

The Advancement of Learning

Francis Bacon

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Title: The Advancement of Learning

Author: Francis Bacon

Release Date: April, 2004 [EBook #5500]
[Yes, we are more than one year ahead of schedule]
[This file was first posted on July 16, 2002]

Edition: 10

Language: English

Character set encoding: ASCII

***** START OF THE PROJECT GUTENBERG EBOOK, THE ADVANCEMENT OF LEARNING *****

Transcribed from the 1893 Cassell & Company edition by David Price,
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THE ADVANCEMENT OF LEARNING

INTRODUCTION.

"The TVVOO Bookes of Francis Bacon. Of the proficiencie and aduancement of Learning, diuine and humane. To the King. At London. Printed for Henrie Tomes, and are to be sould at his shop at Graies Inne Gate in Holborne. 1605." That was the original title-page of the book now in the reader's hand--a living book that led the way to a new world of thought. It was the book in which Bacon, early in the reign of James the First, prepared the way for a full setting forth of his New Organon, or instrument of knowledge.

The Organon of Aristotle was a set of treatises in which Aristotle had written the doctrine of propositions. Study of these treatises was a chief occupation of young men when they passed from school to college, and proceeded from Grammar to Logic, the second of the Seven Sciences. Francis Bacon as a youth of sixteen, at Trinity College, Cambridge, felt the unfruitfulness of this method of search after truth. He was the son of Sir Nicholas Bacon, Queen Elizabeth's Lord Keeper, and was born at York House, in the Strand, on the 22nd of January, 1561. His mother was the Lord Keeper's second wife, one of two sisters, of whom the other married Sir William Cecil, afterwards Lord Burleigh. Sir Nicholas Bacon had six children by his former marriage, and by his second wife two sons, Antony and Francis, of whom Antony was about two years the elder. The family home was at York Place, and at Gorhambury, near St. Albans, from which town, in its ancient and its modern style, Bacon afterwards took his titles of Verulam and St. Albans.

Antony and Francis Bacon went together to Trinity College, Cambridge, when Antony was fourteen years old and Francis twelve. Francis remained at Cambridge only until his sixteenth year; and Dr. Rawley, his chaplain in after-years, reports of him that "whilst he was commorant in the University, about sixteen years of age (as his lordship hath been pleased to impart unto myself), he first fell into dislike of the philosophy of Aristotle; not for the worthlessness of the author, to whom he would ascribe all high attributes, but for the unfruitfulness of the way, being a philosophy (as his lordship used to say) only strong for disputatious and contentions, but barren of the production of works for the benefit of the life of man; in which mind he continued to his dying day." Bacon was sent as a youth of sixteen to Paris with the ambassador Sir Amyas Paulet, to begin his training for the public service; but his father's death, in February, 1579, before he had completed the provision he was making for his youngest children, obliged him to return to London, and, at the age of eighteen, to settle down at Gray's Inn to the study of law as a profession. He was admitted to the outer bar in June, 1582, and about that time, at the age of twenty-one, wrote a sketch of his conception of a New Organon that should lead man to more fruitful knowledge, in a little Latin tract, which he called "Temporis Partus Maximus" ("The Greatest Birth of Time").

In November, 1584, Bacon took his seat in the House of Commons as

member for Melcombe Regis, in Dorsetshire. In October, 1586, he sat for Taunton. He was member afterwards for Liverpool; and he was one of those who petitioned for the speedy execution of Mary Queen of Scots. In October, 1589, he obtained the reversion of the office of Clerk of the Council in the Star Chamber, which was worth 1,600 pounds or 2,000 pounds a year; but for the succession to this office he had to wait until 1608. It had not yet fallen to him when he wrote his "Two Books of the Advancement of Learning." In the Parliament that met in February, 1593, Bacon sat as member for Middlesex. He raised difficulties of procedure in the way of the grant of a treble subsidy, by just objection to the joining of the Lords with the Commons in a money grant, and a desire to extend the time allowed for payment from three years to six; it was, in fact, extended to four years. The Queen was offended. Francis Bacon and his brother Antony had attached themselves to the young Earl of Essex, who was their friend and patron. The office of Attorney-General became vacant. Essex asked the Queen to appoint Francis Bacon. The Queen gave the office to Sir Edward Coke, who was already Solicitor-General, and by nine years Bacon's senior. The office of Solicitor-General thus became vacant, and that was sought for Francis Bacon. The Queen, after delay and hesitation, gave it, in November, 1595, to Serjeant Fleming. The Earl of Essex consoled his friend by giving him "a piece of land"--Twickenham Park--which Bacon afterwards sold for 1,800 pounds--equal, say, to 12,000 pounds in present buying power. In 1597 Bacon was returned to Parliament as member for Ipswich, and in that year he was hoping to marry the rich widow of Sir William Hatton, Essex helping; but the lady married, in the next year, Sir Edward Coke. It was in 1597 that Bacon published the First Edition of his Essays. That was a little book containing only ten essays in English, with twelve "Meditationes Sacrae," which were essays in Latin on religious subjects. From 1597 onward to the end of his life, Bacon's Essays were subject to continuous addition and revision. The author's Second Edition, in which the number of the Essays was increased from ten to thirty-eight, did not appear until November or December, 1612, seven years later than these two books on the "Advancement of Learning;" and the final edition of the Essays, in which their number was increased from thirty-eight to fifty-eight, appeared only in 1625; and Bacon died on the 9th of April, 1626. The edition of the Essays published in 1597, under Elizabeth, marked only the beginning of a course of thought that afterwards flowed in one stream with his teachings in philosophy.

In February, 1601, there was the rebellion of Essex. Francis Bacon had separated himself from his patron after giving him advice that was disregarded. Bacon, now Queen's Counsel, not only appeared against his old friend, but with excess of zeal, by which, perhaps, he hoped to win back the Queen's favour, he twice obtruded violent attacks upon Essex when he was not called upon to speak. On the 25th of February, 1601, Essex was beheaded. The genius of Bacon was next employed to justify that act by "A Declaration of the Practices and Treasons attempted and committed by Robert late Earle of Essex and his Complices." But James of Scotland, on whose behalf Essex had intervened, came to the throne by the death of Elizabeth on the 24th of March, 1603. Bacon was among the crowd of men who were made knights by James I., and he had to justify himself under the new

order of things by writing "Sir Francis Bacon his Apologie in certain Imputations concerning the late Earle of Essex." He was

returned to the first Parliament of James I. by Ipswich and St. Albans, and he was confirmed in his office of King's Counsel in August, 1604; but he was not appointed to the office of Solicitor-General when it became vacant in that year.

That was the position of Francis Bacon in 1605, when he published this work, where in his First Book he pointed out the discredits of learning from human defects of the learned, and emptiness of many of the studies chosen, or the way of dealing with them. This came, he said, especially by the mistaking or misplacing of the last or furthest end of knowledge, as if there were sought in it "a couch whereupon to rest a searching and restless spirit; or a terrace for a wandering and variable mind to walk up and down with a fair prospect; or a tower of state for a proud mind to raise itself upon; or a fort or commanding ground for strife and contention; or a shop for profit or sale; and not a rich storehouse for the glory of the Creator and the relief of man's estate." The rest of the First Book was given to an argument upon the Dignity of Learning; and the Second Book, on the Advancement of Learning, is, as Bacon himself described it, "a general and faithful perambulation of learning, with an inquiry what parts thereof lie fresh and waste, and not improved and converted by the industry of man; to the end that such a plot made and recorded to memory may both minister light to any public designation and also serve to excite voluntary endeavours." Bacon makes, by a sort of exhaustive analysis, a ground-plan of all subjects of study, as an intellectual map, helping the right inquirer in his search for the right path. The right path is that by which he has the best chance of adding to the stock of knowledge in the world something worth labouring for; and the true worth is in labour for "the glory of the Creator and the relief of man's estate."

H. M.

THE FIRST BOOK OF FRANCIS BACON; OF THE PROFICIENCE AND ADVANCEMENT OF LEARNING, DIVINE AND HUMAN.

To the King.

There were under the law, excellent King, both daily sacrifices and freewill offerings; the one proceeding upon ordinary observance, the other upon a devout cheerfulness: in like manner there belongeth to kings from their servants both tribute of duty and presents of affection. In the former of these I hope I shall not live to be wanting, according to my most humble duty and the good pleasure of your Majesty's employments: for the latter, I thought it more respective to make choice of some oblation which might rather refer to the propriety and excellency of your individual person, than to the business of your crown and state.

Wherefore, representing your Majesty many times unto my mind, and beholding you not with the inquisitive eye of presumption, to discover that which the Scripture telleth me is inscrutable, but

with the observant eye of duty and admiration, leaving aside the other parts of your virtue and fortune, I have been touched--yea, and possessed--with an extreme wonder at those your virtues and faculties, which the philosophers call intellectual; the largeness of your capacity, the faithfulness of your memory, the swiftness of your apprehension, the penetration of your judgment, and the facility and order of your elocution: and I have often thought that of all the persons living that I have known, your Majesty were the best instance to make a man of Plato's opinion, that all knowledge is but remembrance, and that the mind of man by Nature knoweth all things, and hath but her own native and original notions (which by the strangeness and darkness of this tabernacle of the body are sequestered) again revived and restored: such a light of Nature I have observed in your Majesty, and such a readiness to take flame and blaze from the least occasion presented, or the least spark of another's knowledge delivered. And as the Scripture saith of the wisest king, "That his heart was as the sands of the sea;" which, though it be one of the largest bodies, yet it consisteth of the smallest and finest portions; so hath God given your Majesty a composition of understanding admirable, being able to compass and comprehend the greatest matters, and nevertheless to touch and apprehend the least; whereas it should seem an impossibility in Nature for the same instrument to make itself fit for great and small works. And for your gift of speech, I call to mind what Cornelius Tacitus saith of Augustus Caesar: *Augusto profluens, et quae principem deceret, eloquentia fuit.* For if we note it well, speech that is uttered with labour and difficulty, or speech that savoureth of the affectation of art and precepts, or speech that is framed after the imitation of some pattern of eloquence, though never so excellent; all this hath somewhat servile, and holding of the subject. But your Majesty's manner of speech is, indeed, prince-like, flowing as from a fountain, and yet streaming and branching itself into Nature's order, full of facility and felicity, imitating none, and inimitable by any. And as in your civil estate there appeareth to be an emulation and contention of your Majesty's virtue with your fortune; a virtuous disposition with a fortunate regiment; a virtuous expectation (when time was) of your greater fortune, with a prosperous possession thereof in the due time; a virtuous observation of the laws of marriage, with most blessed and happy fruit of marriage; a virtuous and most Christian desire of peace, with a fortunate inclination in your neighbour princes thereunto: so likewise in these intellectual matters there seemeth to be no less contention between the excellency of your Majesty's gifts of Nature and the universality and perfection of your learning. For I am well assured that this which I shall say is no amplification at all, but a positive and measured truth; which is, that there hath not been since Christ's time any king or temporal monarch which hath been so learned in all literature and erudition, divine and human. For let a man seriously and diligently revolve and peruse the succession of the Emperors of Rome, of which Caesar the Dictator (who lived some years before Christ) and Marcus Antoninus were the best learned, and so descend to the Emperors of Graecia, or of the West, and then to the lines of France, Spain, England, Scotland, and the rest, and he shall find this judgment is truly made. For it seemeth much in a king if, by the compendious extractions of other men's wits and labours, he can take hold of any superficial ornaments and shows of learning, or if he countenance and prefer learning and learned men; but to drink, indeed, of the true fountains of learning--nay, to have such a fountain of learning

in himself, in a king, and in a king born--is almost a miracle. And the more, because there is met in your Majesty a rare conjunction, as well of divine and sacred literature as of profane and human; so as your Majesty standeth invested of that triplicity, which in great veneration was ascribed to the ancient Hermes: the power and fortune of a king, the knowledge and illumination of a priest, and the learning and universality of a philosopher. This propriety inherent and individual attribute in your Majesty deserveth to be expressed not only in the fame and admiration of the present time, nor in the history or tradition of the ages succeeding, but also in some solid work, fixed memorial, and immortal monument, bearing a character or signature both of the power of a king and the difference and perfection of such a king.

Therefore I did conclude with myself that I could not make unto your Majesty a better oblation than of some treatise tending to that end, whereof the sum will consist of these two parts: the former concerning the excellency of learning and knowledge, and the excellency of the merit and true glory in the augmentation and propagation thereof; the latter, what the particular acts and works are which have been embraced and undertaken for the advancement of learning; and again, what defects and undervalues I find in such particular acts: to the end that though I cannot positively or affirmatively advise your Majesty, or propound unto you framed particulars, yet I may excite your princely cogitations to visit the excellent treasure of your own mind, and thence to extract particulars for this purpose agreeable to your magnanimity and wisdom.

I. (1) In the entrance to the former of these--to clear the way and, as it were, to make silence, to have the true testimonies concerning the dignity of learning to be better heard, without the interruption of tacit objections--I think good to deliver it from the discredits and disgraces which it hath received, all from ignorance, but ignorance severally disguised; appearing sometimes in the zeal and jealousy of divines, sometimes in the severity and arrogancy of politics, and sometimes in the errors and imperfections of learned men themselves.

(2) I hear the former sort say that knowledge is of those things which are to be accepted of with great limitation and caution; that the aspiring to overmuch knowledge was the original temptation and sin whereupon ensued the fall of man; that knowledge hath in it somewhat of the serpent, and, therefore, where it entereth into a man it makes him swell; *Scientia inflat*; that Solomon gives a censure, "That there is no end of making books, and that much reading is weariness of the flesh;" and again in another place, "That in spacious knowledge there is much contristation, and that he that increaseth knowledge increaseth anxiety;" that Saint Paul gives a caveat, "That we be not spoiled through vain philosophy;" that experience demonstrates how learned men have been arch-heretics, how learned times have been inclined to atheism, and how the contemplation of second causes doth derogate from our dependence upon God, who is the first cause.

(3) To discover, then, the ignorance and error of this opinion, and the misunderstanding in the grounds thereof, it may well appear these men do not observe or consider that it was not the pure knowledge of Nature and universality, a knowledge by the light

whereof man did give names unto other creatures in Paradise as they were brought before him according unto their proprieties, which gave the occasion to the fall; but it was the proud knowledge of good and evil, with an intent in man to give law unto himself, and to depend no more upon God's commandments, which was the form of the temptation. Neither is it any quantity of knowledge, how great soever, that can make the mind of man to swell; for nothing can fill, much less extend the soul of man, but God and the contemplation of God; and, therefore, Solomon, speaking of the two principal senses of inquisition, the eye and the ear, affirmeth that the eye is never satisfied with seeing, nor the ear with hearing; and if there be no fulness, then is the continent greater than the content: so of knowledge itself and the mind of man, whereto the senses are but reporters, he defineth likewise in these words, placed after that calendar or ephemerides which he maketh of the diversities of times and seasons for all actions and purposes, and concludeth thus: "God hath made all things beautiful, or decent, in the true return of 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"--declaring not obscurely that God hath framed the mind of man as a mirror or glass, capable of the image of the universal world, and joyful to receive the impression thereof, as the eye joyeth to receive light; and not only delighted in beholding the variety of things and vicissitude of times, but raised also to find out and discern the ordinances and decrees which throughout all those changes are infallibly observed. And although he doth insinuate that the supreme or summary law of Nature (which he calleth "the work which God worketh from the beginning to the end") is not possible to be found out by man, yet that doth not derogate from the capacity of the mind; but may be referred to the impediments, as of shortness of life, ill conjunction of labours, ill tradition of knowledge over from hand to hand, and many other inconveniences, whereunto the condition of man is subject. For that nothing parcel of the world is denied to man's inquiry and invention, he doth in another place rule over, when he saith, "The spirit of man is as the lamp of God, wherewith He searcheth the inwardness of all secrets." If, then, such be the capacity and receipt of the mind of man, it is manifest that there is no danger at all in the proportion or quantity of knowledge, how large soever, lest it should make it swell or out-compass itself; no, but it is merely the quality of knowledge, which, be it in quantity more or less, if it be taken without the true corrective thereof, hath in it some nature of venom or malignity, and some effects of that venom, which is ventosity or swelling. This corrective spice, the mixture whereof maketh knowledge so sovereign, is charity, which the Apostle immediately addeth to the former clause; for so he saith, "Knowledge bloweth up, but charity buildeth up;" not unlike unto that which he delivereth in another place: "If I spake," saith he, "with the tongues of men and angels, and had not charity, it were but as a tinkling cymbal." Not but that it is an excellent thing to speak with the tongues of men and angels, but because, if it be severed from charity, and not referred to the good of men and mankind, it hath rather a sounding and unworthy glory than a meriting and substantial virtue. And as for that censure of Solomon concerning the excess of writing and reading books, and the anxiety of spirit which redoundeth from knowledge, and that admonition of St. Paul, "That we be not seduced by vain philosophy," let those places be rightly understood; and they do, indeed, excellently set forth the true bounds and limitations whereby human knowledge is confined and

