. He also opens the way for a more genuinely Christian and humane philosophy of science. For all this I thank Dr. Innes!”

—**C. John Collins**, Professor of Old Testament, Covenant Theological Seminary; author, *The God of Miracles: An Exegetical Examination of God’s Action in the World and Science and Faith: Friends or Foes?*

“*Francis Bacon* is an excellent brief introduction to Bacon’s revolutionary project. David Innes gets it: Bacon’s innovative experimentalism; a new hope for worldly progress dissembled under a pseudo-Christianity; a ‘total reconstruction’ of knowing and arts extending to morals, politics, and especially religion. Innes chronicles all this in short and lively sentences peppered with original observations and conveying serious scholarship. He addresses the contemporary underestimation of Bacon, entertains alternative views (while overawed by none), acknowledges obvious benefits of modern science, and corrects the prevailing translations. Besides, Innes is seriously moral and devout. He raises difficulties with the value-relativism of scientism and the distractions and temptations of the technological outlook—difficulties that beset us all.”

—**Robert K. Faulkner**, Research Professor, Boston College; author, *Francis Bacon and the Project of Progress*

“David C. Innes gives an insightful analysis of the sixteenth-century thinker Francis Bacon, whose vision was foundational to the rise of empirical science and technology. Indeed, Baconianism has become part of the very intellectual air we breathe, which is why it is crucial for Christians to think critically about Bacon’s influence—both on Western culture and on our own thinking. Innes skillfully disentangles the elements in Bacon’s thought that are compatible with biblical truth (he did, after all, work within a largely Christian intellectual milieu) from the elements that are contrary to biblical truth, and therefore destructive both personally and socially. That is not an easy job because Bacon often obfuscates to hide his more secular ideas from the uninitiated. Innes is a reliable guide, and this book will be especially helpful to readers concerned about how science and technology have shaped the modern worldview.”

—**Nancy R. Pearcey**, Professor of Apologetics and Scholar-in-Residence, Houston Baptist University; author, *Total Truth: Liberating Christianity from Its Cultural Captivity*; coauthor, *The Soul of Science: Christian Faith and Natural Philosophy*

“Francis Bacon is a key figure in introducing a new way of thinking about the world, at the heart of which is optimistic reliance on scientific method. David Innes has given us a nuanced, thoughtful, and critical introduction to Francis Bacon, in his life and thought. His book moves from Bacon’s views to assess the larger issues about science and its dominating role in modern aspirations for knowledge, power, and happiness. I heartily recommend the book as a path for rethinking the role of science from a Christian point of view.”

—**Vern S. Poythress**, Professor of New Testament, Westminster Theological Seminary; author, *Redeeming Science: A God-Centered Approach*

“Fascinating study of the controversial role played by Francis Bacon in fashioning the worldview of modern science. While keenly appreciating the many benefits of science and technology, Innes probes the darker side of Bacon’s thought that helped give rise to a scientific enterprise largely unbound by moral restraint. Subtle, provocative, and exquisitely relevant to our current culture.”

—**John G. West**, Vice President, Discovery Institute; editor,
The Magician’s Twin: C. S. Lewis on Science, Scientism, and Society; author, *Darwin Day in America: How Our Politics and Culture Have Been Dehumanized in the Name of Science*

“More than merely ‘the herald of modern philosophy,’ as some have dubbed him, Francis Bacon was really the chief architect of modernism, with its scientism and resultant technological society. David Innes reveals how this is so in a clear and compelling way in his new volume on Bacon in P&R’s Great Thinkers series. Innes notes in the very first paragraph of his work that ‘we live in Bacon’s world. He planned it all, and we participate unwittingly in his grand project.’ Thus he motivates this insightful exploration and critique of Bacon’s great project of reconstructing all learning and society on the foundation of his new empirical scientific methodology. As the exploration unfolds, we discover underneath the veneer of Christianity in Bacon’s work the subtle but potent subversion and domestication of Christianity to serve the purposes of Bacon’s very this-worldly vision. Innes proves to be an excellent guide, charitably appreciative of the good and true in Bacon’s work and at the same time incisive in his criticism of what is in fact inimical to the Christian faith. He connects the dots to our own time, showing how the world in which we live today has been significantly shaped by Bacon’s original vision. He drills down to Bacon’s presuppositions, exposing the source of Bacon’s subversive project. And he gives wise advice for faithful

Christian engagement with Bacon's thought and its influence in our society, including a blueprint for developing a godly science. This book will be a blessing to both the church and the academy in the world of Bacon's grand project. I highly recommend it to all who long for the advancement of the kingdom of God."

—**John Wingard**, Professor of Philosophy and Dean of Humanities, Covenant College

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BACON

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Francis
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—Queen Elizabeth’s Christmas Broadcast, 1952

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—Barack H. Obama’s First Inaugural

Address, January 20, 2009

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To my father, Leslie G. Innes, the scientist, the master of psychology from King's College, Aberdeen, the model of Scottish enlightenment, whose unconscious example and bejeweled library made serious university study of human things the obvious course for me.

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SERIES INTRODUCTION

Amid the rise and fall of nations and civilizations, the influence of a few great minds has been profound. Some of these remain relatively obscure, even as their thought shapes our world; others have become household names. As we engage our cultural and social contexts as ambassadors and witnesses for Christ, we must identify and test against the Word those thinkers who have so singularly formed the present age.

