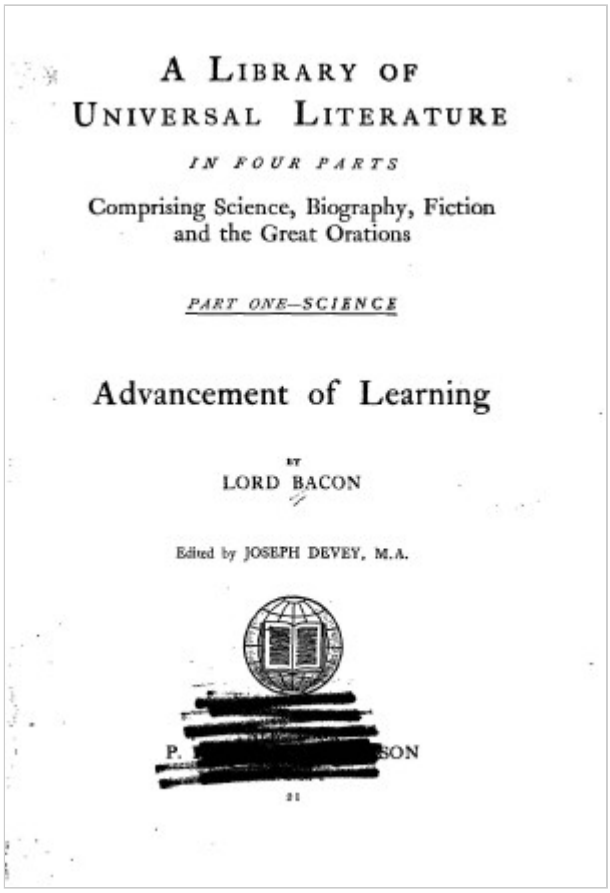
The Online Library of Liberty

A Project Of Liberty Fund, Inc.

Sir Francis Bacon, ***The Advancement of Learning*** [1605]

The Online Library Of Liberty


A LIBRARY OF
UNIVERSAL LITERATURE
IN FOUR PARTS
Comprising Science, Biography, Fiction
and the Great Orations
PART ONE—SCIENCE
Advancement of Learning
BY
LORD BACON
Edited by JOSEPH DEVEY, M.A.

Edition Used:

The Advancement of Learning, by Lord Bacon, edited by Joseph Devey, M.A. (New York: P.F. Collier and Son, 1901).

Author: Sir Francis Bacon
Editor: Joseph Devey

About This Title:

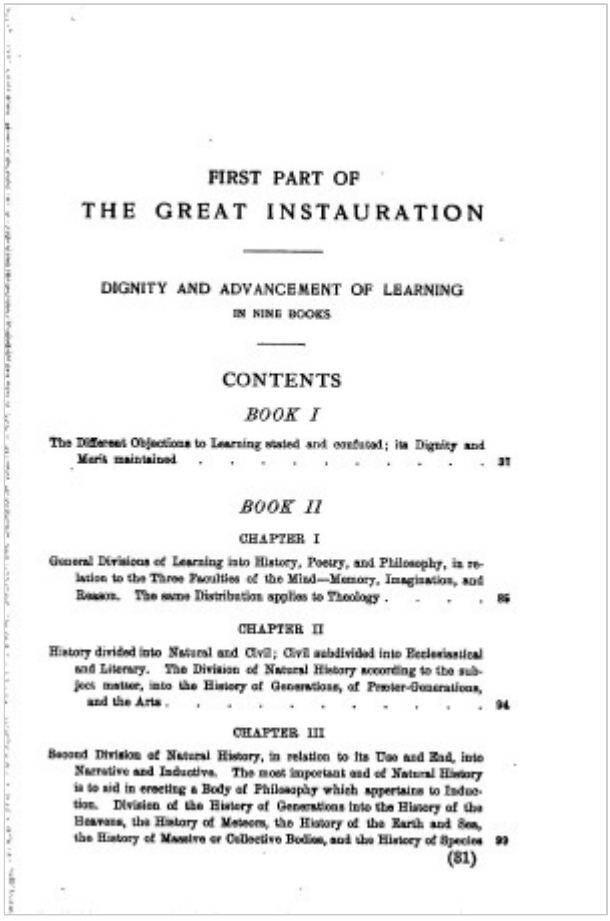
The first of Bacon's writings on the nature of science and the scientific method. He also had a view of the unity of knowledge, both scientific and non-scientific.

About Liberty Fund:

Liberty Fund, Inc. is a private, educational foundation established to encourage the study of the ideal of a society of free and responsible individuals.

Copyright Information:

Fair Use Statement:



FIRST PART OF

THE GREAT INSTAURATION

DIGNITY AND ADVANCEMENT OF LEARNING

IN NINE BOOKS

CONTENTS

BOOK I

BOOK II

(31)

Table Of Contents

SIR FRANCIS BACON

PRESS OF P. F. COLLIER & SON

[Back to Table of Contents]

BOARD OF EDITORS

SCIENCE

ANGELO HEILPRIN, author of "The Earth and Its Story," etc.; Curator Academy of Natural Sciences of Philadelphia.

JOSEPH TORREY, JR., Ph.D., Instructor in Chemistry in Harvard University.

RAY STANNARD BAKER, A.B., author of "The New Prosperity," etc.; Associate Editor of McClure's Magazine.

BIOGRAPHY

MAYO W. HAZELTINE, A.M., author of "Chats About Books," etc.; Literary Editor of the New York Sun.

JULIAN HAWTHORNE, author of "Nathaniel Hawthorne and His Wife," "History of the United States," etc.

CHARLES G. D. ROBERTS, A.B., A.M., author of "A History of Canada"; late Professor of English and French Literature, King's College.

FICTION

RICHARD HENRY STODDARD, author of "The King's Bell," etc.; Literary Editor of the New York Mail and Express.

HENRY VAN DYKE, D.D., LL.D., author of "Little Rivers," etc.; Professor of English Literature at Princeton University.

THOMAS NELSON PAGE, LL.D., Litt.D., author of "Red Rock," etc.

ORATIONS

HON. HENRY CABOT LODGE, A.B., LL.B., author of "Life of Daniel Webster," etc.; U. S. Senator from Massachusetts.

HON. JOHN R. PROCTOR, President U. S. Civil Service Commission.

MORRIS HICKEY MORGAN, Ph.D., LL.D., Professor in Latin, Harvard University.

FRANCIS BACON

Francis Bacon, one of the greatest names in English history, was born in London, January 22, 1561. He was the youngest son of Sir Nicholas Bacon, who for twenty years had held the seals as Lord Keeper. His mother was a daughter of Sir Anthony Cooke, and one of her sisters was married to the famous Lord Treasurer, Burghley, ancestor of the present Marquis of Salisbury. In 1573 he entered Trinity College, Cambridge, and resided there three years, after which he travelled for the same length of time upon the Continent. On the death of his father in 1579 he returned to England and began his life in comparative poverty. In 1582 he was admitted to the bar, and two years later secured a seat in Parliament. His advancement was slow, but he ultimately became King's Counsel, and in 1607 was made Solicitor-General. Six years later he became Attorney-General and in 1617 obtained the Great Seal with the title of Lord Keeper. In the following year he received the higher title of Lord Chancellor, and was made Baron Verulam; in 1621 he was created Viscount St. Albans. It is well known that in the last-named year, he was tried for bribery and corruption, and was sentenced to fine and imprisonment. We are not here directly concerned with Bacon's career as a lawyer, politician, courtier and man of letters, and consequently pass at once to his place in science and philosophy. Of his many scientific and philosophical treatises it is generally conceded that "The Advancement of Learning" and the "Novum Organum" are the most valuable, and we have, accordingly, selected them for reproduction. There is no doubt that Bacon, the first great teacher of the inductive method in modern times, shares with Descartes the honor of inaugurating modern philosophy. This position Bacon owes not only to the general spirit of his philosophy but to the manner in which he worked into a connected system the new mode of thinking, and to the incomparable power and eloquence with which he expounded and enforced it. Like all epoch-making works, the "Novum Organum" gave expression to ideas which were already beginning to be in the air. The time was ripe for a great change. Scholasticism, long decaying, had begun to fall; while here and there a few devoted experimenters were turning with fresh zeal to the unwithered face of nature. The fruitful thoughts which lay under and gave rise to these scattered efforts of the human mind, were gathered up into unity and reduced to system in the new philosophy of Bacon. A long line of thinkers have drawn inspiration from him, and it is not without justice that he has been looked upon as the originator and guiding spirit of that empirical school which numbers among its adherents such names as Hobbes, Locke, Hume, Hartley, Mill, Condillac and the Encyclopedists.