circumscribed, and yet without any such contracting or coarctation, but that it may comprehend all the universal nature of things; for these limitations are three: the first, "That we do not so place our felicity in knowledge, as we forget our mortality;" the second, "That we make application of our knowledge, to give ourselves repose and contentment, and not distaste or repining;" the third, "That we do not presume by the contemplation of Nature to attain to the mysteries of God." For as touching the first of these, Solomon doth excellently expound himself in another place of the same book, where he saith: "I saw well that knowledge recedeth as far from ignorance as light doth from darkness; and that the wise man's eyes keep watch in his head, whereas this fool roundeth about in darkness: but withal I learned that the same mortality involveth them both." And for the second, certain it is there is no vexation or anxiety of mind which resulteth from knowledge otherwise than merely by accident; for all knowledge and wonder (which is the seed of knowledge) is an impression of pleasure in itself; but when men fall to framing conclusions out of their knowledge, applying it to their particular, and ministering to themselves thereby weak fears or vast desires, there groweth that carefulness and trouble of mind which is spoken of; for then knowledge is no more *Lumen siccum*, whereof Heraclitus the profound said, *Lumen siccum optima anima*; but it becometh *Lumen madidum*, or *maceratum*, being steeped and infused in the humours of the affections. And as for the third point, it deserveth to be a little stood upon, and not to be lightly passed over; for if any man shall think by view and inquiry into these sensible and material things to attain that light, whereby he may reveal unto himself the nature or will of God, then, indeed, is he spoiled by vain philosophy; for the contemplation of God's creatures and works produceth (having regard to the works and creatures themselves) knowledge, but having regard to God no perfect knowledge, but wonder, which is broken knowledge. And, therefore, it was most aptly said by one of Plato's school, "That the sense of man carrieth a resemblance with the sun, which (as we see) openeth and revealeth all the terrestrial globe; but then, again, it obscureth and concealeth the stars and celestial globe: so doth the sense discover natural things, but it darkeneth and shutteth up divine." And hence it is true that it hath proceeded, that divers great learned men have been heretical, whilst they have sought to fly up to the secrets of the Deity by this waxen wings of the senses. And as for the conceit that too much knowledge should incline a man to atheism, and that the ignorance of second causes should make a more devout dependence upon God, which is the first cause; first, it is good to ask the question which Job asked of his friends: "Will you lie for God, as one man will lie for another, to gratify him?" For certain it is that God worketh nothing in Nature but by second causes; and if they would have it otherwise believed, it is mere imposture, as it were in favour towards God, and nothing else but to offer to the Author of truth the unclean sacrifice of a lie. But further, it is an assured truth, and a conclusion of experience, that a little or superficial knowledge of philosophy may incline the mind of men to atheism, but a further proceeding therein doth bring the mind back again to religion. For in the entrance of philosophy, when the second causes, which are next unto the senses, do offer themselves to the mind of man, if it dwell and stay there it may induce some oblivion of the highest cause; but when a man passeth on further and seeth the dependence of causes and the works of Providence; then, according to the allegory of the poets, he will easily believe that the highest link of Nature's chain must needs be

tied to the foot of Jupiter's chair. To conclude, therefore, let no man upon a weak conceit of sobriety or an ill-applied moderation think or maintain that a man can search too far, or be too well studied in the book of God's word, or in the book of God's works, divinity or philosophy; but rather let men endeavour an endless progress or proficience in both; only let men beware that they apply both to charity, and not to swelling; to use, and not to ostentation; and again, that they do not unwisely mingle or confound these learnings together.

II. (1) And as for the disgraces which learning receiveth from politics, they be of this nature: that learning doth soften men's minds, and makes them more unapt for the honour and exercise of arms; that it doth mar and pervert men's dispositions for matter of government and policy, in making them too curious and irresolute by variety of reading, or too peremptory or positive by strictness of rules and axioms, or too immoderate and overweening by reason of the greatness of examples, or too incompatible and differing from the times by reason of the dissimilitude of examples; or at least, that it doth divert men's travails from action and business, and bringeth them to a love of leisure and privateness; and that it doth bring into states a relaxation of discipline, whilst every man is more ready to argue than to obey and execute. Out of this conceit Cato, surnamed the Censor, one of the wisest men indeed that ever lived, when Carneades the philosopher came in embassage to Rome, and that the young men of Rome began to flock about him, being allured with the sweetness and majesty of his eloquence and learning, gave counsel in open senate that they should give him his despatch with all speed, lest he should infect and enchant the minds and affections of the youth, and at unawares bring in an alteration of the manners and customs of the state. Out of the same conceit or humour did Virgil, turning his pen to the advantage of his country and the disadvantage of his own profession, make a kind of separation between policy and government, and between arts and sciences, in the verses so much renowned, attributing and challenging the one to the Romans, and leaving and yielding the other to the Grecians: *Tu regere imperio popules, Romane, memento, Hae tibi erunt artes, &c.* So likewise we see that Anytus, the accuser of Socrates, laid it as an article of charge and accusation against him, that he did, with the variety and power of his discourses and disputations, withdraw young men from due reverence to the laws and customs of their country, and that he did profess a dangerous and pernicious science, which was to make the worse matter seem the better, and to suppress truth by force of eloquence and speech.

(2) But these and the like imputations have rather a countenance of gravity than any ground of justice: for experience doth warrant that, both in persons and in times, there hath been a meeting and concurrence in learning and arms, flourishing and excelling in the same men and the same ages. For as 'for men, there cannot be a better nor the like instance as of that pair, Alexander the Great and Julius Caesar, the Dictator; whereof the one was Aristotle's scholar in philosophy, and the other was Cicero's rival in eloquence; or if any man had rather call for scholars that were great generals, than generals that were great scholars, let him take Epaminondas the Theban, or Xenophon the Athenian; whereof the one was the first that abated the power of Sparta, and the other was the first that made way to the overthrow of the monarchy of Persia. And

this concurrence is yet more visible in times than in persons, by how much an age is greater object than a man. For both in Egypt, Assyria, Persia, Graecia, and Rome, the same times that are most renowned for arms are, likewise, most admired for learning, so that the greatest authors and philosophers, and the greatest captains and governors, have lived in the same ages. Neither can it otherwise be: for as in man the ripeness of strength of the body and mind cometh much about an age, save that the strength of the body cometh somewhat the more early, so in states, arms and learning, whereof the one correspondeth to the body, the other to the soul of man, have a concurrence or near sequence in times.

(3) And for matter of policy and government, that learning, should rather hurt, than enable thereunto, is a thing very improbable; we see it is accounted an error to commit a natural body to empiric physicians, which commonly have a few pleasing receipts whereupon they are confident and adventurous, but know neither the causes of diseases, nor the complexions of patients, nor peril of accidents, nor the true method of cures; we see it is a like error to rely upon advocates or lawyers which are only men of practice, and not grounded in their books, who are many times easily surprised when matter falleth out besides their experience, to the prejudice of the causes they handle: so by like reason it cannot be but a matter of doubtful consequence if states be managed by empiric statesmen, not well mingled with men grounded in learning. But contrariwise, it is almost without instance contradictory that ever any government was disastrous that was in the hands of learned governors. For howsoever it hath been ordinary with politic men to extenuate and disable learned men by the names of pedantes; yet in the records of time it appeareth in many particulars that the governments of princes in minority (notwithstanding the infinite disadvantage of that kind of state)--have nevertheless excelled the government of princes of mature age, even for that reason which they seek to traduce, which is that by that occasion the state hath been in the hands of pedantes: for so was the state of Rome for the first five years, which are so much magnified, during the minority of Nero, in the hands of Seneca, a pedanti; so it was again, for ten years' space or more, during the minority of Gordianus the younger, with great applause and contentation in the hands of Mithras, a pedanti: so was it before that, in the minority of Alexander Severus, in like happiness, in hands not much unlike, by reason of the rule of the women, who were aided by the teachers and preceptors. Nay, let a man look into the government of the Bishops of Rome, as by name, into the government of Pius Quintus and Sextus Quintus in our times, who were both at their entrance esteemed but as pedantical friars, and he shall find that such Popes do greater things, and proceed upon truer principles of state, than those which have ascended to the papacy from an education and breeding in affairs of state and courts of princes; for although men bred in learning are perhaps to seek in points of convenience and accommodating for the present, which the Italians call *ragioni di stato*, whereof the same Pius Quintus could not hear spoken with patience, terming them inventions against religion and the moral virtues; yet on the other side, to recompense that, they are perfect in those same plain grounds of religion, justice, honour, and moral virtue, which if they be well and watchfully pursued, there will be seldom use of those other, no more than of physic in a sound or well-dieted body. Neither can the experience of one man's life furnish examples and precedents for the event of one man's life.

For as it happeneth sometimes that the grandchild, or other descendant, resembleth the ancestor more than the son; so many times occurrences of present times may sort better with ancient examples than with those of the later or immediate times; and lastly, the wit of one man can no more countervail learning than one man's means can hold way with a common purse.

(4) And as for those particular seducements or indispositions of the mind for policy and government, which learning is pretended to insinuate; if it be granted that any such thing be, it must be remembered withal that learning ministereth in every of them greater strength of medicine or remedy than it offereth cause of indisposition or infirmity. For if by a secret operation it make men perplexed and irresolute, on the other side by plain precept it teacheth them when and upon what ground to resolve; yea, and how to carry things in suspense, without prejudice, till they resolve. If it make men positive and regular, it teacheth them what things are in their nature demonstrative, and what are conjectural, and as well the use of distinctions and exceptions, as the latitude of principles and rules. If it mislead by disproportion or dissimilitude of examples, it teacheth men the force of circumstances, the errors of comparisons, and all the cautions of application; so that in all these it doth rectify more effectually than it can pervert. And these medicines it conveyeth into men's minds much more forcibly by the quickness and penetration of examples. For let a man look into the errors of Clement VII., so lively described by Guicciardini, who served under him, or into the errors of Cicero, painted out by his own pencil in his Epistles to Atticus, and he will fly apace from being irresolute. Let him look into the errors of Phocion, and he will beware how he be obstinate or inflexible. Let him but read the fable of Ixion, and it will hold him from being vaporous or imaginative. Let him look into the errors of Cato II., and he will never be one of the Antipodes, to tread opposite to the present world.

(5) And for the conceit that learning should dispose men to leisure and privateness, and make men slothful: it were a strange thing if that which accustometh the mind to a perpetual motion and agitation should induce slothfulness, whereas, contrariwise, it may be truly affirmed that no kind of men love business for itself but those that are learned; for other persons love it for profit, as a hireling that loves the work for the wages; or for honour, as because it beareth them up in the eyes of men, and refresheth their reputation, which otherwise would wear; or because it putteth them in mind of their fortune, and giveth them occasion to pleasure and displeasure; or because it exerciseth some faculty wherein they take pride, and so entertaineth them in good-humour and pleasing conceits towards themselves; or because it advanceth any other their ends. So that as it is said of untrue valours, that some men's valours are in the eyes of them that look on, so such men's industries are in the eyes of others, or, at least, in regard of their own designments; only learned men love business as an action according to nature, as agreeable to health of mind as exercise is to health of body, taking pleasure in the action itself, and not in the purchase, so that of all men they are the most indefatigable, if it be towards any business which can hold or detain their mind.

(6) And if any man be laborious in reading and study, and yet idle in business and action, it groweth from some weakness of body or

softness of spirit, such as Seneca speaketh of: Quidam tam sunt umbratiles, ut putent in turbido esse quicquid in luce est; and not of learning: well may it be that such a point of a man's nature may make him give himself to learning, but it is not learning that breedeth any such point in his nature.

(7) And that learning should take up too much time or leisure: I answer, the most active or busy man that hath been or can be, hath (no question) many vacant times of leisure while he expecteth the tides and returns of business (except he be either tedious and of no despatch, or lightly and unworthily ambitious to meddle in things that may be better done by others), and then the question is but how those spaces and times of leisure shall be filled and spent; whether in pleasure or in studies; as was well answered by Demosthenes to his adversary AEschines, that was a man given to pleasure, and told him "That his orations did smell of the lamp." "Indeed," said Demosthenes, "there is a great difference between the things that you and I do by lamp-light." So as no man need doubt that learning will expel business, but rather it will keep and defend the possession of the mind against idleness and pleasure, which otherwise at unawares may enter to the prejudice of both.

(8) Again, for that other conceit that learning should undermine the reverence of laws and government, it is assuredly a mere depravation and calumny, without all shadow of truth. For to say that a blind custom of obedience should be a surer obligation than duty taught and understood, it is to affirm that a blind man may tread surer by a guide than a seeing man can by a light. And it is without all controversy that learning doth make the minds of men gentle, generous, manageable, and pliant to government; whereas ignorance makes them churlish, thwart, and mutinous: and the evidence of time doth clear this assertion, considering that the most barbarous, rude, and unlearned times have been most subject to tumults, seditious, and changes.

(9) And as to the judgment of Cato the Censor, he was well punished for his blasphemy against learning, in the same kind wherein he offended; for when he was past threescore years old, he was taken with an extreme desire to go to school again, and to learn the Greek tongue, to the end to peruse the Greek authors; which doth well demonstrate that his former censure of the Grecian learning was rather an affected gravity, than according to the inward sense of his own opinion. And as for Virgil's verses, though it pleased him to brave the world in taking to the Romans the art of empire, and leaving to others the arts of subjects, yet so much is manifest--that the Romans never ascended to that height of empire till the time they had ascended to the height of other arts. For in the time of the two first Caesars, which had the art of government in greatest perfection, there lived the best poet, Virgilius Maro; the best historiographer, Titus Livius; the best antiquary, Marcus Varro; and the best or second orator, Marcus Cicero, that to the memory of man are known. As for the accusation of Socrates, the time must be remembered when it was prosecuted; which was under the Thirty Tyrants, the most base, bloody, and envious persons that have governed; which revolution of state was no sooner over but Socrates, whom they had made a person criminal, was made a person heroical, and his memory accumulate with honours divine and human; and those discourses of his which were then termed corrupting of manners, were after acknowledged for sovereign medicines of the mind and manners,

and so have been received ever since till this day. Let this, therefore, serve for answer to politiques, which in their humorous severity, or in their feigned gravity, have presumed to throw imputations upon learning; which redargution nevertheless (save that we know not whether our labours may extend to other ages) were not needful for the present, in regard of the love and reverence towards learning which the example and countenance of two so learned princes, Queen Elizabeth and your Majesty, being as Castor and Pollux, lucida sidera, stars of excellent light and most benign influence, hath wrought in all men of place and authority in our nation.

III. (1) Now therefore we come to that third sort of discredit or diminution of credit that groweth unto learning from learned men themselves, which commonly cleaveth fastest: it is either from their fortune, or from their manners, or from the nature of their studies. For the first, it is not in their power; and the second is accidental; the third only is proper to be handled: but because we are not in hand with true measure, but with popular estimation and conceit, it is not amiss to speak somewhat of the two former. The derogations therefore which grow to learning from the fortune or condition of learned men, are either in respect of scarcity of means, or in respect of privateness of life and meanness of employments.