The Great Thinkers series is designed to meet the need for critically assessing the seminal thoughts of these thinkers. Great Thinkers hosts a colorful roster of authors analyzing primary source material against a background of historical contextual issues, and providing rich theological assessment and response from a Reformed perspective.

Each author was invited to meet a threefold goal, so that each Great Thinkers volume is, first, *academically informed*. The brevity of Great Thinkers volumes sets a premium on each author's command of the subject matter and on the secondary discussions that have shaped each thinker's influence. Our authors identify the most influential features of their thinkers'

work and address them with precision and insight. Second, the series maintains a high standard of *biblical and theological faithfulness*. Each volume stands on an epistemic commitment to “the whole counsel of God” (Acts 20:27), and is thereby equipped for fruitful critical engagement. Finally, Great Thinkers texts are *accessible*, not burdened with jargon or unnecessarily difficult vocabulary. The goal is to inform and equip the reader as effectively as possible through clear writing, relevant analysis, and incisive, constructive critique. My hope is that this series will distinguish itself by striking with biblical faithfulness and the riches of the Reformed tradition at the central nerves of culture, cultural history, and intellectual heritage.

Bryce Craig, president of P&R Publishing, deserves hearty thanks for his initiative and encouragement in setting the series in motion and seeing it through. Many thanks as well to P&R’s director of academic development, John Hughes, who has assumed, with cool efficiency, nearly every role on the production side of each volume. The Rev. Mark Moser carried much of the burden in the initial design of the series, acquisitions, and editing of the first several volumes. And the expert participation of Amanda Martin, P&R’s editorial director, was essential at every turn. I have long admired P&R Publishing’s commitment, steadfast now for over eighty-five years, to publishing excellent books promoting biblical understanding and cultural awareness, especially in the area of Christian apologetics. Sincere thanks to P&R, to these fine brothers and sisters, and to several others not mentioned here for the opportunity to serve as editor of the Great Thinkers series.

Nathan D. Shannon
Seoul, Korea

FOREWORD

Practical wisdom, combining learning and common sense, demands an understanding of our own times, so that, like the sons of Issachar, we might know what to do. However, we cannot understand our times by looking on the surface. Current events, trends, data analysis, and innovation cannot help us navigate life in the world today. Learning to make sense of the times into which we have been called requires studying an unfamiliar past while attending to the ends—the purpose, meaning, and state of being of our lives and of life itself.

In this volume, Professor Innes opens the way for us to begin to glimpse Sir Francis Bacon’s view of the world, in which he commends the “scientific” method—solving temporal, material problems through applied technology. Bacon’s practical aims have reordered our times—by common consent and without objection—effectively to negate serious attention to our past and efficiently to bypass consideration of the established ends of human life, community, and society. In short, Bacon replaced wisdom and virtue with methods and techniques.

Bacon’s design has improved real material conditions across

the globe, but it has failed in a profound way. While he succeeded in improving our circumstances, Bacon failed to improve the human condition—and this failure of Bacon’s project is just as real and practical as its visible successes. Albert Borgmann calls the empty results of material prosperity fueled by technology “advanced poverty.” We feel such poverty in searching anxiety, pressurized depression, and mounting forms of personal emptiness.

In this short book, Innes provides us with an unvarnished look at Bacon’s design—a design we see in the methods and techniques that have fashioned our times. Innes presents parameters for deeper understanding of Bacon’s work. His work invites us into further study of a sort that delivers keen insight into our own times in ways that are not available through current media sources.

Marshall McLuhan grounded his account of the emergence of electronic media and their effects on the human condition in the words of Psalm 115:

Their idols are silver and gold,
the work of human hands.
They have mouths, but do not speak;
eyes, but do not see.
They have ears, but do not hear;
noses, but do not smell.
They have hands, but do not feel;
feet, but do not walk;
and they do not make a sound in their throat.
Those who make them become like them;
so do all who trust in them.

Bacon’s design has shifted the attention and energy of the modern world decisively to trust the work of human hands. We can

observe and experience the consequences in our times. As Innes traces for us here, studying Francis Bacon exposes the spirit of our own age and bids us to place our trust elsewhere, in the one who “made the heavens and the earth” and who “does all he pleases.”

Calvin L. Troup
President and Professor of Communication
Geneva College

PREFACE

The standard collection of Bacon's works is the London edition of *The Works of Francis Bacon*, edited by Spedding, Ellis, and Heath. References to this source will be footnoted as *Works* followed by volume and page number (e.g., *Works* V:421). However, this is inaccessible for most readers, who should have a reasonable hope of looking up references for further investigation. I have, therefore, where possible, cited works that are commonly available.

I refer to *The Great Instauration* by page number in the inexpensive and freely available Hackett collection, *Selected Philosophical Works*, edited by Rose-Mary Sargent (e.g., *GI* 66). I refer to *The New Organon*, also available in the Hackett volume, by Bacon's book and aphorism numbers (e.g., *NO* I.129). Sargent uses the traditional Spedding translation with minor adjustments that she has judged to be helpful for twenty-first-century readers. Where I do not find her changes helpful, I reverse them. I refer to writings in the inexpensive and freely available Oxford World's Classics, *The Major Works*, edited by Brian Vickers (e.g., *MW* 20), but I cite *The Advancement of*

Learning and *New Atlantis* by page numbers in *The Major Works* if the work is named in the body of the text, and by abbreviated name and page number otherwise (e.g., *AL* 147 or *NA* 457). I refer to Bacon's *Essays* simply by essay number (e.g., Essay No. 6). *Thoughts and Conclusions* and *The Masculine Birth of Time* are found only in Benjamin Farrington's book, *The Philosophy of Francis Bacon* (Chicago: University of Chicago Press, 1966) and will be cited as *TC* or *MBT*, respectively, followed by the page number in Farrington (e.g., *TC* 77). For ease of readability, if there are multiple references, they will appear in a footnote.