PREFACE

Lord Bacon can only be said to have carried the first three parts of his "Instauratio Magna" to any degree of perfection. Of these the "Sylva Sylvarum" is but a dry catalogue of natural phenomena, the collection of which, however necessary it might be, Bacon viewed as a sort of mechanical labor, and would never have stooped to the task, had not the field been abandoned by the generality of philosophers, as unworthy of them. The two other portions of the "Instauratio Magna," which these volumes

contain, unfold the design of his philosophy, and exhibit all the peculiarities of his extraordinary mind, enshrined in the finest passages of his writings.

Of the “De Augmentis,” though one of the greatest books of modern times, only three translations have appeared, and each of these strikingly imperfect. That of Wats, issued while Bacon was living, is singularly disfigured with solecisms, and called forth the just censures of Bacon and his friends. The version of Eustace Cary is no less unfortunate, owing to its poverty of diction, and antiquated phraseology. Under the public sense of these failures, another translation was produced about sixty years ago by Dr. Shaw, which might have merited approbation, had not the learned physician been impressed with the idea that he could improve Bacon by relieving his work of some of its choicest passages, and entirely altering the arrangement. In the present version, our task has been principally to rectify Shaw’s mistakes, by restoring the author’s own arrangement, and supplying the omitted portions. Such of Shaw’s notes as were deemed of value have been retained, and others added where the text seemed to require illustration. Due care also has been taken to point out the sources whence Bacon drew his extraordinary stores of learning, by furnishing authorities for the quotations and allusions in the text, so that the reader may view at a glance the principal authors whom Bacon loved to consult, and whose agency contributed to the formation of his colossal powers.

The version of the “Novum Organum” contained in this set is that by Wood, which is the best extant. The present edition of this immortal work has been enriched with an ample commentary, in which the remarks of the two Playfairs, Sir John Herschel, and the German and French editors, have been diligently consulted, that nothing may be wanting to render it as perfect as possible.

J. D.

[Back to Table of Contents]

FRANCIS OF VERULAM'S

GREAT INSTAURATION

ANNOUNCEMENT OF THE AUTHOR

francis of verulam thought thus, and such is the method which he determined within himself, and which he thought it concerned the living and posterity to know

Being convinced, by a careful observation, that the human understanding perplexes itself, or makes not a sober and advantageous use of the real helps within its reach, whence manifold ignorance and inconveniences arise, he was determined to employ his utmost endeavors toward restoring or cultivating a just and legitimate familiarity between the mind and things.

But as the mind, hastily and without choice, imbibes and treasures up the first notices of things, from whence all the rest proceed, errors must forever prevail, and remain uncorrected, either by the natural powers of the understanding or the assistance of logic; for the original notions being vitiated, confused, and inconsiderately taken from things, and the secondary ones formed no less rashly, human knowledge itself, the thing employed in all our researches, is not well put together nor justly formed, but resembles a magnificent structure that has no foundation.

And while men agree to admire and magnify the false powers of the mind, and neglect or destroy those that might be rendered true, there is no other course left but with better assistance to begin the work anew, and raise or rebuild the sciences, arts, and all human knowledge from a firm and solid basis.

This may at first seem an infinite scheme, unequal to human abilities, yet it will be found more sound and judicious than the course hitherto pursued, as tending to some issue; whereas all hitherto done with regard to the sciences is vertiginous, or in the way of perpetual rotation.

Nor is he ignorant that he stands alone in an experiment almost too bold and astonishing to obtain credit, yet he thought it not right to desert either the cause or himself, but to boldly enter on the way and explore the only path which is pervious to the human mind. For it is wiser to engage in an undertaking that admits of some termination, than to involve one's self in perpetual exertion and anxiety about what is interminable. The ways of contemplation, indeed, nearly correspond to two roads in nature, one of which, steep and rugged at the commencement, terminates in a plain; the other, at first view smooth and easy, leads only to huge rocks and precipices. Uncertain, however, whether these reflections would occur to another, and observing that he had never met any person disposed to apply his mind to similar thoughts, he determined to publish whatsoever he found time to perfect. Nor is this the haste of ambition, but anxiety, that if he should die there might remain behind him some

outline and determination of the matter his mind had embraced, as well as some mark of his sincere and earnest affection to promote the happiness of mankind.

[Back to Table of Contents]

AUTHOR'S PREFACE

Of the state of learning—That it is neither prosperous nor greatly advanced, and that a way must be opened to the human understanding entirely distinct from that known to our predecessors, and different aids procured, that the mind may exercise her power over the nature of things

It appears to me that men know neither their acquirements nor their powers, but fancy their possessions greater and their faculties less than they are; whence, either valuing the received arts above measure, they look out no further; or else despising themselves too much, they exercise their talents upon lighter matters, without attempting the capital things of all. And hence the sciences seem to have their Hercules' Pillars, which bound the desires and hopes of mankind.

But as a false imagination of plenty is among the principal causes of want, and as too great a confidence in things present leads to a neglect of the future, it is necessary we should here admonish mankind that they do not too highly value or extol either the number or usefulness of the things hitherto discovered; for, by closely inspecting the multiplicity of books upon arts and sciences, we find them to contain numberless repetitions of the same things in point of invention, but differing indeed as to the manner of treatment; so that the real discoveries, though at the first view they may appear numerous, prove upon examination but few. And as to the point of usefulness, the philosophy we principally received from the Greeks must be acknowledged puerile, or rather talkative than generative—as being fruitful in controversies, but barren of effects.

The fable of Scylla seems a civil representation of the present condition of knowledge; for she exhibited the countenance and expression of a virgin, while barking monsters encircled her womb. Even thus the sciences have their specious and plausible generalities; but when we descend to particulars, which, like the organs of generation, should produce fruits and effects, then spring up loud altercations and controversies, which terminate in barren sterility. And had this not been a lifeless kind of philosophy, it were scarce possible it should have made so little progress in so many ages, insomuch, that not only positions now frequently remain positions still, but questions remain questions, rather riveted and cherished than determined by disputes; philosophy thus coming down to us in the persons of master and scholar, instead of inventor and improver. In the mechanic arts the case is otherwise—these commonly advancing toward perfection in a course of daily improvement, from a rough unpolished state, sometimes prejudicial to the first inventors, while philosophy and the intellectual sciences are, like statues, celebrated and adored, but never advanced; nay, they sometimes appear most perfect in the original author, and afterward degenerate. For since men have gone over in crowds to the opinion of their leader, like those silent senators of Rome,[1] they add nothing to the extent of learning themselves, but perform the servile duty of waiting upon particular authors, and repeating their doctrines.

It is a fatal mistake to suppose that the sciences have gradually arrived at a state of perfection, and then been recorded by some one writer or other; and that as nothing better can afterward be invented, men need but cultivate and set off what is thus discovered and completed; whereas, in reality, this registering of the sciences proceeds only from the assurance of a few and the sloth and ignorance of many. For after the sciences might thus perhaps in several parts be carefully cultivated; a man of an enterprising genius rising up, who, by the conciseness of his method, renders himself acceptable and famous, he in appearance erects an art, but in reality corrupts the labors of his predecessors. This, however, is usually well received by posterity, as readily gratifying their curiosity, and indulging their indolence. But he that rests upon established consent as the judgment approved by time, trusts to a very fallacious and weak foundation; for we have but an imperfect knowledge of the discoveries in arts and sciences, made public in different ages and countries, and still less of what has been done by particular persons, and transacted in private; so that neither the births nor miscarriages of time are to be found in our records.