(2) Concerning want, and that it is the case of learned men usually to begin with little, and not to grow rich so fast as other men, by reason they convert not their labours chiefly to lucre and increase, it were good to leave the commonplace in commendation of poverty to some friar to handle, to whom much was attributed by Machiavel in this point when he said, "That the kingdom of the clergy had been long before at an end, if the reputation and reverence towards the poverty of friars had not borne out the scandal of the superfluities and excesses of bishops and prelates." So a man might say that the felicity and delicacy of princes and great persons had long since turned to rudeness and barbarism, if the poverty of learning had not kept up civility and honour of life; but without any such advantages, it is worthy the observation what a reverent and honoured thing poverty of fortune was for some ages in the Roman state, which nevertheless was a state without paradoxes. For we see what Titus Livius saith in his introduction: *Caeterum aut me amor negotii suscepti fallit aut nulla unquam respublica nec major, nec sanctor, nec bonis exemplis ditior fuit; nec in quam tam sero avaritia luxuriaque immigraverint; nec ubi tantus ac tam diu paupertati ac parsimoniae honos fuerit.* We see likewise, after that the state of Rome was not itself, but did degenerate, how that person that took upon him to be counsellor to Julius Caesar after his victory where to begin his restoration of the state, maketh it of all points the most summary to take away the estimation of wealth: *Verum haec et omnia mala pariter cum honore pecuniae desinent; si neque magistratus, neque alia vulgo cupienda, venalia erunt.* To conclude this point: as it was truly said that *Paupertas est virtutis fortuna*, though sometimes it come from vice, so it may be fitly said that, though some times it may proceed from misgovernment and accident. Surely Solomon hath pronounced it both in censure, *Qui festinat ad divitias non erit insons;* and in precept, "Buy the truth, and sell it not; and so of wisdom and knowledge;" judging that means were to be spent upon learning, and not learning to be applied to means. And as for the privateness or

obscurity (as it may be in vulgar estimation accounted) of life of contemplative men, it is a theme so common to extol a private life, not taxed with sensuality and sloth, in comparison and to the disadvantage of a civil life, for safety, liberty, pleasure, and dignity, or at least freedom from indignity, as no man handleth it but handleth it well; such a consonancy it hath to men's conceits in the expressing, and to men's consents in the allowing. This only I will add, that learned men forgotten in states and not living in the eyes of men, are like the images of Cassius and Brutus in the funeral of Junia, of which, not being represented as many others were, Tacitus saith, *Eo ipso praefergebant quod non visebantur*.

(3) And for meanness of employment, that which is most traduced to contempt is that the government of youth is commonly allotted to them; which age, because it is the age of least authority, it is transferred to the disesteeming of those employments wherein youth is conversant, and which are conversant about youth. But how unjust this traducement is (if you will reduce things from popularity of opinion to measure of reason) may appear in that we see men are more curious what they put into a new vessel than into a vessel seasoned; and what mould they lay about a young plant than about a plant corroborate; so as this weakest terms and times of all things use to have the best applications and helps. And will you hearken to the Hebrew rabbins? "Your young men shall see visions, and your old men shall dream dreams:" say they, youth is the worthier age, for that visions are nearer apparitions of God than dreams? And let it be noted that howsoever the condition of life of pedantes hath been scorned upon theatres, as the ape of tyranny; and that the modern looseness or negligence hath taken no due regard to the choice of schoolmasters and tutors; yet the ancient wisdom of the best times did always make a just complaint, that states were too busy with their laws and too negligent in point of education: which excellent part of ancient discipline hath been in some sort revived of late times by the colleges of the Jesuits; of whom, although in regard of their superstition I may say, *Quo meliores, eo deteriores*; yet in regard of this, and some other points concerning human learning and moral matters, I may say, as Agesilaus said to his enemy Pharnabazus, *Talis quum sis, utunam noster esses*. And that much touching the discredits drawn from the fortunes of learned men.

(4) As touching the manners of learned men, it is a thing personal and individual: and no doubt there be amongst them, as in other professions, of all temperatures: but yet so as it is not without truth which is said, that *Abeunt studia in mores*, studies have an influence and operation upon the manners of those that are conversant in them.

(5) But upon an attentive and indifferent review, I for my part cannot find any disgrace to learning can proceed from the manners of learned men; not inherent to them as they are learned; except it be a fault (which was the supposed fault of Demosthenes, Cicero, Cato II., Seneca, and many more) that because the times they read of are commonly better than the times they live in, and the duties taught better than the duties practised, they contend sometimes too far to bring things to perfection, and to reduce the corruption of manners to honesty of precepts or examples of too great height. And yet hereof they have caveats enough in their own walks. For Solon, when he was asked whether he had given his citizens the best laws, answered wisely, "Yea, of such as they would receive:" and Plato,

finding that his own heart could not agree with the corrupt manners of his country, refused to bear place or office, saying, "That a man's country was to be used as his parents were, that is, with humble persuasions, and not with contestations." And Caesar's counsellor put in the same caveat, *Non ad vetera instituta revocans quae jam pridem corruptis moribus ludibrio sunt*; and Cicero noteth this error directly in Cato II. when he writes to his friend Atticus, *Cato optime sentit, sed nocet interdum reipublicae; loquitur enim tanquam in republica Platonis, non tanquam in faece Romuli*. And the same Cicero doth excuse and expound the philosophers for going too far and being too exact in their precepts when he saith, *Isti ipse praeceptores virtutis et magistri videntur fines officiorum paulo longius quam natura vellet protulisse, ut cum ad ultimum animo contendissemus, ibi tamen, ubi oportet, consisteremus*: and yet himself might have said, *Monitis sum minor ipse meis*; for it was his own fault, though not in so extreme a degree.

(6) Another fault likewise much of this kind hath been incident to learned men, which is, that they have esteemed the preservation, good, and honour of their countries or masters before their own fortunes or safeties. For so saith Demosthenes unto the Athenians: "If it please you to note it, my counsels unto you are not such whereby I should grow great amongst you, and you become little amongst the Grecians; but they be of that nature as they are sometimes not good for me to give, but are always good for you to follow." And so Seneca, after he had consecrated that Quinquennium Neronis to the eternal glory of learned governors, held on his honest and loyal course of good and free counsel after his master grew extremely corrupt in his government. Neither can this point otherwise be, for learning endueth men's minds with a true sense of the frailty of their persons, the casualty of their fortunes, and the dignity of their soul and vocation, so that it is impossible for them to esteem that any greatness of their own fortune can be a true or worthy end of their being and ordainment, and therefore are desirous to give their account to God, and so likewise to their masters under God (as kings and the states that they serve) in those words, *Ecce tibi lucre feci*, and not *Ecce mihi lucre feci*; whereas the corrupter sort of mere politiques, that have not their thoughts established by learning in the love and apprehension of duty, nor never look abroad into universality, do refer all things to themselves, and thrust themselves into the centre of the world, as if all lines should meet in them and their fortunes, never caring in all tempests what becomes of the ship of state, so they may save themselves in the cockboat of their own fortune; whereas men that feel the weight of duty and know the limits of self-love use to make good their places and duties, though with peril; and if they stand in seditious and violent alterations, it is rather the reverence which many times both adverse parts do give to honesty, than any versatile advantage of their own carriage. But for this point of tender sense and fast obligation of duty which learning doth endue the mind withal, howsoever fortune may tax it, and many in the depth of their corrupt principles may despise it, yet it will receive an open allowance, and therefore needs the less disproof or excuse.

(7) Another fault incident commonly to learned men, which may be more properly defended than truly denied, is that they fail sometimes in applying themselves to particular persons, which want of exact application ariseth from two causes--the one, because the

largeness of their mind can hardly confine itself to dwell in the exquisite observation or examination of the nature and customs of one person, for it is a speech for a lover, and not for a wise man, *Satis magnum alter alteri theatrum sumus*. Nevertheless I shall yield that he that cannot contract the sight of his mind as well as disperse and dilate it, wanteth a great faculty. But there is a second cause, which is no inability, but a rejection upon choice and judgment. For the honest and just bounds of observation by one person upon another extend no further but to understand him sufficiently, whereby not to give him offence, or whereby to be able to give him faithful counsel, or whereby to stand upon reasonable guard and caution in respect of a man's self. But to be speculative into another man to the end to know how to work him, or wind him, or govern him, proceedeth from a heart that is double and cloven, and not entire and ingenuous; which as in friendship it is want of integrity, so towards princes or superiors is want of duty. For the custom of the Levant, which is that subjects do forbear to gaze or fix their eyes upon princes, is in the outward ceremony barbarous, but the moral is good; for men ought not, by cunning and bent observations, to pierce and penetrate into the hearts of kings, which the Scripture hath declared to be inscrutable.

(8) There is yet another fault (with which I will conclude this part) which is often noted in learned men, that they do many times fail to observe decency and discretion in their behaviour and carriage, and commit errors in small and ordinary points of action, so as the vulgar sort of capacities do make a judgment of them in greater matters by that which they find wanting in them in smaller. But this consequence doth oft deceive men, for which I do refer them over to that which was said by Themistocles, arrogantly and uncivilly being applied to himself out of his own mouth, but, being applied to the general state of this question, pertinently and justly, when, being invited to touch a lute, he said, "He could not fiddle, but he could make a small town a great state." So no doubt many may be well seen in the passages of government and policy which are to seek in little and punctual occasions. I refer them also to that which Plato said of his master Socrates, whom he compared to the gallipots of apothecaries, which on the outside had apes and owls and antiques, but contained within sovereign and precious liquors and confections; acknowledging that, to an external report, he was not without superficial levities and deformities, but was inwardly replenished with excellent virtues and powers. And so much touching the point of manners of learned men.

(9) But in the meantime I have no purpose to give allowance to some conditions and courses base and unworthy, wherein divers professors of learning have wronged themselves and gone too far; such as were those trencher philosophers which in the later age of the Roman state were usually in the houses of great persons, being little better than solemn parasites, of which kind, Lucian maketh a merry description of the philosopher that the great lady took to ride with her in her coach, and would needs have him carry her little dog, which he doing officiously and yet uncomely, the page scoffed and said, "That he doubted the philosopher of a Stoic would turn to be a Cynic." But, above all the rest, this gross and palpable flattery whereunto many not unlearned have abased and abused their wits and pens, turning (as Du Bartas saith) Hecuba into Helena, and Faustina into Lucretia, hath most diminished the price and estimation of learning. Neither is the modern dedication of books and writings,

as to patrons, to be commended, for that books (such as are worthy the name of books) ought to have no patrons but truth and reason. And the ancient custom was to dedicate them only to private and equal friends, or to entitle the books with their names; or if to kings and great persons, it was to some such as the argument of the book was fit and proper for; but these and the like courses may deserve rather reprehension than defence.

(10) Not that I can tax or condemn the morigeration or application of learned men to men in fortune. For the answer was good that Diogenes made to one that asked him in mockery, "How it came to pass that philosophers were the followers of rich men, and not rich men of philosophers?" He answered soberly, and yet sharply, "Because the one sort knew what they had need of, and the other did not." And of the like nature was the answer which Aristippus made, when having a petition to Dionysius, and no ear given to him, he fell down at his feet, whereupon Dionysius stayed and gave him the hearing, and granted it; and afterwards some person, tender on the behalf of philosophy, reprov'd Aristippus that he would offer the profession of philosophy such an indignity as for a private suit to fall at a tyrant's feet; but he answered, "It was not his fault, but it was the fault of Dionysius, that had his ears in his feet." Neither was it accounted weakness, but discretion, in him that would not dispute his best with Adrianus Caesar, excusing himself, "That it was reason to yield to him that commanded thirty legions." These and the like, applications, and stooping to points of necessity and convenience, cannot be disallowed; for though they may have some outward baseness, yet in a judgment truly made they are to be accounted submissions to the occasion and not to the person.

IV. (1) Now I proceed to those errors and vanities which have interv'ned amongst the studies themselves of the learned, which is that which is principal and proper to the present argument; wherein my purpose is not to make a justification of the errors, but by a censure and separation of the errors to make a justification of that which is good and sound, and to deliver that from the aspersion of the other. For we see that it is the manner of men to scandalise and deprave that which retaineth the state and virtue, by taking advantage upon that which is corrupt and degenerate, as the heathens in the primitive Church used to blemish and taint the Christians with the faults and corruptions of heretics. But nevertheless I have no meaning at this time to make any exact animadversion of the errors and impediments in matters of learning, which are more secret and remote from vulgar opinion, but only to speak unto such as do fall under or near unto a popular observation.

(2) There be therefore chiefly three vanities in studies, whereby learning hath been most traduced. For those things we do esteem vain which are either false or frivolous, those which either have no truth or no use; and those persons we esteem vain which are either credulous or curious; and curiosity is either in matter or words: so that in reason as well as in experience there fall out to be these three distempers (as I may term them) of learning--the first, fantastical learning; the second, contentious learning; and the last, delicate learning; vain imaginations, vain altercations, and vain affectations; and with the last I will begin. Martin Luther, conducted, no doubt, by a higher Providence, but in discourse of reason, finding what a province he had undertaken against the Bishop of Rome and the degenerate traditions of the Church, and finding his

own solitude, being in nowise aided by the opinions of his own time, was enforced to awake all antiquity, and to call former times to his succours to make a party against the present time. So that the ancient authors, both in divinity and in humanity, which had long time slept in libraries, began generally to be read and revolved. This, by consequence, did draw on a necessity of a more exquisite travail in the languages original, wherein those authors did write, for the better understanding of those authors, and the better advantage of pressing and applying their words. And thereof grew, again, a delight in their manner of style and phrase, and an admiration of that kind of writing, which was much furthered and precipitated by the enmity and opposition that the propounders of those primitive but seeming new opinions had against the schoolmen, who were generally of the contrary part, and whose writings were altogether in a differing style and form; taking liberty to coin and frame new terms of art to express their own sense, and to avoid circuit of speech, without regard to the pureness, pleasantness, and (as I may call it) lawfulness of the phrase or word. And again, because the great labour then was with the people (of whom the Pharisees were wont to say, *Execrabilis ista turba, quae non novit legem*), for the winning and persuading of them, there grew of necessity in chief price and request eloquence and variety of discourse, as the fittest and forciblest access into the capacity of the vulgar sort; so that these four causes concurring--the admiration of ancient authors, the hate of the schoolmen, the exact study of languages, and the efficacy of preaching--did bring in an affectionate study of eloquence and copy of speech, which then began to flourish. This grew speedily to an excess; for men began to hunt more after words than matter--more after the choiceness of the phrase, and the round and clean composition of the sentence, and the sweet falling of the clauses, and the varying and illustration of their works with tropes and figures, than after the weight of matter, worth of subject, soundness of argument, life of invention, or depth of judgment. Then grew the flowing and watery vein of Osorius, the Portugal bishop, to be in price. Then did Sturmius spend such infinite and curious pains upon Cicero the Orator and Hermogenes the Rhetorician, besides his own books of Periods and Imitation, and the like. Then did Car of Cambridge and Ascham with their lectures and writings almost deify Cicero and Demosthenes, and allure all young men that were studious unto that delicate and polished kind of learning. Then did Erasmus take occasion to make the scoffing echo, *Decem annos consumpsi in legendo Cicerone*; and the echo answered in Greek, *One, Asine*. Then grew the learning of the schoolmen to be utterly despised as barbarous. In sum, the whole inclination and bent of those times was rather towards copy than weight.

(3) Here therefore [is] the first distemper of learning, when men study words and not matter; whereof, though I have represented an example of late times, yet it hath been and will be *secundum majus et minus* in all time. And how is it possible but this should have an operation to discredit learning, even with vulgar capacities, when they see learned men's works like the first letter of a patent or limited book, which though it hath large flourishes, yet it is but a letter? It seems to me that Pygmalion's frenzy is a good emblem or portraiture of this vanity; for words are but the images of matter, and except they have life of reason and invention, to fall in love with them is all one as to fall in love with a picture.

(4) But yet notwithstanding it is a thing not hastily to be condemned, to clothe and adorn the obscurity even of philosophy itself with sensible and plausible elocution. For hereof we have great examples in Xenophon, Cicero, Seneca, Plutarch, and of Plato also in some degree; and hereof likewise there is great use, for surely, to the severe inquisition of truth and the deep progress into philosophy, it is some hindrance because it is too early satisfactory to the mind of man, and quencheth the desire of further search before we come to a just period. But then if a man be to have any use of such knowledge in civil occasions, of conference, counsel, persuasion, discourse, or the like, then shall he find it prepared to his hands in those authors which write in that manner. But the excess of this is so justly contemptible, that as Hercules, when he saw the image of Adonis, Venus' minion, in a temple, said in disdain, Nil sacri es; so there is none of Hercules' followers in learning--that is, the more severe and laborious sort of inquirers into truth--but will despise those delicacies and affectations, as indeed capable of no divineness. And thus much of the first disease or distemper of learning.