Sadly, a reliable translation of Bacon's Latin works is not available. For example, Spedding uses "power" to translate *potentiae*, but renders *amplitudinis* as "power" in one place and "greatness" in another, despite the importance of the concept of power in Bacon's thought. This is a frustrating impediment to the serious student of Bacon's thought who relies on a translator. Equally unhelpful is Spedding's rendering of *Instauratio* simply as such in the title and in one other place, but as "reconstruction" in a highly significant passage ("total reconstruction of sciences") without so much as a footnote—which is astonishing, especially since Bacon's *Works* is intended for scholars. Basil Montague's translation has its own problems, and that of Lisa Jardine and Michael Silverthorne is highly interpretive.

I am deeply indebted to Prof. James C. Morrison of St Michael's College, University of Toronto, for introducing me to the importance of Francis Bacon in our modern world, as well as to Prof. Robert K. Faulkner, my dissertation advisor at Boston College, a wise and judicious scholar.

I am grateful to Timothy Burns at *Interpretation: A Journal of Political Philosophy* for permission to draw heavily from my 1994 article "Bacon's *New Atlantis*: The Christian Hope and the Modern Hope," as well as to the good people at Catholic University Press for generous use of my 2010 chapter "Civil

Religion as Political Technology in Bacon’s *New Atlantis*,” in Weed and von Heyking’s *Civil Religion in Political Thought*.

I thank Discovery Institute’s Center for Science and Culture for generously funding my participation in the 2018 C. S. Lewis Fellows Program. Thanks to Nathan Shannon for agreeing to include Francis Bacon in the Great Thinkers series and allowing me to write the volume. Thanks to The King’s College for the generous supply of books they funded for my study in writing this book. Joshua Hershey, my colleague, not only reviewed my manuscript, but did so with joy and enthusiasm at a busy time of year—because that’s who he is. Thanks to A. Edward Major for his consultations on the details of ancient English law and government, to my faculty assistants, Aidan Gauthier and Edward Wilson, for their work in proofreading, to my wife, Jessica, for her suggestions for greater readability, and to my son David and my daughter Eowyn, who supplied me with coffee, refills, and Sous Vide Egg Bites at our local Starbucks as I wrote without distraction.

INTRODUCTION

Why should a thoughtful, modern reader care about Francis Bacon (1561–1626)? The most pressing reason is that we live in Bacon’s world. He planned it all, and we participate unwittingly in his grand project. The American pragmatist John Dewey wrote, “Francis Bacon of the Elizabethan Age is the great fore-runner of the spirit of modern life . . . the real founder of modern thought.”¹ “Modern man,” writes Howard White, one of Bacon’s most sober interpreters, “is essentially a Baconian.”² In studying Francis Bacon, we are studying what makes the modern world and us as modern people modern. It is, therefore, an exercise in genealogical research, autobiographical reflection, and intellectual and spiritual self-assessment.

Bacon is arguably the father of modern science, but perhaps the reader is not interested in science. In our modern world, however, science touches everything, shapes everything, tells

1. John Dewey, *Reconstruction in Philosophy* (1920; repr., Boston: Beacon, 1948), 28.

2. Howard B. White, *Peace among the Willows: The Political Philosophy of Francis Bacon* (The Hague: Martinus Nijhoff, 1968), 10.

everything what it is and what it may aspire to become. Science is no longer just a part of life, but has become the whole of life—as Bacon claimed it ought to be. It is widely accepted in our day, and has been for some time, that to know something as true, one must have the facts, data, measurable and quantifiable observations, and these analyzed scientifically. This is scientism, the exclusivity of natural science as a way of knowing. It is premised on philosophical naturalism and is a form of radical empiricism, materialism, and what Auguste Comte later formulated as positivism. It is what Bacon has bequeathed to us, and we embrace it religiously.

The focus of this book is where Bacon himself placed it: his central project and grand ambition for our conquest of nature. He called this his Great Instauration, “a total reconstruction (*instauratio*) of sciences, arts, and all human knowledge, raised upon the proper foundations” (GI 66), so that “there may spring helps to man, and a line and race of inventions that may in some degree subdue and overcome the necessities and miseries of humanity” (GI 80). This is, he said, “the real business and fortunes of the human race” (GI 84). Great hopes for the future were opening up during the Renaissance, inspired by advances in learning, exploration, prosperity, and invention. These inventions were, to be sure, few and haphazard, but they stirred interest in a widening sphere of human possibilities. It took Francis Bacon, however, to show the way to discover nature’s closely guarded secrets and, applying them, to open the way for “whole troops of works.”³

These inventions and works are what we now call technology. Technology is not just cool things that make life better: easier, safer, more efficient, more exciting. Technology, technological thinking, and technological culture are inseparable from each

3. GI 81; cf. NO I.70, 121.

other and give us both the spirit of innovation and the religion of human autonomy, forward-looking hope, and backward-looking suspicion and disdain. Technological culture prefers the novel just for its novelty, is always pushing some envelope and proud to be shattering preconceived notions. This is “the spirit of modern life” of which Bacon was the architect and apostle.