Nor is consent, or the continuance thereof, a thing of any account, for however governments may vary, there is but one state of the sciences, and that will forever be democratical or popular. But the doctrines in greatest vogue among the people, are either the contentious and quarrelsome, or the showy and empty; that is, such as may either entrap the assent, or lull the mind to rest; whence, of course, the greatest geniuses in all ages have suffered violence; while out of regard to their own character they submitted to the judgment of the times, and the populace. And thus when any more sublime speculations happened to appear, they were commonly tossed and extinguished by the breath of popular opinion. Hence time, like a river, has brought down to us what is light and tumid, but sunk what was ponderous and solid. As to those who have set up for teachers of the sciences, when they drop their character, and at intervals speak their sentiments, they complain of the subtilty of nature, the concealment of truth, the obscurity of things, the entanglement of causes, and the imperfections of the human understanding; thus rather choosing to accuse the common state of men and things, than make confession of themselves. It is also frequent with them to adjudge that impossible in an art, which they find that art does not affect; by which means they screen indolence and ignorance from the reproach they merit. The knowledge delivered down to us is barren in effects, fruitful in questions, slow and languid in improvement, exhibiting in its generalities the counterfeits of perfection, but meagre in its details, popular in its aim, but suspected by its very promoters, and therefore defended and propagated by artifice and chicanery. And even those who by experience propose to enlarge the bounds of the sciences, scarce ever entirely quit the received opinions, and go to the fountain-head, but think it enough to add somewhat of their own; as prudentially considering, that at the time they show their modesty in assenting, they may have a liberty of adding. But while this regard is shown to opinions and moral considerations, the sciences are greatly hurt by such a languid procedure; for it is scarce possible at once to admire and excel an author; as water rises no higher than the reservoir it falls from. Such men, therefore, though they improve some things, yet advance the sciences but little, or rather amend than enlarge them.

There have been also bolder spirits, and greater geniuses, who thought themselves at liberty to overturn and destroy the ancient doctrine, and make way for themselves and their opinions; but without any great advantage from the disturbance; as they did not effectively enlarge philosophy and arts by practical works, but only endeavored to substitute new dogmas, and to transfer the empire of opinion to themselves, with but small advantage; for opposite errors proceed mostly from common causes.

As for those who, neither wedded to their own nor others' opinions, but continuing friends to liberty, made use of assistance in their inquiries, the success they met with did not answer expectation, the attempt, though laudable, being but feeble; for pursuing only the probable reasons of things, they were carried about in a circle of arguments, and taking a promiscuous liberty, preserved not the rigor of true inquirers; while none of them duly conversed with experience and things themselves. Others again, who commit themselves to mechanical experience, yet make their experiments at random, without any method of inquiry. And the greatest part of these have no considerable views, but esteem it a great matter if they can make a single discovery; which is both a trifling and unskilful procedure, as no one can justly or successfully discover the nature of any one thing in that thing itself, or without numerous experiments which lead to further inquiries. And we must not omit to observe that all the industry displayed in experiment has been directed by too indiscreet a zeal at some prejudged effect, seeking those which produced fruit rather than knowledge, in opposition to the Divine method, which on the first day created time alone, delaying its material creations until the sun had illumined space.

Lastly, those who recommend logic as the best and surest instrument for improving the sciences, very justly observe, that the understanding, left to itself, ought always to be suspected. But here the remedy is neither equal to the disease, nor approved; for though the logic in use may be properly applied in civil affairs, and the arts that are founded in discourse and opinion, yet it by no means reaches the subtilty of nature; and by catching at what it cannot hold, rather serves to establish errors and fix them deeper than open the way of truth.2

Upon the whole, men do not hitherto appear to be happily inclined and fitted for the sciences, either by their own industry, or the authority of authors, especially as there is little dependence to be had upon the common demonstrations and experiments; while the structure of the universe renders it a labyrinth to the understanding; where the paths are not only everywhere doubtful, but the appearances of things and their signs deceitful; and the wreaths and knots of nature intricately turned and twisted;3 through all which we are only to be conducted by the uncertain light of the senses that sometimes shines, and sometimes hides its head; and by collections of experiments and particular facts, in which no guides can be trusted, as wanting direction themselves, and adding to the errors of the rest. In this melancholy state of things, one might be apt to despair both of the understanding left to itself, and of all fortuitous helps; as of a state irremediable by the utmost efforts of the human genius, or the often-repeated chance of trial. The only clew and method is to begin all anew, and direct our steps in a certain order, from the very first perceptions of the senses. Yet I must not be understood to say that nothing has been done in former ages, for the ancients have shown themselves worthy of admiration in everything which concerned

either wit or abstract reflection; but, as in former ages, when men at sea, directing their course solely by the observation of the stars, might coast along the shores of the continent, but could not trust themselves to the wide ocean, or discover new worlds, until the use of the compass was known; even so the present discoveries referring to matters immediately under the jurisdiction of the senses, are such as might easily result from experience and discussion; but before we can enter the remote and hidden parts of nature, it is requisite that a better and more perfect application of the human mind should be introduced. This, however, is not to be understood as if nothing had been effected by the immense labors of so many past ages; as the ancients have performed surprisingly in subjects that required abstract meditation, and force of genius. But as navigation was imperfect before the use of the compass, so will many secrets of nature and art remain undiscovered, without a more perfect knowledge of the understanding, its uses, and ways of working.

For our own part, from an earnest desire of truth, we have committed ourselves to doubtful, difficult, and solitary ways; and, relying on the Divine assistance, have supported our minds against the vehemence of opinions, our own internal doubts and scruples, and the darkness and fantastic images of the mind; that at length we might make more sure and certain discoveries for the benefit of posterity. And if we shall have effected anything to the purpose, what led us to it was a true and genuine humiliation of mind. Those who before us applied themselves to the discovery of arts, having just glanced upon things, examples, and experiments; immediately, as if invention was but a kind of contemplation, raised up their own spirits to deliver oracles: whereas our method is continually to dwell among things soberly, without abstracting or setting the understanding further from them than makes their images meet; which leaves but little work for genius and mental abilities. And the same humility that we practice in learning, the same we also observe in teaching, without endeavoring to stamp a dignity on any of our inventions, by the triumphs of confutation, the citations of antiquity, the producing of authorities, or the mask of obscurity; as any one might do, who had rather give lustre to his own name, than light to the minds of others. We offer no violence, and spread no nets for the judgments of men, but lead them on to things themselves, and their relations; that they may view their own stores, what they have to reason about, and what they may add, or procure, for the common good. And if at any time ourselves have erred, mistook, or broke off too soon, yet as we only propose to exhibit things naked, and open, as they are, our errors may be the readier observed, and separated, before they considerably infect the mass of knowledge; and our labors be the more easily continued. And thus we hope to establish forever a true and legitimate union between the experimental and rational faculty, whose fallen and inauspicious divorces and repudiations have disturbed everything in the family of mankind.

But as these great things are not at our disposal, we here, at the entrance of our work, with the utmost humility and fervency, put forth our prayers to God, that remembering the miseries of mankind, and the pilgrimage of this life, where we pass but few days and sorrowful, he would vouchsafe through our hands, and the hands of others, to whom he has given the like mind, to relieve the human race by a new act of his bounty. We likewise humbly beseech him that what is human may not clash with what is divine; and that when the ways of the senses are opened, and a greater natural

light set up in the mind, nothing of incredulity and blindness toward divine mysteries may arise; but rather that the understanding, now cleared up, and purged of all vanity and superstition, may remain entirely subject to the divine oracles, and yield to faith, the things that are faith's: and lastly, that expelling the poisonous knowledge infused by the serpent, which puffs up and swells the human mind, we may neither be wise above measure, nor go beyond the bounds of sobriety, but pursue the truth in charity.

We now turn ourselves to men, with a few wholesome admonitions and just requests. And first, we admonish them to continue in a sense of their duty, as to divine matters; for the senses are like the sun, which displays the face of the earth, but shuts up that of the heavens: and again, that they run not into the contrary extreme, which they certainly will do, if they think an inquiry into nature any way forbid them by religion. It was not that pure and unspotted natural knowledge whereby Adam gave names to things, agreeable to their natures, which caused his fall; but an ambitious and authoritative desire of moral knowledge, to judge of good and evil, which makes men revolt from God, and obey no laws but those of their own will. But for the sciences, which contemplate nature, the sacred philosopher declares, "It is the glory of God to conceal a thing, but the glory of a king to find it out."4 As if the Divine Being thus indulgently condescended to exercise the human mind by philosophical inquiries.