(5) The second which followeth is in nature worse than the former: for as substance of matter is better than beauty of words, so contrariwise vain matter is worse than vain words: wherein it seemeth the reprehension of St. Paul was not only proper for those times, but prophetic for the times following; and not only respective to divinity, but extensive to all knowledge: *Devita profanas vocum novitates, et oppositiones falsi nominis scientiae*. For he assigneth two marks and badges of suspected and falsified science: the one, the novelty and strangeness of terms; the other, the strictness of positions, which of necessity doth induce oppositions, and so questions and altercations. Surely, like as many substances in nature which are solid do putrefy and corrupt into worms;--so it is the property of good and sound knowledge to putrefy and dissolve into a number of subtle, idle, unwholesome, and (as I may term them) vermiculate questions, which have indeed a kind of quickness and life of spirit, but no soundness of matter or goodness of quality. This kind of degenerate learning did chiefly reign amongst the schoolmen, who having sharp and strong wits, and abundance of leisure, and small variety of reading, but their wits being shut up in the cells of a few authors (chiefly Aristotle their dictator) as their persons were shut up in the cells of monasteries and colleges, and knowing little history, either of nature or time, did out of no great quantity of matter and infinite agitation of wit spin out unto us those laborious webs of learning which are extant in their books. For the wit and mind of man, if it work upon matter, which is the contemplation of the creatures of God, worketh according to the stuff and is limited thereby; but if it work upon itself, as the spider worketh his web, then it is endless, and brings forth indeed cobwebs of learning, admirable for the fineness of thread and work, but of no substance or profit.

(6) This same unprofitable subtlety or curiosity is of two sorts: either in the subject itself that they handle, when it is a fruitless speculation or controversy (whereof there are no small number both in divinity and philosophy), or in the manner or method of handling of a knowledge, which amongst them was this--upon every particular position or assertion to frame objections, and to those objections, solutions; which solutions were for the most part not confutations, but distinctions: whereas indeed the strength of all

sciences is, as the strength of the old man's faggot, in the bond. For the harmony of a science, supporting each part the other, is and ought to be the true and brief confutation and suppression of all the smaller sort of objections. But, on the other side, if you take out every axiom, as the sticks of the faggot, one by one, you may quarrel with them and bend them and break them at your pleasure: so that, as was said of Seneca, *Verborum minutiis rerum frangit pondera*, so a man may truly say of the schoolmen, *Quaestionum minutiis scientiarum frangunt soliditatem*. For were it not better for a man in fair room to set up one great light, or branching candlestick of lights, than to go about with a small watch-candle into every corner? And such is their method, that rests not so much upon evidence of truth proved by arguments, authorities, similitudes, examples, as upon particular confutations and solutions of every scruple, cavillation, and objection; breeding for the most part one question as fast as it solveth another; even as in the former resemblance, when you carry the light into one corner, you darken the rest; so that the fable and fiction of Scylla seemeth to be a lively image of this kind of philosophy or knowledge; which was transformed into a comely virgin for the upper parts; but then *Candida succinctam latrantibus inguina monstribus*: so the generalities of the schoolmen are for a while good and proportionable; but then when you descend into their distinctions and decisions, instead of a fruitful womb for the use and benefit of man's life, they end in monstrous altercations and barking questions. So as it is not possible but this quality of knowledge must fall under popular contempt, the people being apt to contemn truths upon occasion of controversies and altercations, and to think they are all out of their way which never meet; and when they see such digladiation about subtleties, and matters of no use or moment, they easily fall upon that judgment of Dionysius of Syracuse, *Verba ista sunt senum otiosorum*.

(7) Notwithstanding, certain it is that if those schoolmen to their great thirst of truth and unwearied travail of wit had joined variety and universality of reading and contemplation, they had proved excellent lights, to the great advancement of all learning and knowledge; but as they are, they are great undertakers indeed, and fierce with dark keeping. But as in the inquiry of the divine truth, their pride inclined to leave the oracle of God's word, and to vanish in the mixture of their own inventions; so in the inquisition of nature, they ever left the oracle of God's works, and adored the deceiving and deformed images which the unequal mirror of their own minds, or a few received authors or principles, did represent unto them. And thus much for the second disease of learning.

(8) For the third vice or disease of learning, which concerneth deceit or untruth, it is of all the rest the foulest; as that which doth destroy the essential form of knowledge, which is nothing but a representation of truth: for the truth of being and the truth of knowing are one, differing no more than the direct beam and the beam reflected. This vice therefore brancheth itself into two sorts; delight in deceiving and aptness to be deceived; imposture and credulity; which, although they appear to be of a diverse nature, the one seeming to proceed of cunning and the other of simplicity, yet certainly they do for the most part concur: for, as the verse noteth -

"Percontatorem fugito, nam garrulus idem est,"

an inquisitive man is a prattler; so upon the like reason a credulous man is a deceiver: as we see it in fame, that he that will easily believe rumours will as easily augment rumours and add somewhat to them of his own; which Tacitus wisely noteth, when he saith, *Fingunt simul creduntque*: so great an affinity hath fiction and belief.

(9) This facility of credit and accepting or admitting things weakly authorised or warranted is of two kinds according to the subject: for it is either a belief of history, or, as the lawyers speak, matter of fact; or else of matter of art and opinion. As to the former, we see the experience and inconvenience of this error in ecclesiastical history; which hath too easily received and registered reports and narrations of miracles wrought by martyrs, hermits, or monks of the desert, and other holy men, and their relics, shrines, chapels and images: which though they had a passage for a time by the ignorance of the people, the superstitious simplicity of some and the politic toleration of others holding them but as divine poesies, yet after a period of time, when the mist began to clear up, they grew to be esteemed but as old wives' fables, impostures of the clergy, illusions of spirits, and badges of Antichrist, to the great scandal and detriment of religion.

(10) So in natural history, we see there hath not been that choice and judgment used as ought to have been; as may appear in the writings of Plinius, Cardanus, Albertus, and divers of the Arabians, being fraught with much fabulous matter, a great part not only untried, but notoriously untrue, to the great derogation of the credit of natural philosophy with the grave and sober kind of wits: wherein the wisdom and integrity of Aristotle is worthy to be observed, that, having made so diligent and exquisite a history of living creatures, hath mingled it sparingly with any vain or feigned matter; and yet on the other side hath cast all prodigious narrations, which he thought worthy the recording, into one book, excellently discerning that matter of manifest truth, such whereupon observation and rule was to be built, was not to be mingled or weakened with matter of doubtful credit; and yet again, that rarities and reports that seem incredible are not to be suppressed or denied to the memory of men.

(11) And as for the facility of credit which is yielded to arts and opinions, it is likewise of two kinds; either when too much belief is attributed to the arts themselves, or to certain authors in any art. The sciences themselves, which have had better intelligence and confederacy with the imagination of man than with his reason, are three in number: astrology, natural magic, and alchemy; of which sciences, nevertheless, the ends or pretences are noble. For astrology pretendeth to discover that correspondence or concatenation which is between the superior globe and the inferior; natural magic pretendeth to call and reduce natural philosophy from variety of speculations to the magnitude of works; and alchemy pretendeth to make separation of all the unlike parts of bodies which in mixtures of natures are incorporate. But the derivations and prosecutions to these ends, both in the theories and in the practices, are full of error and vanity; which the great professors

themselves have sought to veil over and conceal by enigmatical writings, and referring themselves to auricular traditions and such other devices, to save the credit of impostures. And yet surely to alchemy this right is due, that it may be compared to the husbandman whereof AEsop makes the fable; that, when he died, told his sons that he had left unto them gold buried underground in his vineyard; and they digged over all the ground, and gold they found none; but by reason of their stirring and digging the mould about the roots of their vines, they had a great vintage the year following: so assuredly the search and stir to make gold hath brought to light a great number of good and fruitful inventions and experiments, as well for the disclosing of nature as for the use of man's life.

(12) And as for the overmuch credit that hath been given unto authors in sciences, in making them dictators, that their words should stand, and not consuls, to give advice; the damage is infinite that sciences have received thereby, as the principal cause that hath kept them low at a stay without growth or advancement. For hence it hath come, that in arts mechanical the first deviser comes shortest, and time addeth and perfecteth; but in sciences the first author goeth furthest, and time leeseth and corrupteth. So we see artillery, sailing, printing, and the like, were grossly managed at the first, and by time accommodated and refined; but contrariwise, the philosophies and sciences of Aristotle, Plato, Democritus, Hippocrates, Euclides, Archimedes, of most vigour at the first, and by time degenerate and imbasd: whereof the reason is no other, but that in the former many wits and industries have contributed in one; and in the latter many wits and industries have been spent about the wit of some one, whom many times they have rather depraved than illustrated; for, as water will not ascend higher than the level of the first spring-head from whence it descendeth, so knowledge derived from Aristotle, and exempted from liberty of examination, will not rise again higher than the knowledge of Aristotle. And, therefore, although the position be good, *Oportet discentem credere*, yet it must be coupled with this, *Oportet edoctum iudicare*; for disciples do owe unto masters only a temporary belief and a suspension of their own judgment till they be fully instructed, and not an absolute resignation or perpetual captivity; and therefore, to conclude this point, I will say no more, but so let great authors have their due, as time, which is the author of authors, be not deprived of his due--which is, further and further to discover truth. Thus have I gone over these three diseases of learning; besides the which there are some other rather peccant humours than formed diseases, which, nevertheless, are not so secret and intrinsic, but that they fall under a popular observation and traducement, and, therefore, are not to be passed over.

V. (1) The first of these is the extreme affecting of two extremities: the one antiquity, the other novelty; wherein it seemeth the children of time do take after the nature and malice of the father. For as he devoureth his children, so one of them seeketh to devour and suppress the other; while antiquity envieth there should be new additions, and novelty cannot be content to add but it must deface; surely the advice of the prophet is the true direction in this matter, *State super vias antiquas, et videte quaenam sit via recta et bona et ambulate in ea*. Antiquity deserveth that reverence, that men should make a stand thereupon and discover what is the best way; but when the discovery is well taken,

then to make progression. And to speak truly, *Antiquitas saeculi juvenus mundi*. These times are the ancient times, when the world is ancient, and not those which we account ancient *ordine retrogrado*, by a computation backward from ourselves.

(2) Another error induced by the former is a distrust that anything should be now to be found out, which the world should have missed and passed over so long time: as if the same objection were to be made to time that Lucian maketh to Jupiter and other the heathen gods; of which he wondereth that they begot so many children in old time, and begot none in his time; and asketh whether they were become septuagenary, or whether the law *Papia*, made against old men's marriages, had restrained them. So it seemeth men doubt lest time is become past children and generation; wherein contrariwise we see commonly the levity and unconstancy of men's judgments, which, till a matter be done, wonder that it can be done; and as soon as it is done, wonder again that it was no sooner done: as we see in the expedition of Alexander into Asia, which at first was prejudged as a vast and impossible enterprise; and yet afterwards it pleaseth Livy to make no more of it than this, *Nil aliud quam bene ausus vana contemnere*. And the same happened to Columbus in the western navigation. But in intellectual matters it is much more common, as may be seen in most of the propositions of Euclid; which till they be demonstrate, they seem strange to our assent; but being demonstrate, our mind accepteth of them by a kind of relation (as the lawyers speak), as if we had known them before.

(3) Another error, that hath also some affinity with the former, is a conceit that of former opinions or sects after variety and examination the best hath still prevailed and suppressed the rest; so as if a man should begin the labour of a new search, he were but like to light upon somewhat formerly rejected, and by rejection brought into oblivion; as if the multitude, or the wisest for the multitude's sake, were not ready to give passage rather to that which is popular and superficial than to that which is substantial and profound for the truth is, that time seemeth to be of the nature of a river or stream, which carrieth down to us that which is light and blown up, and sinketh and drowneth that which is weighty and solid.

(4) Another error, of a diverse nature from all the former, is the over-early and peremptory reduction of knowledge into arts and methods; from which time commonly sciences receive small or no augmentation. But as young men, when they knit and shape perfectly, do seldom grow to a further stature, so knowledge, while it is in aphorisms and observations, it is in growth; but when it once is comprehended in exact methods, it may, perchance, be further polished, and illustrate and accommodated for use and practice, but it increaseth no more in bulk and substance.

(5) Another error which doth succeed that which we last mentioned is, that after the distribution of particular arts and sciences, men have abandoned universality, or *philosophia prima*, which cannot but cease and stop all progression. For no perfect discovery can be made upon a flat or a level; neither is it possible to discover the more remote and deeper parts of any science if you stand but upon the level of the same science, and ascend not to a higher science.

(6) Another error hath proceeded from too great a reverence, and a

kind of adoration of the mind and understanding of man; by means whereof, men have withdrawn themselves too much from the contemplation of nature, and the observations of experience, and have tumbled up and down in their own reason and conceits. Upon these intellectualists, which are notwithstanding commonly taken for the most sublime and divine philosophers, Heraclitus gave a just censure, saying: --"Men sought truth in their own little worlds, and not in the great and common world;" for they disdain to spell, and so by degrees to read in the volume of God's works; and contrariwise by continual meditation and agitation of wit do urge and, as it were, invoke their own spirits to divine and give oracles unto them, whereby they are deservedly deluded.

(7) Another error that hath some connection with this latter is, that men have used to infect their meditations, opinions, and doctrines with some conceits which they have most admired, or some sciences which they have most applied, and given all things else a tincture according to them, utterly untrue and improper. So hath Plato intermingled his philosophy with theology, and Aristotle with logic; and the second school of Plato, Proclus and the rest, with the mathematics; for these were the arts which had a kind of primogeniture with them severally. So have the alchemists made a philosophy out of a few experiments of the furnace; and Gilbertus our countryman hath made a philosophy out of the observations of a loadstone. So Cicero, when reciting the several opinions of the nature of the soul, he found a musician that held the soul was but a harmony, saith pleasantly, *Hic ab arte sua non recessit*, &c. But of these conceits Aristotle speaketh seriously and wisely when he saith, *Qui respiciunt ad pauca de facili pronunciant*.

(8) Another error is an impatience of doubt, and haste to assertion without due and mature suspension of judgment. For the two ways of contemplation are not unlike the two ways of action commonly spoken of by the ancients: the one plain and smooth in the beginning, and in the end impassable; the other rough and troublesome in the entrance, but after a while fair and even. So it is in contemplation: if a man will begin with certainties, he shall end in doubts; but if he will be content to begin with doubts, he shall end in certainties.

(9) Another error is in the manner of the tradition and delivery of knowledge, which is for the most part magistral and peremptory, and not ingenuous and faithful; in a sort as may be soonest believed, and not easiest examined. It is true, that in compendious treatises for practice that form is not to be disallowed; but in the true handling of knowledge men ought not to fall either on the one side into the vein of Velleius the Epicurean, *Nil tam metuens quam ne dubitare aliqua de re videretur*: nor, on the other side, into Socrates, his ironical doubting of all things; but to propound things sincerely with more or less asseveration, as they stand in a man's own judgment proved more or less.

(10) Other errors there are in the scope that men propound to themselves, whereunto they bend their endeavours; for, whereas the more constant and devote kind of professors of any science ought to propound to themselves to make some additions to their science, they convert their labours to aspire to certain second prizes: as to be a profound interpreter or commentor, to be a sharp champion or defender, to be a methodical compounder or abridger, and so the

patrimony of knowledge cometh to be sometimes improved, but seldom augmented.

(11) But the greatest error of all the rest is the mistaking or misplacing of the last or furthest end of knowledge. For men have entered into a desire of learning and knowledge, sometimes upon a natural curiosity and inquisitive appetite; sometimes to entertain their minds with variety and delight; sometimes for ornament and reputation; and sometimes to enable them to victory of wit and contradiction; and most times for lucre and profession; and seldom sincerely to give a true account of their gift of reason to the benefit and use of men: as if there were sought in knowledge a couch whereupon to rest a searching and restless spirit; or a terrace for a wandering and variable mind to walk up and down with a fair prospect; or a tower of state, for a proud mind to raise itself upon; or a fort or commanding ground, for strife and contention; or a shop, for profit or sale; and not a rich storehouse for the glory of the Creator and the relief of man's estate. But this is that which will indeed dignify and exalt knowledge, if contemplation and action may be more nearly and straitly conjoined and united together than they have been: a conjunction like unto that of the two highest planets, Saturn, the planet of rest and contemplation; and Jupiter, the planet of civil society and action, howbeit, I do not mean, when I speak of use and action, that end before-mentioned of the applying of knowledge to lucre and profession; for I am not ignorant how much that diverteth and interrupteth the prosecution and advancement of knowledge, like unto the golden ball thrown before Atalanta, which, while she goeth aside and stoopeth to take up, the race is hindered,

"Declinat cursus, aurumque volubile tollit." {1}

Neither is my meaning, as was spoken of Socrates, to call philosophy down from heaven to converse upon the earth--that is, to leave natural philosophy aside, and to apply knowledge only to manners and policy. But as both heaven and earth do conspire and contribute to the use and benefit of man, so the end ought to be, from both philosophies to separate and reject vain speculations, and whatsoever is empty and void, and to preserve and augment whatsoever is solid and fruitful; that knowledge may not be as a courtesan, for pleasure and vanity only, or as a bond-woman, to acquire and gain to her master's use; but as a spouse, for generation, fruit, and comfort.