But this project was a hard thing “to win faith and credit for” (*GI* 67). People’s hope was in Christ, his resurrection, and his eschatological kingdom, which, at the very least, considerably relieved the urgency of Bacon’s “kingdom of man, founded on the sciences” (*NO* I.68). It was part of his plan, therefore, to adapt Christianity as a vehicle for his new scientific civilization. Bacon’s project certainly seems Christian, and Bacon presents it that way, as simply an investigation of God’s works for “the glory of the Creator and the relief of man’s estate” (*AL* 147–48). But there are disturbing details that should lead us to question the Christian standing of his project and thus of “the spirit of modern life.” He substitutes the hope of technological science for the Christian hope. Bacon promised us a better blessing, an earthly one, a new continent of learning (*GI* 73) that was to be, by the nature of that learning, identical with a happy land of unprecedented comfort and security.

His promise has borne fruit, but like everything under the sun, it combines both felicity and vanity. Were it not for Bacon, there would be no antibiotics, no plastics, and no internet, but there would also be no atom bomb, no strip mining, and no internet. Insofar as Bacon’s hope is the systematic fulfillment of the creation mandate, it is a blessing. Insofar as it is simple domination of the world and thus of some people over others, it is a curse. Pursued exclusively on its own terms, there is no reason it should not culminate in Aldous Huxley’s World State in *Brave New World* (1936) or in the National Institute for Coordinated Experiments in C. S. Lewis’s space trilogy (1938–45). J. B. S.

Haldane, a prominent British evolutionary biologist, Baconian to his bones, whose thought is said to have been the dystopian inspiration for both Huxley and Lewis, celebrated “man’s gradual conquest, first of space and time, then of matter as such, then of his own body and of other living beings, and finally the subjugation of the dark and evil elements of his own soul.”⁴ (How he derived his notions of “dark and evil,” light and good, is anyone’s guess.) Bacon was aware of the frightening downside, but thought it worth undertaking just the same, if only for his own posthumous glory.

None of this should be taken to suggest invalidating or disparaging experimental science and its industrial application. Insofar as it is good, it is from God, an obedience to his creation mandate and an explication of “the book of his works,” as Bacon put it. As such, it must have biblical foundations. But to be established more firmly on those foundations, the original grounds and their presuppositions—even their overtly stated ones—require fresh examination. Bacon is eloquent on these matters, though also at times artfully elusive. But that just makes it fun.

4. From *Daedalus, or Science and the Future* (1923), quoted in John G. West, “The Magician’s Twin,” in *The Magician’s Twin: C. S. Lewis on Science, Scientism, and Society*, ed. John G. West (Seattle: Discovery Institute Press, 2012), 30.

ABBREVIATIONS

- AL *The Advancement of Learning*, in *The Major Works*, ed. Brian Vickers (New York: Oxford University Press, 2002)
- GI *The Great Instauration*, in *Selected Philosophical Works*, ed. Rose-Mary Sargent (Indianapolis: Hackett Publishing Company, 1999)
- MBT *The Masculine Birth of Time*, in *The Philosophy of Francis Bacon*, by Benjamin Farrington (Chicago: University of Chicago Press, 1966)
- MW *The Major Works*, ed. Brian Vickers (New York: Oxford University Press, 2002)
- NA *New Atlantis*, in *The Major Works*, ed. Brian Vickers (New York: Oxford University Press, 2002)
- NO *The New Organon*, in *Selected Philosophical Works*, ed. Rose-Mary Sargent (Indianapolis: Hackett Publishing Company, 1999)

- TC *Thoughts and Conclusions*, in *The Philosophy of Francis Bacon*, by Benjamin Farrington (Chicago: University of Chicago Press, 1966)
- Works *The Works of Francis Bacon*, ed. James Spedding, Robert Leslie Ellis, and Douglas Denon Heath (London: Longmans and Co., 1870)

1

BACON'S HEROIC AMBITION

Francis Bacon, by any measure, is one of the “great thinkers” of the human race. These are, by God’s grace, the great masters of that uniquely human faculty—the mind—in its relation to comprehending God, man, and the universe.

Not everyone occupied with ideas is engaged in the same enterprise. Many of these in every direction are mere *idea manipulators*—chattering academics, poseurs, and widely read diletantes who trade in ideas to fill their pockets and chalk their names on walls of honor. Many others, by contrast, whom we may call *idea mediators*, faithfully curate and elaborate the traditions of thought as fruitful fields of study in support of wisely lived lives—truth-driven scholars and faithful, studious teachers and pastors, even learned artists and poets. *Idea masters*, however, are few. They think within a tradition, brilliantly following its trajectory and developing its logical, metaphysical, and moral implications. But fewer still and rare are the *idea monarchs*, great founders of the highest ambition, who recast and govern whole civilizations by an empire of the mind. Francis Bacon—the father of modern science as a rigorous way of understanding all

things and of bringing all things under human control—aspired to be, and is, such a ruler. The question whether his government is wise is a matter of contentious debate. It is a debate over modernity itself.