In the next place, we advise all mankind to think of the true ends of knowledge, and that they endeavor not after it for curiosity, contention, or the sake of despising others, nor yet for profit, reputation, power, or any such inferior consideration, but solely for the occasions and uses of life; all along conducting and perfecting it in the spirit of benevolence. Our requests are—1. That men do not conceive we here deliver an opinion, but a work; and assure themselves we attempt not to found any sect or particular doctrine, but to fix an extensive basis for the service of human nature. 2. That, for their own sakes, they lay aside the zeal and prejudices of opinions, and endeavor the common good; and that being, by our assistance, freed and kept clear from the errors and hindrances of the way, they would themselves also take part of the task. 3. That they do not despair, as imagining our project for a grand restoration, or advancement of all kinds of knowledge, infinitely beyond the power of mortals to execute; while in reality, it is the genuine stop and prevention of infinite error. Indeed, as our state is mortal, and human, a full accomplishment cannot be expected in a single age, and must therefore be commended to posterity. Nor could we hope to succeed, if we arrogantly searched for the sciences in the narrow cells of the human understanding, and not submissively in the wider world. 4. In the last place, to prevent ill effects from contention, we desire mankind to consider how far they have a right to judge our performance, upon the foundations here laid down: for we reject all that knowledge which is too hastily abstracted from things, as vague, disorderly, and ill-formed; and we cannot be expected to abide by a judgment which is itself called in question.

[Back to Table of Contents]

DISTRIBUTION OF THE WORK

IN SIX PARTS

1. Survey and Extension of the Sciences; or, the Advancement of Learning.
2. Novum Organum; or, Precepts for the Interpretation of Nature.
3. Phenomena of the Universe; or, Natural and Experimental History, on which to found Philosophy.
4. Ladder of the Understanding.
5. Precursors, or Anticipators, of the Second Philosophy.
6. Second Philosophy; or, Active Science.

We divide the whole of the work into six parts: the first whereof gives the substance, or general description of the knowledge which mankind at present possess; choosing to dwell a little upon things already received, that we may the easier perfect the old, and lead on to new; being equally inclined to cultivate the discoveries of antiquity, as to strike out fresh paths of science. In classing the sciences, we comprehend not only the things already invented and known, but also those omitted and wanted; for the intellectual globe, as well as the terrestrial, has both its frosts and deserts. It is therefore no wonder if we sometimes depart from the common divisions. For an addition, while it alters the whole, must necessarily alter the parts and their sections; whereas the received divisions are only fitted to the received sum of the sciences, as it now stands. With regard to the things we shall note as defective; it will be our method to give more than the bare titles, or short heads of what we desire to have done; with particular care, where the dignity or difficulty of the subject requires it, either to lay down the rules for effecting the work, or make an attempt of our own, by way of example, or pattern, of the whole. For it concerns our own character, no less than the advantage of others, to know that a mere capricious idea has not presented the subject to our mind, and that all we desire and aim at is a wish. For our designs are within the power of all to compass, and we ourselves have certain and evident demonstrations of their utility. We come not hither, as augurs, to measure out regions in our mind by divination, but like generals, to invade them for conquest. And this is the first part of the work.

When we have gone through the ancient arts, we shall prepare the human understanding for pressing on beyond them. The second object of the work embraces the doctrine of a more perfect use of reason, and the true helps of the intellectual faculties, so as to raise and enlarge the powers of the mind; and, as far as the condition of humanity allows, to fit it to conquer the difficulties and obscurities of nature. The thing we mean, is a kind of logic, by us called The Art of interpreting Nature; as differing widely from the common logic, which, however, pretends to assist and direct the understanding, and in that they agree: but the difference between them consists in three things, viz., the end, the order of demonstrating, and the grounds of inquiry.

The end of our new logic is to find, not arguments, but arts; not what agrees with principles, but principles themselves: not probable reasons, but plans and designs of works—a different intention producing a different effect. In one the adversary is conquered by dispute, and in the other nature by works. The nature and order of the demonstrations agree with this object. For in common logic, almost our whole labor is spent upon the syllogism. Logicians hitherto appear scarcely to have noticed induction, passing it over with some slight comment. But we reject the syllogistic method as being too confused, and allowing nature to escape out of our hands. For though nobody can doubt that those things which agree with the middle term agree with each other, nevertheless, there is this source of error, that a syllogism consists of propositions, propositions of words, and words are but the tokens and signs of things. Now, if the first notions, which are, as it were, the soul of words, and the basis of every philosophical fabric, are hastily abstracted from things, and vague and not clearly defined and limited, the whole structure falls to the ground. We therefore reject the syllogism, and that not only as regards first principles, to which logicians do not apply them, but also with respect to intermediate propositions, which the syllogism contrives to manage in such a way as to render barren in effect, unfit for practice, and clearly unsuited to the active branch of the sciences. Nevertheless, we would leave to the syllogism, and such celebrated and applauded demonstrations, their jurisdiction over popular and speculative acts; while, in everything relating to the nature of things, we make use of induction for both our major and minor propositions; for we consider induction as that form of demonstration which closes in upon nature and presses on, and, as it were, mixes itself with action. Whence the common order of demonstrating is absolutely inverted; for instead of flying immediately from the senses, and particulars, to generals, as to certain fixed poles, about which disputes always turn, and deriving others from these by intermediates, in a short, indeed, but precipitate manner, fit for controversy, but unfit to close with nature; we continually raise up propositions by degrees, and in the last place, come to the most general axioms, which are not notional, but well defined, and what nature allows of, as entering into the very essence of things.[1]

But the more difficult part of our task consists in the form of induction, and the judgment to be made by it; for that form of the logicians which proceeds by simple enumeration, is a childish thing, concludes unsafely, lies open to contradictory instances, and regards only common matters, yet determines nothing: while the sciences require such a form of induction, as can separate, adjust, and verify experience, and come to a necessary determination by proper exclusions and rejections.

Nor is this all; for we likewise lay the foundations of the sciences stronger and closer, and begin our inquiries deeper than men have hitherto done, bringing those things to the test which the common logic has taken upon trust. The logicians borrow the principles of the sciences from the sciences themselves, venerate the first notions of the mind, and acquiesce in the immediate informations of the senses, when rightly disposed; but we judge, that a real logic should enter every province of the sciences with a greater authority than their own principles can give; and that such supposed principles should be examined, till they become absolutely clear and certain. As for first notions of the mind, we suspect all those that the understanding, left to itself,

procures; nor ever allow them till approved and authorized by a second judgment. And with respect to the informations of the senses, we have many ways of examining them; for the senses are fallacious, though they discover their own errors; but these lie near, while the means of discovery are remote.

The senses are faulty in two respects, as they either fail or deceive us. For there are many things that escape the senses, though ever so rightly disposed; as by the subtilty of the whole body, or the minuteness of its parts; the distance of place; the slowness or velocity of motion; the commonness of the object, etc. Neither do the senses, when they lay hold of a thing, retain it strongly; for evidence, and the informations of sense, are in proportion to a man, and not in proportion to the universe.2 And it is a grand error to assert that sense is the measure of things.3

To remedy this, we have from all quarters brought together, and fitted helps for the senses; and that rather by experiments than by instruments; apt experiments being much more subtile than the senses themselves, though assisted with the most finished instruments. We, therefore, lay no great stress upon the immediate and natural perceptions of the senses, but desire the senses to judge only of experiments, and experiments to judge of things: on which foundation, we hope to be patrons of the senses, and interpreters of their oracles. And thus we mean to procure the things relating to the light of nature, and the setting it up in the mind; which might well suffice, if the mind were as white paper. But since the minds of men are so strangely disposed, as not to receive the true images of things, it is necessary also that a remedy be found for this evil.

The idols, or false notions, which possess the mind, are either acquired or innate. The acquired arise either from the opinions or sects of philosophers, or from preposterous laws of demonstration; but the innate cleave to the nature of the understanding, which is found much more prone to error than the senses. For however men may amuse themselves, and admire, or almost adore the mind, it is certain, that like an irregular glass, it alters the rays of things, by its figure and different intersections.