(12) Thus have I described and opened, as by a kind of dissection, those peccant humours (the principal of them) which have not only given impediment to the proficiencie of learning, but have given also occasion to the traducement thereof: wherein, if I have been too plain, it must be remembered, *fidelia vulnera amantis, sed dolosa oscula malignantis*. This I think I have gained, that I ought to be the better believed in that which I shall say pertaining to commendation; because I have proceeded so freely in that which concerneth censure. And yet I have no purpose to enter into a laudative of learning, or to make a hymn to the Muses (though I am of opinion that it is long since their rites were duly celebrated), but my intent is, without varnish or amplification justly to weigh the dignity of knowledge in the balance with other things, and to

take the true value thereof by testimonies and arguments, divine and human.

VI. (1) First, therefore, let us seek the dignity of knowledge in the archetype or first platform, which is in the attributes and acts of God, as far as they are revealed to man and may be observed with sobriety; wherein we may not seek it by the name of learning, for all learning is knowledge acquired, and all knowledge in God is original, and therefore we must look for it by another name, that of wisdom or sapience, as the Scriptures call it.

(2) It is so, then, that in the work of the creation we see a double emanation of virtue from God; the one referring more properly to power, the other to wisdom; the one expressed in making the subsistence of the matter, and the other in disposing the beauty of the form. This being supposed, it is to be observed that for anything which appeareth in the history of the creation, the confused mass and matter of heaven and earth was made in a moment, and the order and disposition of that chaos or mass was the work of six days; such a note of difference it pleased God to put upon the works of power, and the works of wisdom; wherewith concurreth, that in the former it is not set down that God said, "Let there be heaven and earth," as it is set down of the works following; but actually, that God made heaven and earth: the one carrying the style of a manufacture, and the other of a law, decree, or counsel.

(3) To proceed, to that which is next in order from God, to spirits: we find, as far as credit is to be given to the celestial hierarchy of that supposed Dionysius, the senator of Athens, the first place or degree is given to the angels of love, which are termed seraphim; the second to the angels of light, which are termed cherubim; and the third, and so following places, to thrones, principalities, and the rest, which are all angels of power and ministry; so as this angels of knowledge and illumination are placed before the angels of office and domination.

(4) To descend from spirits and intellectual forms to sensible and material forms, we read the first form that was created was light, which hath a relation and correspondence in nature and corporal things to knowledge in spirits and incorporeal things.

(5) So in the distribution of days we see the day wherein God did rest and contemplate His own works was blessed above all the days wherein He did effect and accomplish them.

(6) After the creation was finished, it is set down unto us that man was placed in the garden to work therein; which work, so appointed to him, could be no other than work of contemplation; that is, when the end of work is but for exercise and experiment, not for necessity; for there being then no reluctance of the creature, nor sweat of the brow, man's employment must of consequence have been matter of delight in the experiment, and not matter of labour for the use. Again, the first acts which man performed in Paradise consisted of the two summary parts of knowledge; the view of creatures, and the imposition of names. As for the knowledge which induced the fall, it was, as was touched before, not the natural knowledge of creatures, but the moral knowledge of good and evil; wherein the supposition was, that God's commandments or prohibitions were not the originals of good and evil, but that they had other

beginnings, which man aspired to know, to the end to make a total defection from God and to depend wholly upon himself.

(7) To pass on: in the first event or occurrence after the fall of man, we see (as the Scriptures have infinite mysteries, not violating at all the truth of this story or letter) an image of the two estates, the contemplative state and the active state, figured in the two persons of Abel and Cain, and in the two simplest and most primitive trades of life; that of the shepherd (who, by reason of his leisure, rest in a place, and lying in view of heaven, is a lively image of a contemplative life), and that of the husbandman, where we see again the favour and election of God went to the shepherd, and not to the tiller of the ground.

(8) So in the age before the flood, the holy records within those few memorials which are there entered and registered have vouchsafed to mention and honour the name of the inventors and authors of music and works in metal. In the age after the flood, the first great judgment of God upon the ambition of man was the confusion of tongues; whereby the open trade and intercourse of learning and knowledge was chiefly imbarred.

(9) To descend to Moses the lawgiver, and God's first pen: he is adorned by the Scriptures with this addition and commendation, "That he was seen in all the learning of the Egyptians," which nation we know was one of the most ancient schools of the world: for so Plato brings in the Egyptian priest saying unto Solon, "You Grecians are ever children; you have no knowledge of antiquity, nor antiquity of knowledge." Take a view of the ceremonial law of Moses; you shall find, besides the prefiguration of Christ, the badge or difference of the people of God, the exercise and impression of obedience, and other divine uses and fruits thereof, that some of the most learned Rabbins have travailed profitably and profoundly to observe, some of them a natural, some of them a moral sense, or reduction of many of the ceremonies and ordinances. As in the law of the leprosy, where it is said, "If the whiteness have overspread the flesh, the patient may pass abroad for clean; but if there be any whole flesh remaining, he is to be shut up for unclean;" one of them noteth a principle of nature, that putrefaction is more contagious before maturity than after; and another noteth a position of moral philosophy, that men abandoned to vice do not so much corrupt manners, as those that are half good and half evil. So in this and very many other places in that law, there is to be found, besides the theological sense, much aspersion of philosophy.

(10) So likewise in that excellent hook of Job, if it be revolved with diligence, it will be found pregnant and swelling with natural philosophy; as for example, cosmography, and the roundness of the world, *Qui extendit aquilonem super vacuum, et appendit terram super nihilum*; wherein the pensileness of the earth, the pole of the north, and the finiteness or convexity of heaven are manifestly touched. So again, matter of astronomy: *Spiritus ejus ornavit caelos, et obstetricante manu ejus eductus est Coluber tortuosus*. And in another place, *Nunquid conjungere valebis micantes stellas Pleiadas, aut gyrum Arcturi poteris dissipare?* Where the fixing of the stars, ever standing at equal distance, is with great elegancy noted. And in another place, *Qui facit Arcturum, et Oriona, et Hyadas, et interiora Austri*; where again he takes knowledge of the depression of the southern pole, calling it the secrets of the

south, because the southern stars were in that climate unseen. Matter of generation: *Annon sicut lac mulsisti me, et sicut caseum coagulasti me? &c.* Matter of minerals: *Habet argentum venarum suarum principia; et auro locus est in quo conflatur, ferrum de terra tollitur, et lapis solutus calore in aes vertitur;* and so forwards in that chapter.

(11) So likewise in the person of Solomon the king, we see the gift or endowment of wisdom and learning, both in Solomon's petition and in God's assent thereunto, preferred before all other terrene and temporal felicity. By virtue of which grant or donative of God Solomon became enabled not only to write those excellent parables or aphorisms concerning divine and moral philosophy, but also to compile a natural history of all verdure, from the cedar upon the mountain to the moss upon the wall (which is but a rudiment between putrefaction and an herb), and also of all things that breathe or move. Nay, the same Solomon the king, although he excelled in the glory of treasure and magnificent buildings, of shipping and navigation, of service and attendance, of fame and renown, and the like, yet he maketh no claim to any of those glories, but only to the glory of inquisition of truth; for so he saith expressly, "The glory of God is to conceal a thing, but the glory of the king is to find it out;" as if, according to the innocent play of children, the Divine Majesty took delight to hide His works, to the end to have them found out; and as if kings could not obtain a greater honour than to be God's playfellows in that game; considering the great commandment of wits and means, whereby nothing needeth to be hidden from them.

(12) Neither did the dispensation of God vary in the times after our Saviour came into the world; for our Saviour himself did first show His power to subdue ignorance, by His conference with the priests and doctors of the law, before He showed His power to subdue nature by His miracles. And the coming of this Holy Spirit was chiefly figured and expressed in the similitude and gift of tongues, which are but *vehicula scientiae*.

(13) So in the election of those instruments, which it pleased God to use for the plantation of the faith, notwithstanding that at the first He did employ persons altogether unlearned, otherwise than by inspiration, more evidently to declare His immediate working, and to abase all human wisdom or knowledge; yet nevertheless that counsel of His was no sooner performed, but in the next vicissitude and succession He did send His divine truth into the world, waited on with other learnings, as with servants or handmaids: for so we see St. Paul, who was only learned amongst the Apostles, had his pen most used in the Scriptures of the New Testament.

(14) So again we find that many of the ancient bishops and fathers of the Church were excellently read and studied in all the learning of this heathen; insomuch that the edict of the Emperor Julianus (whereby it was interdicted unto Christians to be admitted into schools, lectures, or exercises of learning) was esteemed and accounted a more pernicious engine and machination against the Christian Faith than were all the sanguinary prosecutions of his predecessors; neither could the emulation and jealousy of Gregory, the first of that name, Bishop of Rome, ever obtain the opinion of piety or devotion; but contrariwise received the censure of humour, malignity, and pusillanimity, even amongst holy men; in that he

designed to obliterate and extinguish the memory of heathen antiquity and authors. But contrariwise it was the Christian Church, which, amidst the inundations of the Scythians on the one side from the north-west, and the Saracens from the east, did preserve in the sacred lap and bosom thereof the precious relics even of heathen learning, which otherwise had been extinguished, as if no such thing had ever been.

(15) And we see before our eyes, that in the age of ourselves and our fathers, when it pleased God to call the Church of Rome to account for their degenerate manners and ceremonies, and sundry doctrines obnoxious and framed to uphold the same abuses; at one and the same time it was ordained by the Divine Providence that there should attend withal a renovation and new spring of all other knowledges. And on the other side we see the Jesuits, who partly in themselves, and partly by the emulation and provocation of their example, have much quickened and strengthened the state of learning; we see (I say) what notable service and reparation they have done to the Roman see.

(16) Wherefore, to conclude this part, let it be observed, that there be two principal duties and services, besides ornament and illustration, which philosophy and human learning do perform to faith and religion. The one, because they are an effectual inducement to the exaltation of the glory of God. For as the Psalms and other Scriptures do often invite us to consider and magnify the great and wonderful works of God, so if we should rest only in the contemplation of the exterior of them as they first offer themselves to our senses, we should do a like injury unto the majesty of God, as if we should judge or construe of the store of some excellent jeweller by that only which is set out toward the street in his shop. The other, because they minister a singular help and preservative against unbelief and error. For our Saviour saith, "You err, not knowing the Scriptures, nor the power of God;" laying before us two books or volumes to study, if we will be secured from error: first the Scriptures, revealing the will of God, and then the creatures expressing His power; whereof the latter is a key unto the former: not only opening our understanding to conceive the true sense of the Scriptures by the general notions of reason and rules of speech, but chiefly opening our belief, in drawing us into a due meditation of the omnipotency of God, which is chiefly signed and engraven upon His works. Thus much therefore for divine testimony and evidence concerning the true dignity and value of learning.

VII. (1) As for human proofs, it is so large a field, as in a discourse of this nature and brevity it is fit rather to use choice of those things which we shall produce, than to embrace the variety of them. First, therefore, in the degrees of human honour amongst the heathen, it was the highest to obtain to a veneration and adoration as a God. This unto the Christians is as the forbidden fruit. But we speak now separately of human testimony, according to which--that which the Grecians call apotheosis, and the Latins *relatio inter divos*--was the supreme honour which man could attribute unto man, specially when it was given, not by a formal decree or act of state (as it was used among the Roman Emperors), but by an inward assent and belief. Which honour, being so high, had also a degree or middle term; for there were reckoned above human honours, honours heroical and divine: in the attribution and distribution of which honours we see antiquity made this difference;

that whereas founders and uniters of states and cities, lawgivers, extirpers of tyrants, fathers of the people, and other eminent persons in civil merit, were honoured but with the titles of worthies or demigods, such as were Hercules, Theseus, Minus, Romulus, and the like; on the other side, such as were inventors and authors of new arts, endowments, and commodities towards man's life, were ever consecrated amongst the gods themselves, as was Ceres, Bacchus, Mercurius, Apollo, and others. And justly; for the merit of the former is confined within the circle of an age or a nation, and is like fruitful showers, which though they be profitable and good, yet serve but for that season, and for a latitude of ground where they fall; but the other is, indeed, like the benefits of heaven, which are permanent and universal. The former again is mixed with strife and perturbation, but the latter hath the true character of Divine Presence, coming in aura leni, without noise or agitation.

(2) Neither is certainly that other merit of learning, in repressing the inconveniences which grow from man to man, much inferior to the former, of relieving the necessities which arise from nature, which merit was lively set forth by the ancients in that feigned relation of Orpheus' theatre, where all beasts and birds assembled, and, forgetting their several appetites--some of prey, some of game, some of quarrel--stood all sociably together listening unto the airs and accords of the harp, the sound whereof no sooner ceased, or was drowned by some louder noise, but every beast returned to his own nature; wherein is aptly described the nature and condition of men, who are full of savage and unreclaimed desires, of profit, of lust, of revenge; which as long as they give ear to precepts, to laws, to religion, sweetly touched with eloquence and persuasion of books, of sermons, of harangues, so long is society and peace maintained; but if these instruments be silent, or that sedition and tumult make them not audible, all things dissolve into anarchy and confusion.

(3) But this appeareth more manifestly when kings themselves, or persons of authority under them, or other governors in commonwealths and popular estates, are endued with learning. For although he might be thought partial to his own profession that said "Then should people and estates be happy when either kings were philosophers, or philosophers kings;" yet so much is verified by experience, that under learned princes and governors there have been ever the best times: for howsoever kings may have their imperfections in their passions and customs, yet, if they be illuminate by learning, they have those notions of religion, policy, and morality, which do preserve them and refrain them from all ruinous and peremptory errors and excesses, whispering evermore in their ears, when counsellors and servants stand mute and silent. And senators or counsellors, likewise, which be learned, to proceed upon more safe and substantial principles, than counsellors which are only men of experience; the one sort keeping dangers afar off, whereas the other discover them not till they come near hand, and then trust to the agility of their wit to ward or avoid them.

(4) Which felicity of times under learned princes (to keep still the law of brevity, by using the most eminent and selected examples) doth best appear in the age which passed from the death of Domitianus the emperor until the reign of Commodus; comprehending a succession of six princes, all learned, or singular favourers and advancers of learning, which age for temporal respects was the most

happy and flourishing that ever the Roman Empire (which then was a model of the world) enjoyed--a matter revealed and prefigured unto Domitian in a dream the night before he was slain: for he thought there was grown behind upon his shoulders a neck and a head of gold, which came accordingly to pass in those golden times which succeeded; of which princes we will make some commemoration; wherein, although the matter will be vulgar, and may be thought fitter for a declamation than agreeable to a treatise infolded as this is, yet, because it is pertinent to the point in hand--Neque semper arcum tendit Apollo--and to name them only were too naked and cursory, I will not omit it altogether. The first was Nerva, the excellent temper of whose government is by a glance in Cornelius Tacitus touched to the life: Postquam divus Nerva res oluim insociabiles miscuisset, imperium et libertatem. And in token of his learning, the last act of his short reign left to memory was a missive to his adopted son, Trajan, proceeding upon some inward discontent at the ingratitude of the times, comprehended in a verse of Homer's -

"Telis, Phoebe, tuis, lacrymas ulciscere nostras."

(5) Trajan, who succeeded, was for his person not learned; but if we will hearken to the speech of our Saviour, that saith, "He that receiveth a prophet in the name of a prophet shall have a prophet's reward," he deserveth to be placed amongst the most learned princes; for there was not a greater admirer of learning or benefactor of learning, a founder of famous libraries, a perpetual advancer of learned men to office, and familiar converser with learned professors and preceptors who were noted to have then most credit in court. On the other side how much Trajan's virtue and government was admired and renowned, surely no testimony of grave and faithful history doth more lively set forth than that legend tale of Gregorius Magnum, Bishop of Rome, who was noted for the extreme envy he bare towards all heathen excellency; and yet he is reported, out of the love and estimation of Trajan's moral virtues, to have made unto God passionate and fervent prayers for the delivery of his soul out of hell, and to have obtained it, with a caveat that he should make no more such petitions. In this prince's time also the persecutions against the Christians received intermission upon the certificate of Plinius Secundus, a man of excellent learning and by Trajan advanced.