Bacon stated his great and comprehensive ambitions in a letter to his uncle, Lord Burghley, in 1592 at the mature age of 31: “I confess that I have as vast contemplative ends, as I have moderate civil ends: for I have taken all knowledge to be my province.” He underscored the centrality of this intellectual preoccupation: “This, whether it be curiosity, or vain-glory, or nature, or (if one take it favourably) *philanthropia*, is so fixed in my mind as it cannot be removed” (MW 20). Many years later, in the proemium to *The Great Instauration*, the introduction to his broad project, he restates his purpose: “to commence a total reconstruction of sciences, arts, and all human knowledge, raised upon the proper foundations” (66). By this refounding and rebuilding of our mental universe, Bacon would reorient all human beings to all things, even to God himself. To his uncle, he allowed that his motive in this could be intellectual curiosity, personal vainglory, or just the controlling impulse of a contemplative nature. The reader should note from the start that Bacon was silent on love for God and allowed only for philanthropy as a generous view that one could take of his aim. In his 1605 work, *The Advancement of Learning*, he writes that what we should seek from knowledge and what we should expect from the progress of its advancement is “a rich storehouse for the glory of the Creator and the relief of man’s estate” (AL 147–48). Although Bacon couples God’s glory with man’s comfort, the main thrust of his rhetoric is the hope of human betterment, to which he appeals for enlisting the best minds and the broad public in this new orientation to the world.

The World as It Was

It is difficult for us to appreciate, from the cushion of our modern comfort, the precarious condition of daily life that almost everyone suffered for most of human history. This was “man’s estate” that Bacon had in mind when he announced his comprehensive philosophical project that would bring us “relief.” The aged Jacob lamented to Pharaoh in Egypt, “Few and evil have the days of the years of my life been” (Gen. 47:9 kJV). His sojourn was not unusual, and nothing changed for millennia to come. Job noted that we are “few of days and full of trouble” (Job 14:1). No one would dispute the teacher in Ecclesiastes, who wrote, “What has a man from all the toil and striving of heart with which he toils beneath the sun? For all his days are full of sorrow, and his work is a vexation” (Eccl. 2:22–23).

The fourth horseman of the Apocalypse on his ashen steed, bringing sword, famine, and plague, has cut through human society with dread regularity until very recently (Rev. 6:8). These three evils are, of course, interrelated. Famine and war produced conditions that made especially the poor and those crowded into cities susceptible to disease. One can get a telling picture of the brevity, uncertainty, and cruelty of ordinary, pre-modern life by contrasting the Black Death of the fourteenth century (arguably the greatest public health disaster the world has ever seen) and the miseries of the roughly two hundred years following Bacon’s life with the twentieth-century advances in human betterment.¹

1. In my accounts, I rely on Barbara W. Tuchman, *A Distant Mirror: The Calamitous 14th Century* (New York: Ballantine Books, 1978); Tim Blanning, *The Pursuit of Glory: The Five Revolutions That Made Modern Europe: 1648–1815* (New York: Penguin, 2007); Deirdre McCloskey, *Bourgeois Equality: How Ideas, Not Capital or Institutions, Enriched the World* (Chicago: University of Chicago Press, 2016); and Steven Pinker, *Enlightenment Now: The Case for Reason, Science, Humanism, and Progress* (New York: Viking, 2018).

Famine

Historically, most people have spent their time and energy, like birds and squirrels, securing sufficient food to sustain themselves and their families in life. People lived in continual fear of a failed harvest and a consequent famine. Poor growing conditions from either too much or not enough rain, or from blight, meant starvation for many who were already living at or near subsistence. Grains for seed, cattle, and human consumption had to be grown within just a few miles of where people lived, because a wider distribution network was economically unfeasible or technologically impossible.²

So famine was a common horror. “In the European Middle Ages a killing famine in the favored south of England came every ten years or so.”³ A famine in France that lasted from 1692 to 1694 claimed 2.8 million people, 15 percent of the population. Famine killed a third of the people in Finland between 1696 and 1697.⁴ A Dutch merchant recounted what he witnessed during a famine in India in 1630–31.

Men abandoned towns and villages and wandered helplessly. It was easy to recognize their condition: eyes sunk deep in the head, lips pale and covered with slime, the skin hard, with the bones showing through, the belly nothing but a pouch hanging down empty. . . . The whole country was covered with corpses lying unburied.⁵

The last killing famine in England was in 1623. On the continent, France and Germany saw their last one in the eighteenth century, and poor Spain suffered Europe’s final famine in

2. Blanning, *The Pursuit of Glory*, 50.

3. McCloskey, *Bourgeois Equality*, 23.

4. Blanning, *The Pursuit of Glory*, 52.

5. Quoted in Pinker, *Enlightenment Now*, 69.

1905.⁶ Modern shipping and rail opened Europe to the vast productive plains of the New World and helped turn famine into a history lesson. Mechanization from the industrial revolution that began in late eighteenth-century England radically transformed human productivity and well-being. “In the mid-19th century it took twenty-five men a full day to harvest and thresh a ton of grain; today one person operating a combine harvester can do it in six minutes.”⁷ Industrial-scale fertilizer from nitrogen in 1909 multiplied yields while slashing the cost of produce.⁸ Cooler cars of iceberg lettuce made their first cross-country trip in 1919, turning California farms into America’s back garden. Norman Borlaug’s Green Revolution in the 1960s turned “lands of famine” like India into grain exporters by engineering wheat, corn, and rice to produce many times more on the same acre of land. In 1947, half the world was malnourished, with consequences for sickness, education, and prosperity. Today, that figure is 13 percent for the developing world alone. Famine is now isolated in the horn of Africa, and has more to do with bad government than bad climate.⁹ That is the edible dimension of the technological revolution, of Bacon’s dreams and calculations.