The two former kinds of idols may be extirpated, though with difficulty; but this third is insuperable. All that can be done, is to point them out, and mark, and convict that treacherous faculty of the mind; lest when the ancient errors are destroyed, new ones should sprout out from the rankness of the soil: and, on the other hand, to establish this forever, that the understanding can make no judgment but by induction, and the just form thereof. Whence the doctrine of purging the understanding requires three kinds of confutations, to fit it for the investigation of truth, viz.; the confutation of philosophies, the confutation of demonstrations, and the confutation of the natural reason. But when these have been completed, and it has been clearly seen what results are to be expected from the nature of things, and the nature of the human mind, we shall have then furnished a nuptial couch for the mind and the universe, the divine goodness being our bridemaid. And let it be the prayer of our Epithalamium, that assistance to man may spring from this union, and a race of discoveries, which will contribute to his wants and vanquish his miseries. And this is the second part of the work.

But as we propose not only to pave and show the way, but also to tread in it ourselves, we shall next exhibit the phenomena of the universe; that is, such experience of all kinds, and such a natural history, as may afford a foundation to philosophy. For as no fine method of demonstration, or form of explaining nature, can preserve the mind from error, and support it from falling; so neither can it hence receive any matter of science. Those, therefore, who determine not to conjecture and guess, but to find out and know; not to invent fables and romances of worlds, but to look into, and dissect the nature of this real world, must consult only things themselves. Nor can any force of genius, thought, or argument, be substituted for this labor, search, and inspection; not even though all the wits of men were united: this, therefore, must either be had, or the business be deserted forever. But the conduct of mankind has hitherto been such, that it is no wonder nature has not opened herself to them. For the information of the senses is treacherous and deceitful; observation careless, irregular, and accidental; tradition idle, rumorous, and vain; practice narrow and servile; experience blind, stupid, vague, and broken; and natural history extremely light and empty: wretched materials for the understanding to fashion into philosophy and the sciences! Then comes in a preposterous subtilty of augmentation and sifting, as a last remedy, that mends not the matter one jot, nor separates the errors. Whence there are absolutely no hopes of enlarging and promoting the sciences, without rebuilding them.

The first materials for this purpose must be taken from a new kind of natural history. The understanding must also have fit subjects to work upon, as well as real helps to work with. But our history, no less than our logic, differs from the common in many respects; particularly, 1. In its end or office; 2. Its collection; 3. Its subtilty; 4. Its choice; and 5. Its appointment for what is to follow.

Our natural history is not designed so much to please by its variety, or benefit by gainful experiments, as to afford light to the discovery of causes, and hold out the breasts to philosophy; for though we principally regard works, and the active parts of the sciences, yet we wait for the time of harvest, and would not reap the blade for the ear. We are well aware that axioms, rightly framed, will draw after them whole sheaves of works: but for that untimely and childish desire of seeing fruits of new works before the season, we absolutely condemn and reject it, as the golden apple that hinders the progress.

With regard to its collection; we propose to show nature not only in a free state, as in the history of meteors, minerals, plants, and animals; but more particularly as she is bound, and tortured, pressed, formed, and turned out of her course by art and human industry. Hence we would set down all opposite experiments of the mechanic and liberal arts, with many others not yet formed into arts; for the nature of things is better discovered by the torturings of art, than when they are left to themselves. Nor is it only a history of bodies that we would give; but also of their cardinal virtues, or fundamental qualities; as density, rarity, heat, cold, etc., which should be comprised in particular histories.

The kind of experiments to be procured for our history are much more subtile and simple than the common; abundance of them must be recovered from darkness, and are such as no one would have inquired after, that was not led by constant and certain

tract to the discovery of causes; as being in themselves of no great use, and consequently not sought for their own sake, but with regard to works: like the letters of the alphabet with regard to discourse.

In the choice of our narratives and experiments we hope to have shown more care than the other writers of natural history; as receiving nothing but upon ocular demonstration, or the strictest scrutiny of examination; and not heightening what is delivered to increase its miraculousness, but thoroughly purging it of superstition and fable. Besides this, we reject, with a particular mark, all those boasted and received falsehoods, which by a strange neglect have prevailed for so many ages, that they may no longer molest the sciences. For as the idle tales of nurses do really corrupt the minds of children, we cannot too carefully guard the infancy of philosophy from all vanity and superstition. And when any new or more curious experiment is offered, though it may seem to us certain and well founded; yet we expressly add the manner wherein it was made; that, after it shall be understood how things appear to us, men may beware of any error adhering to them, and search after more infallible proofs. We, likewise, all along interpose our directions, scruples and cautions; and religiously guard against phantoms and illusions.

Lastly, having well observed how far experiments and history distract the mind; and how difficult it is, especially for tender or prejudiced persons, to converse with nature from the beginning, we shall continually subjoin our observations, as so many first glances of natural history at philosophy; and this to give mankind some earnest, that they shall not be kept perpetually floating upon the waves of history; and that when they come to the work of the understanding, and the explanation of nature, they may find all things in greater readiness. This will conclude the third part.

After the understanding has been thus aided and fortified, we shall be prepared to enter upon philosophy itself. But in so difficult a task, there are certain things to be observed, as well for instruction as for present use. The first is to propose examples of inquiry and investigation, according to our own method, in certain subjects of the noblest kind, but greatly differing from each other, that a specimen may be had of every sort. By these examples we mean not illustrations of rules and precepts, but perfect models, which will exemplify the second part of this work, and represent, as it were, to the eye, the whole progress of the mind, and the continued structure and order of invention, in the most chosen subjects, after the same manner as globes and machines facilitate the more abstruse and subtile demonstrations in mathematics. We assign the fourth part of our work to these examples, which are nothing else than a particular application of the second part of our undertaking.[4]

The fifth part is only temporary, or of use but till the rest are finished; whence we look upon it as interest till the principal be paid; for we do not propose to travel hoodwinked, so as to take no notice of what may occur of use in the way. This part, therefore, will consist of such things as we have invented, experienced, or added, by the same common use of the understanding that others employ. For as we have greater hopes from our constant conversation with nature than from our force of genius, the discoveries we shall thus make may serve as inns on the road, for the mind to repose in, during its progress to greater certainties. But this, without being at all disposed to

abide by anything that is not discovered, or proved, by the true form of induction. Nor need any one be shocked at this suspension of the judgment, in a doctrine which does not assert that nothing is knowable; but only that things cannot be known except in a certain order and method: while it allows particular degrees of certainty, for the sake of commodiousness and use, until the mind shall enter on the explanation of causes. Nor were those schools of philosophers,5 who held positive truth to be unattainable, inferior to others who dogmatized at will. They did not, however, like us, prepare helps for the guidance of the senses and understanding, as we have done, but at once abolished all belief and authority, which is a totally different and almost opposite matter.

The sixth and last part of our work, to which all the rest are subservient, is to lay down that philosophy which shall flow from the just, pure and strict inquiry hitherto proposed. But to perfect this, is beyond both our abilities and our hopes, yet we shall lay the foundations of it, and recommend the superstructure to posterity. We design no contemptible beginning to the work; and anticipate that the fortune of mankind will lead it to such a termination as is not possible for the present race of men to conceive. The point in view is not only the contemplative happiness, but the whole fortunes, and affairs, and powers, and works of men. For man being the minister and interpreter of nature, acts and understands so far as he has observed of the order, the works and mind of nature, and can proceed no further; for no power is able to loose or break the chain of causes, nor is nature to be conquered but by submission; whence those twin intentions, human knowledge and human power, are really coincident; and the greatest hindrance to works is the ignorance of causes.

The capital precept for the whole undertaking is this, that the eye of the mind be never taken off from things themselves, but receive their images truly as they are. And God forbid that ever we should offer the dreams of fancy for a model of the world; but rather in his kindness vouchsafe to us the means of writing a revelation and true vision of the traces and molds of the Creator in his creatures.