(6) Adrian, his successor, was the most curious man that lived, and the most universal inquirer: insomuch as it was noted for an error in his mind that he desired to comprehend all things, and not to reserve himself for the worthiest things, falling into the like humour that was long before noted in Philip of Macedon, who, when he would needs overrule and put down an excellent musician in an argument touching music, was well answered by him again--"God forbid, sir," saith he, "that your fortune should be so bad as to know these things better than I." It pleased God likewise to use the curiosity of this emperor as an inducement to the peace of His Church in those days; for having Christ in veneration, not as a God or Saviour, but as a wonder or novelty, and having his picture in his gallery matched with Apollonius (with whom in his vain imagination he thought it had some conformity), yet it served the turn to allay the bitter hatred of those times against the Christian

name, so as the Church had peace during his time. And for his government civil, although he did not attain to that of Trajan's in glory of arms or perfection of justice, yet in deserving of the weal of the subject he did exceed him. For Trajan erected many famous monuments and buildings, insomuch as Constantine the Great in emulation was wont to call him *Parietaria*, "wall-flower," because his name was upon so many walls; but his buildings and works were more of glory and triumph than use and necessity. But Adrian spent his whole reign, which was peaceable, in a perambulation or survey of the Roman Empire, giving order and making assignation where he went for re-edifying of cities, towns, and forts decayed, and for cutting of rivers and streams, and for making bridges and passages, and for policing of cities and commonalties with new ordinances and constitutions, and granting new franchises and incorporations; so that his whole time was a very restoration of all the lapses and decays of former times.

(7) Antoninus Pius, who succeeded him, was a prince excellently learned, and had the patient and subtle wit of a schoolman, insomuch as in common speech (which leaves no virtue untaxed) he was called *Cymini Sector*, a carver or a divider of cummin seed, which is one of the least seeds. Such a patience he had and settled spirit to enter into the least and most exact differences of causes, a fruit no doubt of the exceeding tranquillity and serenity of his mind, which being no ways charged or encumbered, either with fears, remorse, or scruples, but having been noted for a man of the purest goodness, without all fiction or affectation, that hath reigned or lived, made his mind continually present and entire. He likewise approached a degree nearer unto Christianity, and became, as Agrippa said unto St. Paul, "half a Christian," holding their religion and law in good opinion, and not only ceasing persecution, but giving way to the advancement of Christians.

(5) There succeeded him the first *Divi fratres*, the two adoptive brethren--Lucius Commodus Verus, son to Aelius Verus, who delighted much in the softer kind of learning, and was wont to call the poet Martial his Virgil; and Marcus Aurelius Antoninus: whereof the latter, who obscured his colleague and survived him long, was named the "Philosopher," who, as he excelled all the rest in learning, so he excelled them likewise in perfection of all royal virtues; insomuch as Julianus the emperor, in his book entitled *Caesares*, being as a pasquil or satire to deride all his predecessors, feigned that they were all invited to a banquet of the gods, and Silenus the jester sat at the nether end of the table and bestowed a scoff on everyone as they came in; but when Marcus Philosophus came in, Silenus was gravelled and out of countenance, not knowing where to carp at him, save at the last he gave a glance at his patience towards his wife. And the virtue of this prince, continued with that of his predecessor, made the name of Antoninus so sacred in the world, that though it were extremely dishonoured in Commodus, Caracalla, and Heliogabalus, who all bare the name, yet, when Alexander Severus refused the name because he was a stranger to the family, the Senate with one acclamation said, *Quomodo Augustus, sic et Antoninus*. In such renown and veneration was the name of these two princes in those days, that they would have had it as a perpetual addition in all the emperors' style. In this emperor's time also the Church for the most part was in peace; so as in this sequence of six princes we do see the blessed effects of learning in sovereignty, painted forth in the greatest table of the world.

(9) But for a tablet or picture of smaller volume (not presuming to speak of your Majesty that liveth), in my judgment the most excellent is that of Queen Elizabeth, your immediate predecessor in this part of Britain; a prince that, if Plutarch were now alive to write lives by parallels, would trouble him, I think, to find for her a parallel amongst women. This lady was endued with learning in her sex singular, and rare even amongst masculine princes--whether we speak of learning, of language, or of science, modern or ancient, divinity or humanity--and unto the very last year of her life she accustomed to appoint set hours for reading, scarcely any young student in a university more daily or more dully. As for her government, I assure myself (I shall not exceed if I do affirm) that this part of the island never had forty-five years of better times, and yet not through the calmness of the season, but through the wisdom of her regiment. For if there be considered, of the one side, the truth of religion established, the constant peace and security, the good administration of justice, the temperate use of the prerogative, not slackened, nor much strained; the flourishing state of learning, sortable to so excellent a patroness; the convenient estate of wealth and means, both of crown and subject; the habit of obedience, and the moderation of discontents; and there be considered, on the other side, the differences of religion, the troubles of neighbour countries, the ambition of Spain, and opposition of Rome, and then that she was solitary and of herself; these things, I say, considered, as I could not have chosen an instance so recent and so proper, so I suppose I could not have chosen one more remarkable or eminent to the purpose now in hand, which is concerning the conjunction of learning in the prince with felicity in the people.

(10) Neither hath learning an influence and operation only upon civil merit and moral virtue, and the arts or temperature of peace and peaceable government; but likewise it hath no less power and efficacy in enablement towards martial and military virtue and prowess, as may be notably represented in the examples of Alexander the Great and Caesar the Dictator (mentioned before, but now in fit place to be resumed), of whose virtues and acts in war there needs no note or recital, having been the wonders of time in that kind; but of their affections towards learning and perfections in learning it is pertinent to say somewhat.

(11) Alexander was bred and taught under Aristotle, the great philosopher, who dedicated divers of his books of philosophy unto him; he was attended with Callisthenes and divers other learned persons, that followed him in camp, throughout his journeys and conquests. What price and estimation he had learning in doth notably appear in these three particulars: first, in the envy he used to express that he bare towards Achilles, in this, that he had so good a trumpet of his praises as Homer's verses; secondly, in the judgment or solution he gave touching that precious cabinet of Darius, which was found among his jewels (whereof question was made what thing was worthy to be put into it, and he gave his opinion for Homer's works); thirdly, in his letter to Aristotle, after he had set forth his books of nature, wherein he expostulateth with him for publishing the secrets or mysteries of philosophy; and gave him to understand that himself esteemed it more to excel other men in learning and knowledge than in power and empire. And what use he had of learning doth appear, or rather shine, in all his speeches

and answers, being full of science and use of science, and that in all variety.

(12) And herein again it may seem a thing scholastical, and somewhat idle to recite things that every man knoweth; but yet, since the argument I handle leadeth me thereunto, I am glad that men shall perceive I am as willing to flatter (if they will so call it) an Alexander, or a Caesar, or an Antoninus, that are dead many hundred years since, as any that now liveth; for it is the displaying of the glory of learning in sovereignty that I propound to myself, and not a humour of declaiming in any man's praises. Observe, then, the speech he used of Diogenes, and see if it tend not to the true state of one of the greatest questions of moral philosophy: whether the enjoying of outward things, or the contemning of them, be the greatest happiness; for when he saw Diogenes so perfectly contented with so little, he said to those that mocked at his condition, "were I not Alexander, I would wish to be Diogenes." But Seneca inverteth it, and saith, "Plus erat, quod hic nollet accipere, quam quod ille posset dare." There were more things which Diogenes would have refused than those were which Alexander could have given or enjoyed.

(13) Observe, again, that speech which was usual with him,--"That he felt his mortality chiefly in two things, sleep and lust;" and see if it were not a speech extracted out of the depth of natural philosophy, and liker to have come out of the mouth of Aristotle or Democritus than from Alexander.

(14) See, again, that speech of humanity and poesy, when, upon the bleeding of his wounds, he called unto him one of his flatterers, that was wont to ascribe to him divine honour, and said, "Look, this is very blood; this is not such a liquor as Homer speaketh of, which ran from Venus' hand when it was pierced by Diomedes."

(15) See likewise his readiness in reprehension of logic in the speech he used to Cassander, upon a complaint that was made against his father Antipater; for when Alexander happened to say, "Do you think these men would have come from so far to complain except they had just cause of grief?" and Cassander answered, "Yea, that was the matter, because they thought they should not be disproved;" said Alexander, laughing, "See the subtleties of Aristotle, to take a matter both ways, pro et contra, &c."

(16) But note, again, how well he could use the same art which he reprehended to serve his own humour: when bearing a secret grudge to Callisthenes, because he was against the new ceremony of his adoration, feasting one night where the same Callisthenes was at the table, it was moved by some after supper, for entertainment sake, that Callisthenes, who was an eloquent man, might speak of some theme or purpose at his own choice; which Callisthenes did, choosing the praise of the Macedonian nation for his discourse, and performing the same with so good manner as the hearers were much ravished; whereupon Alexander, nothing pleased, said, "It was easy to be eloquent upon so good a subject; but," saith he, "turn your style, and let us hear what you can say against us;" which Callisthenes presently undertook, and did with that sting and life that Alexander interrupted him, and said, "The goodness of the cause made him eloquent before, and despite made him eloquent then again."

(17) Consider further, for tropes of rhetoric, that excellent use of

a metaphor or translation, wherewith he taxeth Antipater, who was an imperious and tyrannous governor; for when one of Antipater's friends commended him to Alexander for his moderation, that he did not degenerate as his other lieutenants did into the Persian pride, in uses of purple, but kept the ancient habit of Macedon, of black. "True," saith Alexander; "but Antipater is all purple within." Or that other, when Parmenio came to him in the plain of Arbela and showed him the innumerable multitude of his enemies, specially as they appeared by the infinite number of lights as it had been a new firmament of stars, and thereupon advised him to assail them by night; whereupon he answered, "That he would not steal the victory."

(18) For matter of policy, weigh that significant distinction, so much in all ages embraced, that he made between his two friends Hephaestion and Craterus, when he said, "That the one loved Alexander, and the other loved the king:" describing the principal difference of princes' best servants, that some in affection love their person, and other in duty love their crown.

(19) Weigh also that excellent taxation of an error, ordinary with counsellors of princes, that they counsel their masters according to the model of their own mind and fortune, and not of their masters. When upon Darius' great offers Parmenio had said, "Surely I would accept these offers were I as Alexander;" saith Alexander, "So would I were I as Parmenio."

(20) Lastly, weigh that quick and acute reply which he made when he gave so large gifts to his friends and servants, and was asked what he did reserve for himself, and he answered, "Hope." Weigh, I say, whether he had not cast up his account aright, because hope must be the portion of all that resolve upon great enterprises; for this was Caesar's portion when he went first into Gaul, his estate being then utterly overthrown with largesses. And this was likewise the portion of that noble prince, howsoever transported with ambition, Henry Duke of Guise, of whom it was usually said that he was the greatest usurer in France, because he had turned all his estate into obligations.

(21) To conclude, therefore, as certain critics are used to say hyperbolically, "That if all sciences were lost they might be found in Virgil," so certainly this may be said truly, there are the prints and footsteps of learning in those few speeches which are reported of this prince, the admiration of whom, when I consider him not as Alexander the Great, but as Aristotle's scholar, hath carried me too far.

(22) As for Julius Caesar, the excellency of his learning needeth not to be argued from his education, or his company, or his speeches; but in a further degree doth declare itself in his writings and works: whereof some are extant and permanent, and some unfortunately perished. For first, we see there is left unto us that excellent history of his own wars, which he entitled only a Commentary, wherein all succeeding times have admired the solid weight of matter, and the real passages and lively images of actions and persons, expressed in the greatest propriety of words and perspicuity of narration that ever was; which that it was not the effect of a natural gift, but of learning and precept, is well witnessed by that work of his entitled De Analogia, being a grammatical philosophy, wherein he did labour to make this same Vox

ad placitum to become Vox ad licitum, and to reduce custom of speech to congruity of speech; and took as it were the pictures of words from the life of reason.

(23) So we receive from him, as a monument both of his power and learning, the then reformed computation of the year; well expressing that he took it to be as great a glory to himself to observe and know the law of the heavens, as to give law to men upon the earth.

(24) So likewise in that book of his, Anti-Cato, it may easily appear that he did aspire as well to victory of wit as victory of war: undertaking therein a conflict against the greatest champion with the pen that then lived, Cicero the orator.

(25) So, again, in his book of Apophthegms, which he collected, we see that he esteemed it more honour to make himself but a pair of tables, to take the wise and pithy words of others, than to have every word of his own to be made an apophthegm or an oracle, as vain princes, by custom of flattery, pretend to do. And yet if I should enumerate divers of his speeches, as I did those of Alexander, they are truly such as Solomon noteth, when he saith, Verba sapientum tanquam aculei, et tanquam clavi in altum defixi: whereof I will only recite three, not so delectable for elegancy, but admirable for vigour and efficacy.

(26) As first, it is reason he be thought a master of words, that could with one word appease a mutiny in his army, which was thus: The Romans, when their generals did speak to their army, did use the word Milites, but when the magistrates spake to the people they did use the word Quirites. The soldiers were in tumult, and seditiously prayed to be cashiered; not that they so meant, but by expostulation thereof to draw Caesar to other conditions; wherein he being resolute not to give way, after some silence, he began his speech, Ego Quirites, which did admit them already cashiered--wherewith they were so surprised, crossed, and confused, as they would not suffer him to go on in his speech, but relinquished their demands, and made it their suit to be again called by the name of Milites.

(27) The second speech was thus: Caesar did extremely affect the name of king; and some were set on as he passed by in popular acclamation to salute him king. Whereupon, finding the cry weak and poor, he put it off thus, in a kind of jest, as if they had mistaken his surname: Non Rex sum, sed Caesar; a speech that, if it be searched, the life and fulness of it can scarce be expressed. For, first, it was a refusal of the name, but yet not serious; again, it did signify an infinite confidence and magnanimity, as if he presumed Caesar was the greater title, as by his worthiness it is come to pass till this day. But chiefly it was a speech of great allurements toward his own purpose, as if the state did strive with him but for a name, whereof mean families were vested; for Rex was a surname with the Romans, as well as King is with us.

(28) The last speech which I will mention was used to Metellus, when Caesar, after war declared, did possess himself of this city of Rome; at which time, entering into the inner treasury to take the money there accumulate, Metellus, being tribune, forbade him. Whereto Caesar said, "That if he did not desist, he would lay him dead in the place." And presently taking himself up, he added, "Young man, it is harder for me to speak it than to do it--"

Adolescens, durius est mihi hoc dicere quam facere." A speech compounded of the greatest terror and greatest clemency that could proceed out of the mouth of man.

(29) But to return and conclude with him, it is evident himself knew well his own perfection in learning, and took it upon him, as appeared when upon occasion that some spake what a strange resolution it was in Lucius Sylla to resign his dictators, he, scoffing at him to his own advantage, answered, "That Sylla could not skill of letters, and therefore knew not how to dictate."

(30) And here it were fit to leave this point, touching the concurrence of military virtue and learning (for what example should come with any grace after those two of Alexander and Caesar?), were it not in regard of the rareness of circumstance, that I find in one other particular, as that which did so suddenly pass from extreme scorn to extreme wonder: and it is of Xenophon the philosopher, who went from Socrates' school into Asia in the expedition of Cyrus the younger against King Artaxerxes. This Xenophon at that time was very young, and never had seen the wars before, neither had any command in the army, but only followed the war as a voluntary, for the love and conversation of Proxenus, his friend. He was present when Falinus came in message from the great king to the Grecians, after that Cyrus was slain in the field, and they, a handful of men, left to themselves in the midst of the king's territories, cut off from their country by many navigable rivers and many hundred miles. The message imported that they should deliver up their arms and submit themselves to the king's mercy. To which message, before answer was made, divers of the army conferred familiarly with Falinus; and amongst the rest Xenophon happened to say, "Why, Falinus, we have now but these two things left, our arms and our virtue; and if we yield up our arms, how shall we make use of our virtue?" Whereto Falinus, smiling on him, said, "If I be not deceived, young gentleman, you are an Athenian, and I believe you study philosophy, and it is pretty that you say; but you are much abused if you think your virtue can withstand the king's power." Here was the scorn; the wonder followed: which was that this young scholar or philosopher, after all the captains were murdered in parley by treason, conducted those ten thousand foot, through the heart of all the king's high countries, from Babylon to Graecia in safety, in despite of all the king's forces, to the astonishment of the world, and the encouragement of the Grecians in times succeeding to make invasion upon the kings of Persia, as was after purposed by Jason the Thessalian, attempted by Agesilaus the Spartan, and achieved by Alexander the Macedonian, all upon the ground of the act of that young scholar.