Disease

Malnutrition left people especially susceptible to disease. While deadly disease was common, and plague would visit from time to time, the great plague of biblical proportions was the Black Death of 1347–51. People thought it was the end of the world. Why wouldn’t they?

This cloud of death came from the east—India, Crimea, and the Levant—and entered Europe by the ports of Messina

6. McCloskey, *Bourgeois Equality*, 23.

7. Pinker, *Enlightenment Now*, 75.

8. Ibid.

9. Ibid., 78.

and Marseilles. From there it spread from Iceland in the west to Russia in the east. Death was hideous, tortuous, and certain. First came “shivering, vomiting, acute headache and pain in the limbs,” followed soon by “strange black swellings about the size of an egg or an apple in the armpits and groin. The swellings oozed blood and pus and were followed by spreading boils and black blotches on the skin from internal bleeding.” Along with this, “everything that issued from the body—breath, sweat, blood from the buboes and lungs, bloody urine, and blood-blackened excrement—smelled foul.”¹⁰ The contagion was spread by rats and fleas and between humans by contact and breath.

Anywhere from one-third to two-thirds of every major city in Europe fell victim. Half of Paris perished and half of Avignon; Florence lost three- to fourth-fifths and Venice two-thirds. The sick were “dying too fast for the living to bury.” Whole villages were emptied, their humble structures then swallowed back into the earth. Fields lay unattended, not only from the death of owner and laborer alike, but from a general despair about the future. Why plough and plant when the only reaper is death?¹¹

The seventeenth century, the hundred years following Bacon’s call to war on nature, was a public health disaster. Spain’s population fell from 8.5 to 7 million, devastated by bubonic plague, typhus, and smallpox. The Great Plague of London in 1665 killed up to 100,000 of the 500,000 residents. Naples lost half its population in 1656, and Genoa 60 percent.¹² The eighteenth century was no better. It was part of the rhythm of life for a host of diseases to cut through the population from the least to the greatest: influenza, typhus, dysentery, scarlet fever. But “the great killer of the eighteenth century,” Blanning tells us, “was smallpox,” which in Europe killed roughly 400,000 people

10. Blanning, *The Pursuit of Glory*, 58; Tuchman, *A Distant Mirror*, 92.

11. Tuchman, *A Distant Mirror*, 94–95, 99.

12. Blanning, *The Pursuit of Glory*, 57, 59.

per year.¹³ In the twentieth century, it killed 300 million before it was completely eradicated in 1977.¹⁴

Of course, there was medicine in and around Bacon's time, but it was based largely on astrology and maintaining a balance among the body's four humors: blood, black bile, yellow or red bile, and phlegm. A physician would restore health by draining off one or another of these by various purgatives or by bleeding, hence the common use of leeches to treat maladies.¹⁵ Tuchman notes that "medicine was the one aspect of Medieval life, perhaps because of its links with the Arabs, not shaped by Christian doctrine." Even highly respected papal physicians based their diagnoses and prescriptions partly on the movement of the sun, moon, and planets. In 1348, the University of Paris medical faculty located the cause of the Black Death in "a triple conjunction of Saturn, Jupiter, and Mars in the 40th degree of Aquarius" in 1345, a judgment that was universally accepted among the learned.¹⁶

They had no idea of epidemiology. The living would carry out the dead, dwell amongst their piled, stinking corpses, and wear their discarded clothes. The bubonic plague was thought to be spread by beams of light darting from the eyes.¹⁷ Folk remedies for common ailments and diseases were far more likely to help than anything from the medical art, which was likely only to make things worse. So Bacon remarked, "Empirics and old women are more happy many times in their cures than learned physicians" (AL 213), and Thomas Hobbes, we are told, "was wont to say, that he had rather have the advice, or take Physique from an experienced old Woman, that had been at many sick

13. Ibid., 62–63.

14. Pinker, *Enlightenment Now*, 64–65.

15. Blanning, *The Pursuit of Glory*, 66.

16. Tuchman, *A Distant Mirror*, 102–3.

17. Ibid., 102.

people's Bedsides, then from the learnedest but unexperienced Physitian."¹⁸

It follows that sanitation was appalling. In the century of Bacon's birth, people of the lower sort crowded into cities, uncomprehending in their filth and in close society with rats, lice, and fleas. "Before the 20th century, cities were piled high in excrement, their rivers and lakes viscous with waste, and their residents drinking and washing their clothes in putrid brown liquid."¹⁹ Where people congregated

was a habitat of . . . narrow, airless, filth-ridden streets and passages; of hovels and grand houses without ventilation; of the dead incompletely isolated from the living. . . . We must pause for a moment to try to recapture these scenes . . . of refuse and waste strewn here and there that filled the eyes of the seventeenth-century European.²⁰

It is a wonder that anyone survived.

Indeed, historically, average life expectancy has been consistently low, hovering until recently around thirty years of age. There were old people, of course. The Bible refers to a life span as threescore and ten. But high infant mortality rates dragged the average down precipitously. After that, life's usual predators—famine, disease, and war—took their toll.