May thou, therefore, O Father, who gavest the light of vision as the first fruit of creation, and who hast spread over the fall of man the light of thy understanding as the accomplishment of thy works, guard and direct this work, which, issuing from thy goodness, seeks in return thy glory! When thou hadst surveyed the works which thy hands had wrought, all seemed good in thy sight, and thou restedst. But when man turned to the works of his hands, he found all vanity and vexation of spirit, and experienced no rest. If, however, we labor in thy works, thou wilt make us to partake of thy vision and sabbath; we, therefore, humbly beseech thee to strengthen our purpose, that thou mayest be willing to endow thy family of mankind with new gifts, through our hands, and the hands of those in whom thou shalt implant the same spirit.

[Back to Table of Contents]

FIRST PART OF THE GREAT INSTAURATION

DIGNITY AND ADVANCEMENT OF LEARNING

IN NINE BOOKS

ON THE DIGNITY AND ADVANCEMENT OF LEARNING

FIRST BOOK

The Different Objections to Learning stated and confuted; its Dignity and Merit maintained

TO THE KING

AS UNDER the old law, most excellent king, there were daily sacrifices and free oblations[1] —the one arising out of ritual observance, and the other from a pious generosity, so I deem that all faithful subjects owe their kings a double tribute of affection and duty. In the first I hope I shall never be found deficient, but as regards the latter, though doubtful of the worthiness of my choice, I thought it more befitting to tender to your Majesty that service which rather refers to the excellence of your individual person than to the business of the State.

In bearing your Majesty in mind, as is frequently my custom and duty, I have been often struck with admiration, apart from your other gifts of virtue and fortune, at the surprising development of that part of your nature which philosophers call intellectual. The deep and broad capacity of your mind, the grasp of your memory, the quickness of your apprehension, the penetration of your judgment, your lucid method of arrangement, and easy facility of speech—at such extraordinary endowments I am forcibly reminded of the saying of Plato, "that all science is but remembrance,"[2] and that the human mind is originally imbued with all knowledge; that which she seems adventitiously to acquire in life being nothing more than a return to her first conceptions, which had been overlaid by the grossness of the body. In no person so much as your Majesty does this opinion appear more fully confirmed, your soul being apt to kindle at the intrusion of the slightest object; and even at the spark of a thought foreign to the purpose to burst into flame. As the Scripture says of the wisest king, "That his heart was as the sands of the sea,"[3] which, though one of the largest bodies, contains the finest and smallest particles of matter. In like manner God has endowed your Majesty with a mind capable of grasping the largest subjects and comprehending the least, though such an instrument seems an impossibility in nature. As regards your readiness of speech, I am reminded of that saying of Tacitus concerning Augustus Cæsar, "Augusto profluens ut quæ principem virum deceret, eloquentia fuit."[4] For all eloquence which is affected or overlabored, or merely imitative, though otherwise excellent, carries with it an air of servility, nor is it free to follow its own impulses.

But your Majesty's eloquence is indeed royal, streaming and branching out in nature's fashion as from a fountain, copious and elegant, original and inimitable. And as in those things which concern your crown and family, virtue seems to contend with fortune—your Majesty being possessed of a virtuous disposition and a prosperous government, a virtuous observance of the duties of the conjugal state with most blessed and happy fruit of marriage, a virtuous and most Christian desire of peace at a time when contemporary princes seem no less inclined to harmony—so likewise in intellectual gifts there appears as great a contention between your Majesty's natural talents and the universality and perfection of your learning. Nor indeed would it be easy to find any monarch since the Christian era who could bear any comparison with your Majesty in the variety and depth of your erudition. Let any one run over the whole line of kings, and he will agree with me. It indeed seems a great thing in a monarch, if he can find time to digest a compendium or imbibe the simple elements of science, or love and countenance learning; but that a king, and he a king born, should have drunk at the true fountain of knowledge, yea, rather, should have a fountain of learning in himself, is indeed little short of a miracle. And the more since in your Majesty's heart are united all the treasures of sacred and profane knowledge, so that like Hermes your Majesty is invested with a triple glory, being distinguished no less by the power of a king than by the illumination of a priest and the learning of a philosopher.5 Since, then, your Majesty surpasses other monarchs by this property, which is peculiarly your own, it is but just that this dignified pre-eminence should not only be celebrated in the mouths of the present age, and be transmitted to posterity, but also that it should be engraved in some solid work which might serve to denote the power of so great a king and the height of his learning.

Therefore, to return to our undertaking: no oblation seemed more suitable than some treatise relating to that purpose, the sum of which should consist of two parts—the first of the excellence of learning, and the merit of those who labor judiciously and with energy for its propagation and development. The second, to point out what part of knowledge has been already labored and perfected, and what portions left unfinished or entirely neglected; in order, since I dare not positively advise your Majesty to adopt any particular course, that by a detailed representation of our wants, I may excite your Majesty to examine the treasures of your royal heart, and thence to extract, whatever to your magnanimity and wisdom may seem best fitted to enlarge the boundaries of knowledge.

On the threshold of the first part it is advisable to sift the merits of knowledge, and clear it of the disgrace brought upon it by ignorance, whether disguised (1) in the zeal of divines, (2) the arrogance of politicians, or (3) the errors of men of letters.

Some divines pretend, 1. "That knowledge is to be received with great limitation, as the aspiring to it was the original sin, and the cause of the fall; 2. That it has somewhat of the serpent, and puffeth up"; 3. That Solomon says, "Of making books there is no end: much study is weariness of the flesh; for in much wisdom is much grief; and he that increaseth knowledge, increaseth sorrow":6 4. "That St. Paul cautions being spoiled through vain philosophy":7 5. "That experience shows learned men have been heretics; and learned times inclined to atheism; and that the

contemplation of second causes takes from our dependence upon God, who is the first."

To this we answer, 1. It was not the pure knowledge of nature, by the light whereof man gave names to all the creatures in Paradise, agreeable to their natures, that occasioned the fall; but the proud knowledge of good and evil, with an intent in man to give law to himself, and depend no more upon God. 2. Nor can any quantity of natural knowledge puff up the mind; for nothing fills, much less distends the soul, but God. Whence as Solomon declares, "That the eye is not satisfied with seeing, nor the ear with hearing";8 so of knowledge itself he says, "God hath made all things beautiful in their seasons; also he hath placed the world in man's heart; yet cannot man find out the work which God worketh from the beginning to the end";9 hereby declaring plainly that God has framed the mind like a glass, capable of the image of the universe, and desirous to receive it as the eye to receive the light; and thus it is not only pleased with the variety and vicissitudes of things, but also endeavors to find out the laws they observe in their changes and alterations. And if such be the extent of the mind, there is no danger of filling it with any quantity of knowledge. But it is merely from its quality when taken without the true corrective that knowledge has somewhat of venom or malignity. The corrective which renders it sovereign is charity, for according to St. Paul, "Knowledge puffeth up, but charity buildeth."10 3. For the excess of writing and reading books, the anxiety of spirit proceeding from knowledge, and the admonition that we be not seduced by vain philosophy; when these passages are rightly understood, they mark out the boundaries of human knowledge, so as to comprehend the universal nature of things. These limitations are three: the first, that we should not place our felicity in knowledge, so as to forget mortality; the second, that we use knowledge so as to give ourselves ease and content, not distaste and repining; and the third, that we presume not by the contemplation of nature, to attain to the mysteries of God. As to the first, Solomon excellently says, "I saw that wisdom excelleth folly as far as light excelleth darkness. The wise man's eyes are in his head but the fool walketh in darkness; and I myself perceived also that one event happeneth to them all."11 And for the second, it is certain that no vexation or anxiety of mind results from knowledge, but merely by accident; all knowledge, and admiration, which is the seed of knowledge, being pleasant in itself; but when we frame conclusions from our knowledge, apply them to our own particular, and thence minister to ourselves weak fears or vast desires; then comes on that anxiety and trouble of mind which is here meant—when knowledge is no longer the dry light of Heraclitus, but the drenched one, steeped in the humors of the affections.12 4. The third point deserves to be more dwelt upon; for if any man shall think, by his inquiries after material things, to discover the nature or will of God, he is indeed spoiled by vain philosophy; for the contemplation of God's works produces knowledge, though, with regard to him, not perfect knowledge, but wonder, which is broken knowledge. It may, therefore, be properly said, "That the sense resembles the sun, which shows the terrestrial globe, but conceals the celestial";13 for thus the sense discovers natural things, while it shuts up divine. And hence some learned men have, indeed, been heretical, while they sought to seize the secrets of the Deity borne on the waxen wings of the senses. 5. As to the point that too much knowledge should incline to atheism, and the ignorance of second causes make us more dependent upon God, we ask Job's question, "Will ye lie for God, as one man will do for another, to gratify him?"14 For

certainly God works nothing in nature but by second causes;15 and to assert the contrary is mere imposture, as it were, in favor of God, and offering up to the author of truth the unclean sacrifice of a lie. Undoubtedly a superficial tincture of philosophy may incline the mind to atheism, yet a further knowledge brings it back to religion;16 for on the threshold of philosophy, where second causes appear to absorb the attention, some oblivion of the highest cause may ensue; but when the mind goes deeper, and sees the dependence of causes and the works of Providence, it will easily perceive, according to the mythology of the poets, that the upper link of Nature's chain is fastened to Jupiter's throne.17 To conclude, let no one weakly imagine that man can search too far, or be too well studied in the book of God's word, and works, divinity, and philosophy; but rather let them endeavor an endless progression in both, only applying all to charity, and not to pride—to use, not ostentation, without confounding the two different streams of philosophy and revelation together.18