VIII. (1) To proceed now from imperial and military virtue to moral and private virtue; first, it is an assured truth, which is contained in the verses:-

"Scilicet ingenuas didicisse fideliter artes
Emollit mores nec sinit esse ferus."

It taketh away the wildness and barbarism and fierceness of men's minds; but indeed the accent had need be upon fideliter; for a little superficial learning doth rather work a contrary effect. It

taketh away all levity, temerity, and insolency, by copious suggestion of all doubts and difficulties, and acquainting the mind to balance reasons on both sides, and to turn back the first offers and conceits of the mind, and to accept of nothing but examined and tried. It taketh away vain admiration of anything, which is the root of all weakness. For all things are admired, either because they are new, or because they are great. For novelty, no man that wadeth in learning or contemplation thoroughly but will find that printed in his heart, Nil novi super terram. Neither can any man marvel at the play of puppets, that goeth behind the curtain, and adviseth well of the motion. And for magnitude, as Alexander the Great, after that he was used to great armies, and the great conquests of the spacious provinces in Asia, when he received letters out of Greece, of some fights and services there, which were commonly for a passage or a fort, or some walled town at the most, he said: --"It seemed to him that he was advertised of the battles of the frogs and the mice, that the old tales went of." So certainly, if a man meditate much upon the universal frame of nature, the earth with men upon it (the divineness of souls except) will not seem much other than an ant-hill, whereas some ants carry corn, and some carry their young, and some go empty, and all to and fro a little heap of dust. It taketh away or mitigateth fear of death or adverse fortune, which is one of the greatest impediments of virtue and imperfections of manners. For if a man's mind be deeply seasoned with the consideration of the mortality and corruptible nature of things, he will easily concur with Epictetus, who went forth one day and saw a woman weeping for her pitcher of earth that was broken, and went forth the next day and saw a woman weeping for her son that was dead, and thereupon said, "Heri vidi fragilem frangi, hodie vidi mortalem mori." And, therefore, Virgil did excellently and profoundly couple the knowledge of causes and the conquest of all fears together, as concomitantia.

"Felix, qui potuit rerum cognoscere causas,
Quique metus omnes, et inexorabile fatum
Subjecit pedibus, strepitumque Acherontis avari."

(2) It were too long to go over the particular remedies which learning doth minister to all the diseases of the mind: sometimes purging the ill humours, sometimes opening the obstructions, sometimes helping digestion, sometimes increasing appetite, sometimes healing the wounds and exulcerations thereof, and the like; and, therefore, I will conclude with that which hath rationem totius--which is, that it disposeth the constitution of the mind not to be fixed or settled in the defects thereof, but still to be capable and susceptible of growth and reformation. For the unlearned man knows not what it is to descend into himself, or to call himself to account, nor the pleasure of that suavissima vita, indies sentire se fieri meliorem. The good parts he hath he will learn to show to the full, and use them dexterously, but not much to increase them. The faults he hath he will learn how to hide and colour them, but not much to amend them; like an ill mower, that mows on still, and never whets his scythe. Whereas with the learned man it fares otherwise, that he doth ever intermix the correction and amendment of his mind with the use and employment thereof. Nay, further, in general and in sum, certain it is that Veritas and Bonitas differ but as the seal and the print; for truth prints

goodness, and they be the clouds of error which descend in the storms of passions and perturbations.

(3) From moral virtue let us pass on to matter of power and commandment, and consider whether in right reason there be any comparable with that wherewith knowledge investeth and crowneth man's nature. We see the dignity of the commandment is according to the dignity of the commanded; to have commandment over beasts as herdmen have, is a thing contemptible; to have commandment over children as schoolmasters have, is a matter of small honour; to have commandment over galley-slaves is a disparagement rather than an honour. Neither is the commandment of tyrants much better, over people which have put off the generosity of their minds; and, therefore, it was ever holden that honours in free monarchies and commonwealths had a sweetness more than in tyrannies, because the commandment extendeth more over the wills of men, and not only over their deeds and services. And therefore, when Virgil putteth himself forth to attribute to Augustus Caesar the best of human honours, he doth it in these words:-

"Victorque volentes
Per populos dat jura, viamque affectat Olympo."

But yet the commandment of knowledge is yet higher than the commandment over the will; for it is a commandment over the reason, belief, and understanding of man, which is the highest part of the mind, and giveth law to the will itself. For there is no power on earth which setteth up a throne or chair of estate in the spirits

and souls of men, and in their cogitations, imaginations, opinions, and beliefs, but knowledge and learning. And therefore we see the detestable and extreme pleasure that arch-heretics, and false prophets, and impostors are transported with, when they once find in themselves that they have a superiority in the faith and conscience of men; so great as if they have once tasted of it, it is seldom seen that any torture or persecution can make them relinquish or abandon it. But as this is that which the author of the Revelation calleth the depth or profoundness of Satan, so by argument of contraries, the just and lawful sovereignty over men's understanding, by force of truth rightly interpreted, is that which approacheth nearest to the similitude of the divine rule.

(4) As for fortune and advancement, the beneficence of learning is not so confined to give fortune only to states and commonwealths, as it doth not likewise give fortune to particular persons. For it was well noted long ago, that Homer hath given more men their livings, than either Sylla, or Caesar, or Augustus ever did, notwithstanding their great largesses and donatives, and distributions of lands to so many legions. And no doubt it is hard to say whether arms or learning have advanced greater numbers. And in case of sovereignty we see, that if arms or descent have carried away the kingdom, yet learning hath carried the priesthood, which ever hath been in some competition with empire.

(5) Again, for the pleasure and delight of knowledge and learning, it far surpasseth all other in nature. For, shall the pleasures of the affections so exceed the pleasure of the sense, as much as the

obtaining of desire or victory exceedeth a song or a dinner? and must not of consequence the pleasures of the intellect or understanding exceed the pleasures of the affections? We see in all other pleasures there is satiety, and after they be used, their verdure departeth, which showeth well they be but deceits of pleasure, and not pleasures; and that it was the novelty which pleased, and not the quality. And, therefore, we see that voluptuous men turn friars, and ambitious princes turn melancholy. But of knowledge there is no satiety, but satisfaction and appetite are perpetually interchangeable; and, therefore, appeareth to be good in itself simply, without fallacy or accident. Neither is that pleasure of small efficacy and contentment to the mind of man, which the poet Lucretius describeth elegantly:-

"Suave mari magno, turbantibus aequora ventis, &c."

"It is a view of delight," saith he, "to stand or walk upon the shore side, and to see a ship tossed with tempest upon the sea; or to be in a fortified tower, and to see two battles join upon a plain. But it is a pleasure incomparable, for the mind of man to be settled, landed, and fortified in the certainty of truth; and from thence to descry and behold the errors, perturbations, labours, and wanderings up and down of other men.

(6) Lastly, leaving the vulgar arguments, that by learning man excelleth man in that wherein man excelleth beasts; that by learning man ascendeth to the heavens and their motions, where in body he cannot come; and the like: let us conclude with the dignity and excellency of knowledge and learning in that whereunto man's nature doth most aspire, which is immortality, or continuance; for to this tendeth generation, and raising of houses and families; to this tend buildings, foundations, and monuments; to this tendeth the desire of memory, fame, and celebration; and in effect the strength of all other human desires. We see then how far the monuments of wit and learning are more durable than the monuments of power or of the hands. For have not the verses of Homer continued twenty-five hundred years, or more, without the loss of a syllable or letter; during which the infinite palaces, temples, castles, cities, have been decayed and demolished? It is not possible to have the true pictures or statues of Cyrus, Alexander, Caesar, no nor of the kings or great personages of much later years; for the originals cannot last, and the copies cannot but leese of the life and truth. But the images of men's wits and knowledges remain in books, exempted from the wrong of time and capable of perpetual renovation. Neither are they fitly to be called images, because they generate still, and cast their seeds in the minds of others, provoking and causing infinite actions and opinions in succeeding ages. So that if the invention of the ship was thought so noble, which carrieth riches and commodities from place to place, and consociateth the most remote regions in participation of their fruits, how much more are letters to be magnified, which as ships pass through the vast seas of time, and make ages so distant to participate of the wisdom, illuminations, and inventions, the one of the other? Nay, further, we see some of the philosophers which were least divine, and most immersed in the senses, and denied generally the immortality of the soul, yet came to this point, that whatsoever motions the spirit of man could act and perform without the organs of the body, they

thought might remain after death, which were only those of the understanding and not of the affection; so immortal and incorruptible a thing did knowledge seem unto them to be. But we, that know by divine revelation that not only the understanding but the affections purified, not only the spirit but the body changed, shall be advanced to immortality, do disclaim in these rudiments of the senses. But it must be remembered, both in this last point, and so it may likewise be needful in other places, that in probation of the dignity of knowledge or learning, I did in the beginning separate divine testimony from human, which method I have pursued, and so handled them both apart.

(7) Nevertheless I do not pretend, and I know it will be impossible for me, by any pleading of mine, to reverse the judgment, either of AEsop's cock, that preferred the barleycorn before the gem; or of Midas, that being chosen judge between Apollo, president of the Muses, and Pan, god of the flocks, judged for plenty; or of Paris, that judged for beauty and love against wisdom and power; or of Agrippina, occidat matrem, modo imperet, that preferred empire with any condition never so detestable; or of Ulysses, qui vetulam praetulit immortalitati, being a figure of those which prefer custom and habit before all excellency, or of a number of the like popular judgments. For these things must continue as they have been; but so will that also continue whereupon learning hath ever relied, and which faileth not: *Justificata est sapientia a filiis suis.*

THE SECOND BOOK.

To the King.

1. It might seem to have more convenience, though it come often otherwise to pass (excellent King), that those which are fruitful in their generations, and have in themselves the foresight of immortality in their descendants, should likewise be more careful of the good estate of future times, unto which they know they must transmit and commend over their dearest pledges. Queen Elizabeth was a sojourner in the world in respect of her unmarried life, and was a blessing to her own times; and yet so as the impression of her good government, besides her happy memory, is not without some effect which doth survive her. But to your Majesty, whom God hath already blessed with so much royal issue, worthy to continue and represent you for ever, and whose youthful and fruitful bed doth yet promise many the like renovations, it is proper and agreeable to be conversant not only in the transitory parts of good government, but in those acts also which are in their nature permanent and perpetual. Amongst the which (if affection do not transport me) there is not any more worthy than the further endowment of the world with sound and fruitful knowledge. For why should a few received authors stand up like Hercules' columns, beyond which there should be no sailing or discovering, since we have so bright and benign a star as your Majesty to conduct and prosper us? To return therefore where we left, it remaineth to consider of what kind those acts are which have been undertaken and performed by kings and others for the increase and advancement of learning, wherein I purpose to speak actively, without digressing or dilating.

2. Let this ground therefore be laid, that all works are over common by amplitude of reward, by soundness of direction, and by the conjunction of labours. The first multiplieth endeavour, the second preventeth error, and the third supplieth the frailty of man. But the principal of these is direction, for claudus in via antevertit cursorem extra viam; and Solomon excellently setteth it down, "If the iron be not sharp, it requireth more strength, but wisdom is that which prevaieth," signifying that the invention or election of the mean is more effectual than any enforcement or accumulation of endeavours. This I am induced to speak, for that (not derogating from the noble intention of any that have been deservers towards the state of learning), I do observe nevertheless that their works and acts are rather matters of magnificence and memory than of progression and proficience, and tend rather to augment the mass of learning in the multitude of learned men than to rectify or raise the sciences themselves.

3. The works or acts of merit towards learning are conversant about three objects--the places of learning, the books of learning, and the persons of the learned. For as water, whether it be the dew of heaven or the springs of the earth, doth scatter and leese itself in the ground, except it be collected into some receptacle where it may by union comfort and sustain itself; and for that cause the industry of man hath made and framed springheads, conduits, cisterns, and pools, which men have accustomed likewise to beautify and adorn with accomplishments of magnificence and state, as well as of use and necessity; so this excellent liquor of knowledge, whether it descend from divine inspiration, or spring from human sense, would soon perish and vanish to oblivion, if it were not preserved in books, traditions, conferences, and places appointed, as universities, colleges, and schools, for the receipt and comforting of the same.

4. The works which concern the seats and places of learning are four--foundations and buildings, endowments with revenues, endowments with franchises and privileges, institutions and ordinances for government--all tending to quietness and privateness of life, and discharge of cares and troubles; much like the stations which Virgil prescribeth for the hiving of bees:

"Principio sedes apibus statioque petenda,
Quo neque sit ventis aditus, &c."

5. The works touching books are two--first, libraries, which are as the shrines where all the relics of the ancient saints, full of true virtue, and that without delusion or imposture, are preserved and reposed; secondly, new editions of authors, with more correct impressions, more faithful translations, more profitable glosses, more diligent annotations, and the like.

6. The works pertaining to the persons of learned men (besides the advancement and countenancing of them in general) are two--the reward and designation of readers in sciences already extant and invented; and the reward and designation of writers and inquirers concerning any parts of learning not sufficiently laboured and prosecuted.

7. These are summarily the works and acts wherein the merits of

many excellent princes and other worthy personages, have been conversant. As for any particular commemorations, I call to mind what Cicero said when he gave general thanks, *Difficile non aliquem, ingratum quenquam praeterire*. Let us rather, according to the Scriptures, look unto that part of the race which is before us, than look back to that which is already attained.

8. First, therefore, amongst so many great foundations of colleges in Europe, I find strange that they are all dedicated to professions, and none left free to arts and sciences at large. For if men judge that learning should be referred to action, they judge well; but in this they fall into the error described in the ancient fable, in which the other parts of the body did suppose the stomach had been idle, because it neither performed the office of motion, as the limbs do, nor of sense, as the head doth; but yet notwithstanding it is the stomach that digesteth and distributeth to all the rest. So if any man think philosophy and universality to be idle studies, he doth not consider that all professions are from thence served and supplied. And this I take to be a great cause that hath hindered the progression of learning, because these fundamental knowledges have been studied but in passage. For if you will have a tree bear more fruit than it hath used to do, it is not anything you can do to the boughs, but it is the stirring of the earth and putting new mould about thee roots that must work it. Neither is it to be forgotten, that this dedicating of foundations and dotations to professory learning hath not only had a malign aspect and influence upon the growth of sciences, but hath also been prejudicial to states, and governments. For hence it proceedeth that princes find a solitude in regard of able men to serve them in causes of estate, because there is no education collegiate which is free, where such as were so disposed might give themselves in histories, modern languages, books of policy and civil discourse, and other the like enablements unto service of estate.

9. And because founders of colleges do plant, and founders of lectures do water, it followeth well in order to speak of the defect which is in public lectures; namely, in the smallness, and meanness of the salary or reward which in most places is assigned unto them, whether they be lectures of arts, or of professions. For it is necessary to the progression of sciences that readers be of the most able and sufficient men; as those which are ordained for generating and propagating of sciences, and not for transitory use. This cannot be, except their condition and endowment be such as may content the ablest man to appropriate his whole labour and continue his whole age in that function and attendance; and therefore must have a proportion answerable to that mediocrity or competency of advancement, which may be expected from a profession or the practice of a profession. So as, if you will have sciences flourish, you must observe David's military law, which was, "That those which stayed with the carriage should have equal part with those which were in the action;" else will the carriages be ill attended. So readers in sciences are indeed the guardians of the stores and provisions of sciences, whence men in active courses are furnished, and therefore ought to have equal entertainment with them; otherwise if the fathers in sciences be of the weakest sort or be ill maintained,

"Et patrum invalidi referent jejunia nati."

10. Another defect I note, wherein I shall need some alchemist to help me, who call upon men to sell their books, and to build furnaces; quitting and forsaking Minerva and the Muses as barren virgins, and relying upon Vulcan. But certain it is, that unto the deep, fruitful, and operative study of many sciences, specialty natural philosophy and physic, books be not only the instrumentals; wherein also the beneficence of men hath not been altogether wanting. For we see spheres, globes, astrolabes, maps, and the like, have been provided as appurtenances to astronomy and cosmography, as well as books. We see likewise that some places instituted for physic have annexed the commodity of gardens for simples of all sorts, and do likewise command the use of dead bodies for anatomies. But these do respect but a few things. In general, there will hardly be any main proficience in the disclosing of nature, except there be some allowance for expenses about experiments; whether they be experiments appertaining to Vulcanus or Daedalus, furnace or engine, or any other kind. And therefore as secretaries and spials of princes and states bring in bills for intelligence, so you must allow the spials and intelligencers of nature to bring in their bills; or else you shall be ill advertised.