But much changed when the Baconian view of nature and of reason's purpose in dissecting, measuring, and conquering nature became broadly accepted and rigorously applied. We hit what Dierdre McCloskey calls "the blade of the hockey stick," a period

18. John Aubrey, *Brief Lives*, ed. John Buchanan-Brown (London: Penguin, 2000), 442.

19. Pinker, *Enlightenment Now*, 63.

20. James Riley, *The Eighteenth-Century Campaign to Avoid Disease* (New York: Palgrave Macmillan, 1987), x–xi, quoted in part in Blanning, *The Pursuit of Glory*, 59.

of astonishing worldwide improvement in the conditions of life that she calls “the Great Enrichment.”²¹ Steven Pinker reports that “a British baby who had survived the hazardous first year of life would have lived to 47 in 1845, 57 in 1905, 72 in 1955, and 81 in 2011.” Today, having conquered diseases like polio and smallpox, and having introduced antibiotics, antisepsis, pest control, vaccination, chlorinated water, industrial fertilizer, and crop rotation, global life expectancy—global, mind you!—is 71.²² Winston Churchill reflected on the astonishing pace of progress in “the fuller life of man” that science had generated.

In the methods of production and communication, in the modes of getting food and exchanging goods, there was less change between the time of Sargon and the time of Louis XIV than there has been between the accession of Queen Victoria and the present day. Darius could probably send a message from Susa to Sardis faster than Philip II could transmit an order from Madrid to Brussels. Sir Robert Peel, summoned in 1841 from Rome to form a government in London, took the same time as the Emperor Vespasian when he had to hasten to his province of Britain. The bathrooms of the palaces of Minos were superior to those of Versailles. A priest from Thebes would probably have felt more at home at the Council of Trent two thousand years after Thebes had vanished than Sir Isaac Newton at a modern undergraduate physical society, or George Stephenson in the Institute of Electrical Engineers. The changes have been so sudden and so gigantic that no period in history can be compared with the last century.²³

This is all precisely what Bacon foresaw for his project.

21. McCloskey, *Bourgeois Equality*, 24.

22. Pinker, *Enlightenment Now*, 59, 53.

23. Winston S. Churchill, “Fifty Years Hence,” in *Thoughts and Adventures* (1932; repr., New York: W. W. Norton, 1991), 193, 195.

Bacon's Plan to Change the World

In the beginning, God gave his human creatures his creation mandate to be fruitful, multiply, fill the earth, and exercise dominion over all things in his name, in his service and for his glory, executing his will out of love for him (Gen. 1:26–28). For this task, we were incapacitated by sin in the fall. Our service became self-seeking. Our rule became rebellion. Efforts at dominion became willful domination—not creative vice-regency, but usurpation and tyranny.²⁴ Nonetheless, our capacity for unfolding the possibilities within the creation remained—hence, the long history of many inventions in building, plumbing, textiles, agriculture, cookery, warfare, and so on.

After our fall into sin, God told Adam and Eve, “By the sweat of your face you shall eat bread” (Gen. 3:19). Paul tells us that the creation is “groaning,” and that the ultimate relief from suffering and death will come with the consummation of Christ’s redemption, at which time, and not before, there will be “no more death, nor sorrow, nor crying” (Rev. 21:4 NKJV). Yet, until then, his mercy is upon and throughout his creation. He makes the sun to shine on the just and the unjust alike. His goodness is not only in what we effortlessly receive, but also in what we cultivate from the creation as received, even for the wicked after the fall. We see this in the early chapters of Genesis, specifically in the children of Cain: the invention of agriculture, viticulture, metallurgy, music, poetry, and cities. God does this, not only out of his mercy and as a testimony to his gracious goodness, but also out of love for his people who benefit from these mercies.

Despite these mercies, pestilence and poverty haunted us like

24. For an expanded treatment of this point, see David C. Innes *Christ and the Kingdoms of Men: Foundation of Political Life*, chapter 1, “The Kingdom of God: The Theological Framework for Political Life” (Phillipsburg, NJ: P&R Publishing, 2019); 1–20.

merciless, devouring wolves. Life under the sun was unpredictable, fraught with dangers and difficulties, even for those who toiled faithfully in righteousness. The Preacher reflects: "I saw that under the sun the race is not to the swift, nor the battle to the strong, nor bread to the wise, nor riches to the intelligent, nor favor to those with knowledge, but time and chance happen to them all" (Eccl. 9:11). But with the success of his project, Bacon promised us relief from toil and the uncertainty of life.

Bacon states his plan for alleviating the miseries of our human condition in *The Great Instauration*,²⁵ the name he also gave to the project he presented in various works, some of which were never published. The heart of the plan is in the work's proemium: the conquest of nature for the empire of man over the universe. He opens with these words:

Being convinced that the human intellect makes its own difficulties, not using the true helps which are at man's disposal soberly and judiciously, whence it follows manifold ignorance of things, and by reason of that ignorance, innumerable mischiefs. (66)

In stating the problem, that "the human intellect makes its own difficulties," Bacon is saying nothing new. The human intellect has problems: the noetic effects of the fall, the effect of sin on the mind. For this reason, we have lost Adam's original ability to understand the creation. The wise are few, and there is little agreement on anything, even among the learned. Bacon tells us that the reason for these difficulties is not the irremediable nature of things, however, but the inexcusable sloth and negligence of the

25. Charles Whitney points out that the Vulgate Bible, Jerome's translation of the Bible from the original Hebrew and Greek into Latin, uses *instauratio* to indicate restoration as well as a new beginning (*Francis Bacon and Modernity* [New Haven: Yale University Press, 1986], 23).

mind itself—inexcusable because the true helps (by which he means the scientific method outlined in his writings) are at hand.