The reflections cast upon learning by politicians, are these. 1. "That it enervates men's minds, and unfits them for arms; 2. That it perverts their dispositions for government and politics; 3. That it makes them too curious and irresolute, by variety of reading; too peremptory or positive by strictness of rules; too immoderate and conceited by the greatness of instances; too unsociable and incapacitated for the times, by the dissimilitude of examples; or at least, 4. That it diverts from action and business, and leads to a love of retirement; 5. That it introduces a relaxation in government, as every man is more ready to argue than obey; whence Cato the censor—when Carneades came ambassador to Rome, and the young Romans, allured with his eloquence, flocked about him—gave counsel in open senate, to grant him his despatch immediately, lest he should infect the minds of the youth, and insensibly occasion an alteration in the State."19

The same conceit is manifest in Virgil, who, preferring the honor of his country to that of his profession, challenged the arts of policy in the Romans, as something superior to letters, the pre-eminence in which, he freely assigns to the Grecians.

> "Tu regere imperio populos, Romane memento:
> Hæ tibi erunt artes."
>
> —*Æn.* vi. 851.

And we also observe that Anytus, the accuser of Socrates, charged him in his impeachment with destroying, in the minds of young men, by his rhetorical arts, all authority and reverence for the laws of the country.20

1. But these and the like imputations have rather a show of gravity, than any just ground; for experience shows that learning and arms have flourished in the same persons and ages. As to persons, there are no better instances than Alexander and Cæsar, the one Aristotle's scholar in philosophy, and the other Cicero's rival in eloquence; and again, Epaminondas and Xenophon, the one whereof first abated the power of Sparta, and the other first paved the way for subverting the Persian monarchy. This concurrence of learning and arms, is yet more visible in times than in persons, as an age exceeds a man. For in Egypt, Assyria, Persia, Greece, and Rome,

the times most famous for arms are likewise most admired for learning; so that the greatest authors and philosophers, the greatest leaders and governors, have lived in the same ages. Nor can it well be otherwise; for as the fulness of human strength, both in body and mind, comes nearly at an age; so arms and learning, one whereof corresponds to the body, the other to the soul, have a near concurrence in point of time.

2. And that learning should rather prove detrimental than serviceable in the art of government, seems very improbable. It is wrong to trust the natural body to empirics, who commonly have a few receipts whereon they rely, but who know neither the causes of diseases, nor the constitutions of patients, nor the danger of accidents, nor the true methods of cure. And so it must needs be dangerous to have the civil body of States managed by empirical statesmen, unless well mixed with others who are grounded in learning. On the contrary, it is almost without instance, that any government was unprosperous under learned governors. For however common it has been with politicians to discredit learned men, by the name of pedants, yet it appears from history, that the governments of princes in minority have excelled the governments of princes in maturity, merely because the management was in learned hands. The State of Rome for the first five years, so much magnified, during the minority of Nero, was in the hands of Seneca, a pedant: so it was for ten years, during the minority of Gordianus the younger, with great applause in the hands of Misitheus, a pedant; and it was as happy before that, in the minority of Alexander Severus, under the rule of women, assisted by preceptors. And to look into the government of the bishops of Rome, particularly that of Pius and Sextus Quintus, who were both at their entrance esteemed but pedantical friars, we shall find that such popes did greater things, and proceeded upon truer principles of state, than those who rose to the papacy from an education in civil affairs, and the courts of princes. For though men bred to learning are perhaps at a loss in points of convenience, and present accommodations, called21 reasons of state, yet they are perfect in the plain grounds of religion, justice, honor, and moral virtue, which, if well pursued, there will be as little use of reasons of state, as of physic in a healthy constitution. Nor can the experience of one man's life furnish examples and precedents for another's: present occurrences frequently correspond to ancient examples, better than to later. And lastly, the genius of any single man can no more equal learning, than a private purse hold way with the exchequer.

3. As to the particular indispositions of the mind for politics and government, laid to the charge of learning, if they are allowed of any force, it must be remembered, that learning affords more remedies than it breeds diseases; for if, by a secret operation, it renders men perplexed and irresolute, on the other hand, by plain precept, it teaches when, and upon what grounds, to resolve, and how to carry things in suspense, without prejudice: if it makes men positive and stiff, it shows what things are in their nature demonstrative, what conjectural; and teaches the use of distinctions and exceptions, as well as the rigidness of principles and rules. If it misleads, by the unsuitableness of examples, it shows the force of circumstances, the errors of comparisons, and the cautions of application; so that in all cases, it rectifies more effectually than it perverts: and these remedies it conveys into the mind much more effectually by the force and variety of examples. Let a man look into the errors of

Clement the Seventh, so livelily described by Guicciardini; or into those of Cicero, described by himself in his epistles to Atticus, and he will fly from being irresolute: let him look into the errors of Phocion, and he will beware of obstinacy or inflexibility: let him read the fable of Ixion,22 and it will keep him from conceitedness: let him look into the errors of the second Cato, and he will never tread opposite to the world.23

4. For the pretence that learning disposes to retirement, privacy, and sloth; it were strange if what accustoms the mind to perpetual motion and agitation should induce indolence; whereas no kind of men love business, for its own sake, but the learned; while others love it for profit, as hirelings for the wages; others for honor; others because it bears them up in the eyes of men, and refreshes their reputations, which would otherwise fade; or because it reminds them of their fortune, and gives them opportunities of revenging and obliging; or because it exercises some faculty, wherein they delight, and so keeps them in good humor with themselves. Whence, as false valor lies in the eyes of the beholders, such men's industry lies in the eyes of others, or is exercised with a view to their own designs; while the learned love business, as an action according to nature, and agreeable to the health of the mind, as exercise is to that of the body: so that, of all men, they are the most indefatigable in such business as may deservedly fill and employ the mind. And if there are any laborious in study, yet idle in business, this proceeds either from a weakness of body, or a softness of disposition, and not from learning itself, as Seneca remarks, "Quidam tam sunt umbratiles ut putent in turbido esse, quicquid in luce est."24 The consciousness of such a disposition may indeed incline a man to learning, but learning does not breed any such temper in him.

If it be objected, that learning takes up much time, which might be better employed, I answer that the most active or busy men have many vacant hours, while they expect the tides and returns of business; and then the question is, how those spaces of leisure shall be filled up, whether with pleasure or study? Demosthenes being taunted by Æschines, a man of pleasure, that his speeches smelt of the lamp, very pertly retorted, "There is great difference between the objects which you and I pursue by lamplight."25 No fear, therefore, that learning should displace business, for it rather keeps and defends the mind against idleness and pleasure, which might otherwise enter to the prejudice both of business and learning. 5. For the allegation that learning should undermine the reverence due to laws and government, it is a mere calumny, without shadow of truth; for to say that blind custom of obedience should be a safer obligation than duty, taught and understood, is to say that a blind man may tread surer by a guide than a man with his eyes open can by a light. And, doubtless, learning makes the mind gentle and pliable to government, whereas ignorance renders it churlish and mutinous; and it is always found that the most barbarous, rude, and ignorant times have been most tumultuous, changeable, and seditious.