Bacon then states what he means by intellectual difficulties: the “ignorance of things” that results directly from this neglect of the proper method of inquiry, which in turn brings upon us *rerum detrimenta innumera*, “countless harmful things.” The difficulties are not for the mind only, but for the whole wretched human condition. Bacon accounts for these inexhaustible *rerum detrimenta*, or human miseries in general, by our ignorance of “things” perpetuated through this negligence. The remedy is humanly available and near at hand. Bacon’s proposal for a new science will right all that is wrong, or at least alleviate the misery.

The traditional Christian teaching on the cause of human misery, however, even regarding the mind alone, is that it stems from the fallen character, not only of man, but of the whole creation. Human misery and the troublesome relationship of man to the rest of creation, whether intellectually or otherwise, is fundamentally but not exclusively a spiritual problem. The remedy must, therefore, be ultimately spiritual, and it is provided in the redemptive work of Jesus Christ. We have the God-given ability to improve our condition—everything from the toil of ploughing and harvesting to the mastery of Jubal’s lyre—but every attempt to ground happiness in human works is vain and idolatrous.

Yet Bacon identifies the broadest conception of our difficulties—“innumerable”—as stemming, not from human sin, but from the “ignorance of things.” Our ignorance, he says, is specifically regarding the internal operation of things, ignorance that results from “not using the true helps which are at man’s disposal,” namely his new organon, the new logic and method of discovery. Stated otherwise, the human problem is not theological sin, but philosophical sin, proceeding from ignorance, rather than spiritual rebellion. Thus, all our hopes turn on the relationship, not between the soul and God, but between the mind and “things.”

Our salvation from the bondage of misery is found in the restoration of this relationship “to its perfect and original condition, or if that may not be, yet reduced to a better condition.” Although Bacon adds this qualifier so as not to appear to advocate attempting to reverse Adam’s curse or to remedy by human efforts the consequences of the fall, he has not made a direct, pious statement, as he could have made, but an impious statement followed by a pious correction.²⁶ The qualification “if that may not be” leaves open the possibility that the first, more extreme statement could be true. This helps that Bacon’s method will supply will restore to the mind the “true powers” God intended for it. But this requires a revolution in “the entire fabric of human reason,” the very process of human thought itself, with a view to discovering truth. As the foundation is wrong, so too is everything we build upon it. Our whole way of thinking about nature is poorly constructed and must be rebuilt from the ground up. This will deliver us from life’s “innumerable mischiefs,” the many ills that beset the human race, even those for the resolution of which people have traditionally looked to God.

This project, he says, is a hard thing “to win faith and credit for” (*GI* 67), but it is “that one path which alone is open to the human mind.” He elaborates:

And certainly the two ways of contemplation are much like those two ways of action, so much celebrated, in this; that the one, arduous and difficult in the beginning, leads out at last into the open country, while the other, seeming at first sight easy and free from obstruction, leads to pathless and precipitous places.

26. This is preceded by a similar impiety, which is, in turn, followed by a pious correction, namely that there is nothing on earth that compares to the commerce between the mind and things in this regard, or at least nothing “that is of the earth,” pulling back from slighting the ministry of Christ’s church, for example.

Here he invokes the familiar gospel teaching regarding the two ways:

Enter by the narrow gate. For the gate is wide and the way is easy that leads to destruction, and those who enter by it are many. For the gate is narrow and the way is hard that leads to life, and those who find it are few. (Matt. 7:13–14)

But in the Sermon on the Mount, Jesus is not speaking of action alone, but of whole ways of life and the principles by which one orders one's life. He is speaking comprehensively. So too is Bacon. Though appearing to distinguish contemplation from action, theory from practice, he actually undermines the distinction. In *Thoughts and Conclusions*, he compares empirics to ants, which merely "gather and combine," and rationalists to spiders, which contribute solely from within themselves. As a model for philosophy, Bacon prefers the bee, which combines the two (TC 97). In this metaphor, reason cannot grasp eternal truths or guiding moral principles, but is solely production-oriented. This subordination of thinking to action is not limited to the realm of natural science. This new method or way of contemplation, "a better plan," constitutes "a total reconstruction of sciences, arts, and all human knowledge, raised upon the proper foundations" (GI 66). The new method of scientific inquiry is in fact a new logic for understanding everything and thus has revolutionary implications for how we think about, understand, and thus live every aspect of human life.

With the announcement of his project, "the great instauration of the dominion of man over the universe,"²⁷ Lord Verulam brings good news of great hope. If Jesus is the true path in the

27. This is how Bacon characterized his project in the subtitle to an early work, *The Masculine Birth of Time*.

Gospel according Matthew, this new science, Bacon intimates, is the world's true savior. While Jesus says, "I am the way, and the truth, and the life" (John 14:6), Bacon says of his method, "There are and can be only two ways of searching into and discovering truth. . . . This is the true way, but as yet untried" (*NO* I.19).