6. As to the judgment of Cato the Censor, he was punished for his contempt of learning, in the kind wherein he offended, for when past threescore the humor took him to learn Greek, which shows that his former censure of the Grecian learning was rather an affected gravity than his inward sense.26 And, indeed, the Romans never arrived at their height of empire till they had arrived at their height of arts; for in the

time of the first two Cæsars, when their government was in its greatest perfection, there lived the best poet, Virgil; the best historiographer, Livy; the best antiquary, Varro; and the best, or second best orator, Cicero, that the world has known. And as to the persecution of Socrates, the time must be remembered in which it occurred, viz., under the reign of the Thirty Tyrants, of all mortals the bloodiest and basest that ever reigned, since the government had no sooner returned to its senses than that judgment was reversed. Socrates, from being a criminal, started at once into a hero, his memory loaded with honors human and divine, and his discourses, which had been previously stigmatized as immoral and profane, were considered as the reformers of thought and manners.27 And let this suffice as an answer to those politicians who have presumed, whether sportively or in earnest, to disparage learning.

We come now to that sort of discredit which is brought upon learning by learned men themselves; and this proceeds either (1) from their fortune, (2) their manners, or (3) the nature of their studies.

1. The disrepute of learning from the fortune or condition of the learned, regards either their indigence, retirement, or meanness of employ. As to the point, that learned men grow not so soon rich as others, because they convert not their labors to profit, we might turn it over to the friars, of whom Machiavel said, “That the kingdom of the clergy had been long since at an end, if the reputation and reverence toward the poverty of the monks and mendicants had not borne out the excesses of bishops and prelates.”28 For so the splendor and magnificence of the great had long since sunk into rudeness and barbarism, if the poverty of learned men had not kept up civility and reputation. But to drop such advantages, it is worth observing how reverend and sacred poverty was esteemed for some ages in the Roman State, since, as Livy says, “There never was a republic greater, more venerable, and more abounding in good examples than the Roman, nor one that so long withstood avarice and luxury, or so much honored poverty and parsimony.”29 And we see, when Rome degenerated, how Julius Cæsar after his victory was counselled to begin the restoration of the State, by abolishing the reputation of wealth. And, indeed, as we truly say that blushing is the livery of virtue, though it may sometimes proceed from guilt,30 so it holds true of poverty that it is the attendant of virtue, though sometimes it may proceed from mismanagement and accident.

As for retirement, it is a theme so common to extol a private life, not taxed with sensuality and sloth, for the liberty, the pleasure, and the freedom from indignity it affords, that every one praises it well, such an agreement it has to the nature and apprehensions of mankind. This may be added, that learned men, forgotten in States and not living in the eyes of the world, are like the images of Cassius and Brutus at the funeral of Junia, which not being represented as many others were, Tacitus said of them that “they outshone the rest, because not seen.”31

As for their meanness of employ, that most exposed to contempt is the education of youth, to which they are commonly allotted. But how unjust this reflection is to all who measure things, not by popular opinion, but by reason, will appear in the fact that men are more careful what they put into new vessels than into those already seasoned. It is manifest that things in their weakest state usually demand our best attention and

assistance. Hearken to the Hebrew rabbis: “Your young men shall see visions, your old men shall dream dreams”;32 upon which the commentators observe, that youth is the worthier age, inasmuch as revelation by vision is clearer than by dreams. And to say the truth, how much soever the lives of pedants have been ridiculed upon the stage, as the emblem of tyranny, because the modern looseness or negligence has not duly regarded the choice of proper schoolmasters and tutors; yet the wisdom of the ancientest and best times always complained that States were too busy with laws and too remiss in point of education. This excellent part of ancient discipline, has in some measure been revived of late by the colleges of Jesuits abroad; in regard of whose diligence in fashioning the morals and cultivating the minds of youth, I may say, as Agesilaus said to his enemy Pharnabasus, “Talis quum sis, utinam noster esses.”33

2. The manners of learned men belong rather to their individual persons than to their studies or pursuits. No doubt, as in all other professions and conditions of life, bad and good are to be found among them; yet it must be admitted that learning and studies, unless they fall in with very depraved dispositions, have, in conformity with the adage, “Abire studia in mores,” a moral influence upon men’s lives. For my part I cannot find that any disgrace to learning can proceed from the habits of learned men, inherent in them as learned, unless peradventure that may be a fault which was attributed to Demosthenes, Cicero, the second Cato, and many others, that seeing the times they read of more pure than their own, pushed their servility too far in the reformation of manners, and to seek to impose, by austere precepts, the laws of ancient asceticism upon dissolute times. Yet even antiquity should have forewarned them of this excess; for Solon, upon being asked if he had given his citizens the best laws, replied, “The best they were capable of receiving.”34 And Plato, finding that he had fallen upon corrupt times, refused to take part in the administration of the commonwealth, saying that a man should treat his country with the same forbearance as his parents, and recall her from a wrong course, not by violence or contest, but by entreaty and persuasion.35 Cæsar’s counsellor administers the same caveat in the words, “Non ad vetera instituta revocamus quæ jampridem corruptis moribus ludibrio sunt.”36 Cicero points out the same error in the second Cato, when writing to his friend Atticus: “Cato optime sentit sed nocet interdum Reipublicæ; loquitur enim tanquam in Republica Platonis, non tanquam in fæce Romuli.”37 The same orator likewise excuses and blames the philosophers for being too exact in their precepts. These preceptors, said he, have stretched the lines and limits of duties beyond their natural boundaries, thinking that we might safely reform when we had reached the highest point of perfection.38 And yet himself stumbled over the same stone, so that he might have said, “Monitis sum minor ipse meis.”39

3. Another fault laid to the charge of learned men, and arising from the nature of their studies, is, “That they esteem the preservation, good, and honor of their country before their own fortunes or safeties.” Demosthenes said well to the Athenians, “My counsels are not such as tend to aggrandize myself and diminish you, but sometimes not expedient for me to give, though always expedient for you to follow.”40 So Seneca, after consecrating the five years of Nero’s minority to the immortal glory of learned governors, held on his honest course of good counsel after his master grew extremely corrupt. Nor can this be otherwise; for learning gives men a true sense of their frailty, the casualty of fortune, and the dignity of the soul and its office; whence

they cannot think any greatness of fortune a worthy end of their living, and therefore live so as to give a clear and acceptable account to God and their superiors; while the corrupter sort of politicians, who are not by learning established in a love of duty, nor ever look abroad into universality, refer all things to themselves, and thrust their persons into the centre of the world, as if all lines should meet in them and their fortunes, without regarding in storms what becomes of the ship of the State, if they can save themselves in the cock-boat of their own fortune.

Another charge brought against learned men, which may rather be defended than denied, is, "That they sometimes fail in making court to particular persons." This want of application arises from two causes—the one the largeness of their mind, which can hardly submit to dwell in the examination and observance of any one person. It is the speech of a lover rather than of a wise man, "Satis magnum alter alteri theatrum sumus."41 Nevertheless he who cannot contract the sight of his mind, as well as dilate it, wants a great talent in life. The second cause is, no inability, but a rejection upon choice and judgment; for the honest and just limits of observation in one person upon another extend no further than to understand him sufficiently, so as to give him no offence, or be able to counsel him, or to stand upon reasonable guard and caution with respect to one's self; but to pry deep into another man, to learn to work, wind, or govern him, proceeds from a double heart, which in friendship is want of integrity, and toward princes or superiors want of duty. The eastern custom which forbids subjects to gaze upon princes, though in the outward ceremony barbarous, has a good moral; for men ought not, by cunning and studied observations, to penetrate and search into the hearts of kings, which the Scripture declares inscrutable.42

Another fault noted in learned men is, "That they often fail in point of discretion and decency of behavior, and commit errors in ordinary actions, whence vulgar capacities judge of them in greater matters by what they find them in small." But this consequence often deceives; for we may here justly apply the saying of Themistocles, who being asked to touch a lute, replied, "He could not fiddle, but he could make a little village a great city."43 Accordingly many may be well skilled in government and policy, who are defective in little punctilios. So Plato compared his master Socrates to the shop-pots of apothecaries painted on the outside with apes and owls and antiques, but contained within sovereign and precious remedies.44