11. And if Alexander made such a liberal assignation to Aristotle of treasure for the allowance of hunters, fowlers, fishers, and the like, that he might compile a history of nature, much better do they deserve it that travail in arts of nature.

12. Another defect which I note is an intermission or neglect in those which are governors in universities, of consultation, and in princes or superior persons, of visitation: to enter into account and consideration, whether the readings, exercises, and other customs appertaining unto learning, anciently begun and since continued, be well instituted or no; and thereupon to ground an amendment or reformation in that which shall be found inconvenient. For it is one of your Majesty's own most wise and princely maxims, "That in all usages and precedents, the times be considered wherein they first began; which if they were weak or ignorant, it derogateth from the authority of the usage, and leaveth it for suspect." And therefore inasmuch as most of the usages and orders of the universities were derived from more obscure times, it is the more requisite they be re-examined. In this kind I will give an instance or two, for example sake, of things that are the most obvious and familiar. The one is a matter, which though it be ancient and general, yet I hold to be an error; which is, that scholars in universities come too soon and too unripe to logic and rhetoric, arts fitter for graduates than children and novices. For these two, rightly taken, are the gravest of sciences, being the arts of arts; the one for judgment, the other for ornament. And they be the rules and directions how to set forth and dispose matter: and therefore for minds empty and unfraught with matter, and which have not gathered that which Cicero calleth *sylva* and *supellex*, stuff and variety, to begin with those arts (as if one should learn to weigh, or to measure, or to paint the wind) doth work but this effect, that the wisdom of those arts, which is great and universal, is almost made contemptible, and is degenerate into childish sophistry and ridiculous affectation. And further, the untimely learning of them hath drawn on by consequence the superficial and unprofitable teaching and writing of them, as fitteth indeed to the capacity of

children. Another is a lack I find in the exercises used in the universities, which do make too great a divorce between invention and memory. For their speeches are either premeditated, in *verbis conceptis*, where nothing is left to invention, or merely extemporal, where little is left to memory. Whereas in life and action there is least use of either of these, but rather of intermixtures of premeditation and invention, notes and memory. So as the exercise fitteth not the practice, nor the image the life; and it is ever a true rule in exercises, that they be framed as near as may be to the life of practice; for otherwise they do pervert the motions and faculties of the mind, and not prepare them. The truth whereof is not obscure, when scholars come to the practices of professions, or other actions of civil life; which when they set into, this want is soon found by themselves, and sooner by others. But this part, touching the amendment of the institutions and orders of universities, I will conclude with the clause of Caesar's letter to Oppius and Balbus, *Hoc quemadmodum fieri possit, nonnulla mihi in mentem veniunt, et multa reperiri possunt: de iis rebus rogo vos ut cogitationem suscipiatis.*

13. Another defect which I note ascendeth a little higher than the precedent. For as the proficiencie of learning consisteth much in the orders and institutions of universities in the same states and kingdoms, so it would be yet more advanced, if there were more intelligence mutual between the universities of Europe than now there is. We see there be many orders and foundations, which though they be divided under several sovereignties and territories, yet they take themselves to have a kind of contract, fraternity, and correspondence one with the other, insomuch as they have provincials and generals. And surely as nature createth brotherhood in families, and arts mechanical contract brotherhoods in communalities, and the anointment of God superinduceth a brotherhood in kings and bishops, so in like manner there cannot but be a fraternity in learning and illumination, relating to that paternity which is attributed to God, who is called the Father of illuminations or lights.

14. The last defect which I will note is, that there hath not been, or very rarely been, any public designation of writers or inquirers concerning such parts of knowledge as may appear not to have been already sufficiently laboured or undertaken; unto which point it is an inducement to enter into a view and examination what parts of learning have been prosecuted, and what omitted. For the opinion of plenty is amongst the causes of want, and the great quantity of books maketh a show rather of superfluity than lack; which surcharge nevertheless is not to be remedied by making no more books, but by making more good books, which, as the serpent of Moses, might devour the serpents of the enchanters.

15. The removing of all the defects formerly enumerate, except the last, and of the active part also of the last (which is the designation of writers), are *opera basilica*; towards which the endeavours of a private man may be but as an image in a crossway, that may point at the way, but cannot go it. But the inducing part of the latter (which is the survey of learning) may be set forward by private travail. Wherefore I will now attempt to make a general and faithful perambulation of learning, with an inquiry what parts thereof lie fresh and waste, and not improved and converted by the industry of man, to the end that such a plot made and recorded to

memory may both minister light to any public designation, and, also serve to excite voluntary endeavours. Wherein, nevertheless, my purpose is at this time to note only omissions and deficiencies, and not to make any redargution of errors or incomplete prosecutions. For it is one thing to set forth what ground lieth unmanured, and another thing to correct ill husbandry in that which is manured.

In the handling and undertaking of which work I am not ignorant what it is that I do now move and attempt, nor insensible of mine own weakness to sustain my purpose. But my hope is, that if my extreme love to learning carry me too far, I may obtain the excuse of affection; for that "It is not granted to man to love and to be wise." But I know well I can use no other liberty of judgment than I must leave to others; and I for my part shall be indifferently glad either to perform myself, or accept from another, that duty of humanity--*Nam qui erranti comiter monstrat viam, &c.* I do foresee likewise that of those things which I shall enter and register as deficiencies and omissions, many will conceive and censure that some of them are already done and extant; others to be but curiosities, and things of no great use; and others to be of too great difficulty, and almost impossibility to be compassed and effected. But for the two first, I refer myself to the particulars. For the last, touching impossibility, I take it those things are to be held possible which may be done by some person, though not by every one; and which may be done by many, though not by any one; and which may be done in the succession of ages, though not within the hourglass of one man's life; and which may be done by public designation, though not by private endeavour. But, notwithstanding, if any man will take to himself rather that of Solomon, "*Dicit piger, Leo est in via,*" than that of Virgil, "*Possunt quia posse videntur,*" I shall be content that my labours be esteemed but as the better sort of wishes; for as it asketh some knowledge to demand a question not impertinent, so it requireth some sense to make a wish not absurd.

I. (1) The parts of human learning have reference to the three parts of man's understanding, which is the seat of learning: history to his memory, poesy to his imagination, and philosophy to his reason. Divine learning receiveth the same distribution; for, the spirit of man is the same, though the revelation of oracle and sense be diverse. So as theology consisteth also of history of the Church; of parables, which is divine poesy; and of holy doctrine or precept. For as for that part which seemeth supernumerary, which is prophecy, it is but divine history, which hath that prerogative over human, as the narration may be before the fact as well as after.

(2) History is natural, civil, ecclesiastical, and literary; whereof the first three I allow as extant, the fourth I note as deficient. For no man hath propounded to himself the general state of learning to be described and represented from age to age, as many have done the works of Nature, and the state, civil and ecclesiastical; without which the history of the world seemeth to me to be as the statue of Polyphemus with his eye out, that part being wanting which doth most show the spirit and life of the person. And yet I am not ignorant that in divers particular sciences, as of the jurisconsults, the mathematicians, the rhetoricians, the philosophers, there are set down some small memorials of the schools, authors, and books; and so likewise some barren relations touching the invention of arts or usages. But a just story of learning, containing the antiquities and originals of knowledges and

their sects, their inventions, their traditions, their diverse administrations and managings, their flourishings, their oppositions, decays, depressions, oblivions, removes, with the causes and occasions of them, and all other events concerning learning, throughout the ages of the world, I may truly affirm to be wanting; the use and end of which work I do not so much design for curiosity or satisfaction of those that are the lovers of learning, but chiefly for a more serious and grave purpose, which is this in few words, that it will make learned men wise in the use and administration of learning. For it is not Saint Augustine's nor Saint Ambrose's works that will make so wise a divine as ecclesiastical history thoroughly read and observed, and the same reason is of learning.

(3) History of Nature is of three sorts; of Nature in course, of Nature erring or varying, and of Nature altered or wrought; that is, history of creatures, history of marvels, and history of arts. The first of these no doubt is extant, and that in good perfection; the two latter are bandied so weakly and unprofitably as I am moved to note them as deficient. For I find no sufficient or competent collection of the works of Nature which have a digression and deflexion from the ordinary course of generations, productions, and motions; whether they be singularities of place and region, or the strange events of time and chance, or the effects of yet unknown properties, or the instances of exception to general kinds. It is true I find a number of books of fabulous experiments and secrets, and frivolous impostures for pleasure and strangeness; but a substantial and severe collection of the heteroclitics or irregulars of Nature, well examined and described, I find not, specially not with due rejection of fables and popular errors. For as things now are, if an untruth in Nature be once on foot, what by reason of the neglect of examination, and countenance of antiquity, and what by reason of the use of the opinion in similitudes and ornaments of speech, it is never called down.

(4) The use of this work, honoured with a precedent in Aristotle, is nothing less than to give contentment to the appetite of curious and vain wits, as the manner of Mirabilaries is to do; but for two reasons, both of great weight: the one to correct the partiality of axioms and opinions, which are commonly framed only upon common and familiar examples; the other because from the wonders of Nature is the nearest intelligence and passage towards the wonders of art, for it is no more but by following and, as it were, hounding Nature in her wanderings, to be able to lead her afterwards to the same place again. Neither am I of opinion, in this history of marvels, that superstitious narrations of sorceries, witchcrafts, dreams, divinations, and the like, where there is an assurance and clear evidence of the fact, be altogether excluded. For it is not yet known in what cases and how far effects attributed to superstition do participate of natural causes; and, therefore, howsoever the practice of such things is to be condemned, yet from the speculation and consideration of them light may be taken, not only for the discerning of the offences, but for the further disclosing of Nature. Neither ought a man to make scruple of entering into these things for inquisition of truth, as your Majesty hath showed in your own example, who, with the two clear eyes of religion and natural philosophy, have looked deeply and wisely into these shadows, and yet proved yourself to be of the nature of the sun, which passeth through pollutions and itself remains as pure as before. But this I

hold fit, that these narrations, which have mixture with superstition, be sorted by themselves, and not to be mingled with the narrations which are merely and sincerely natural. But as for the narrations touching the prodigies and miracles of religions, they are either not true or not natural; and, therefore, impertinent for the story of Nature.

(5) For history of Nature, wrought or mechanical, I find some collections made of agriculture, and likewise of manual arts; but commonly with a rejection of experiments familiar and vulgar; for it is esteemed a kind of dishonour unto learning to descend to inquiry or meditation upon matters mechanical, except they be such as may be thought secrets, rarities, and special subtleties; which humour of vain and supercilious arrogancy is justly derided in Plato, where he brings in Hippias, a vaunting sophist, disputing with Socrates, a true and unfeigned inquisitor of truth; where, the subject being touching beauty, Socrates, after his wandering manner of inductions, put first an example of a fair virgin, and then of a fair horse, and then of a fair pot well glazed, whereat Hippias was offended, and said, "More than for courtesy's sake, he did think much to dispute with any that did allege such base and sordid instances." Whereunto Socrates answereth, "You have reason, and it becomes you well, being a man so trim in your vestments," &c., and so goeth on in an irony. But the truth is, they be not the highest instances that give the securest information, as may be well expressed in the tale so common of the philosopher that, while he gazed upwards to the stars, fell into the water; for if he had looked down he might have seen the stars in the water, but looking aloft he could not see the water in the stars. So it cometh often to pass that mean and small things discover great, better than great can discover the small; and therefore Aristotle noteth well, "That the nature of everything is best seen in his smallest portions." And for that cause he inquireth the nature of a commonwealth, first in a family, and the simple conjugations of man and wife, parent and child, master and servant, which are in every cottage. Even so likewise the nature of this great city of the world, and the policy thereof, must be first sought in mean concordances and small portions. So we see how that secret of Nature, of the turning of iron touched with the loadstone towards the north, was found out in needles of iron, not in bars of iron.

(6) But if my judgment be of any weight, the use of history mechanical is of all others the most radical and fundamental towards natural philosophy; such natural philosophy as shall not vanish in the fume of subtle, sublime, or delectable speculation, but such as shall be operative to the endowment and benefit of man's life. For it will not only minister and suggest for the present many ingenious practices in all trades, by a connection and transferring of the observations of one art to the use of another, when the experiences of several mysteries shall fall under the consideration of one man's mind; but further, it will give a more true and real illumination concerning causes and axioms than is hitherto attained. For like as a man's disposition is never well known till he be crossed, nor Proteus ever changed shapes till he was straitened and held fast; so the passages and variations of nature cannot appear so fully in the liberty of nature as in the trials and vexations of art.

II. (1) For civil history, it is of three kinds; not unfitly to be compared with the three kinds of pictures or images. For of

pictures or images we see some are unfinished, some are perfect, and some are defaced. So of histories we may find three kinds: memorials, perfect histories, and antiquities; for memorials are history unfinished, or the first or rough drafts of history; and antiquities are history defaced, or some remnants of history which have casually escaped the shipwreck of time.

(2) Memorials, or preparatory history, are of two sorts; whereof the one may be termed commentaries, and the other registers. Commentaries are they which set down a continuance of the naked events and actions, without the motives or designs, the counsels, the speeches, the pretexts, the occasions, and other passages of action. For this is the true nature of a commentary (though Caesar, in modesty mixed with greatness, did for his pleasure apply the name of a commentary to the best history of the world). Registers are collections of public acts, as decrees of council, judicial proceedings, declarations and letters of estate, orations, and the like, without a perfect continuance or contexture of the thread of the narration.

(3) Antiquities, or remnants of history, are, as was said, *tanquam tabula naufragii*: when industrious persons, by an exact and scrupulous diligence and observation, out of monuments, names, words, proverbs, traditions, private records and evidences, fragments of stories, passages of books that concern not story, and the like, do save and recover somewhat from the deluge of time.

(4) In these kinds of unperfect histories I do assign no deficiency, for they are *tanquam imperfecte mista*; and therefore any deficiency in them is but their nature. As for the corruptions and moths of history, which are epitomes, the use of them deserveth to be banished, as all men of sound judgment have confessed, as those that have fretted and corroded the sound bodies of many excellent histories, and wrought them into base and unprofitable dregs.

(5) History, which may be called just and perfect history, is of three kinds, according to the object which it propoundeth, or pretendeth to represent: for it either representeth a time, or a person, or an action. The first we call chronicles, the second lives, and the third narrations or relations. Of these, although the first be the most complete and absolute kind of history, and hath most estimation and glory, yet the second excelleth it in profit and use, and the third in verity and sincerity. For history of times representeth the magnitude of actions, and the public faces and deportments of persons, and passeth over in silence the smaller passages and motions of men and matters. But such being the workmanship of God, as He doth hang the greatest weight upon the smallest wires, *maxima e minimis, suspendens*, it comes therefore to pass, that such histories do rather set forth the pomp of business than the true and inward resorts thereof. But lives, if they be well written, propounding to themselves a person to represent, in whom actions, both greater and smaller, public and private, have a commixture, must of necessity contain a more true, native, and lively representation. So again narrations and relations of actions, as the war of Peloponnesus, the expedition of Cyrus Minor, the conspiracy of Catiline, cannot but be more purely and exactly true than histories of times, because they may choose an argument comprehensible within the notice and instructions of the writer: whereas he that undertaketh the story of a time, specially of any

length, cannot but meet with many blanks and spaces, which he must be forced to fill up out of his own wit and conjecture.

(6) For the history of times, I mean of civil history, the providence of God hath made the distribution. For it hath pleased God to ordain and illustrate two exemplar states of the world for arms, learning, moral virtue, policy, and laws; the state of Graecia and the state of Rome; the histories whereof occupying the middle part of time, have more ancient to them histories which may by one common name be termed the antiquities of the world; and after them, histories which may be likewise called by the name of modern history.

(7) Now to speak of the deficiencies. As to the heathen antiquities of the world it is in vain to note them for deficient. Deficient they are no doubt, consisting most of fables and fragments; but the deficiency cannot be holpen; for antiquity is like fame, caput inter nubila condit, her head is muffled from our sight. For the history of the exemplar states, it is extant in good perfection. Not but I could wish there were a perfect course of history for Graecia, from Theseus to Philopoemen (what time the affairs of Graecia drowned and extinguished in the affairs of Rome), and for Rome from Romulus to Justinianus, who may be truly said to be ultimus Romanorum. In which sequences of story the text of Thucydides and Xenophon in the one, and the texts of Livius, Polybius, Sallustius, Caesar, Appianus, Tacitus, Herodianus in the other, to be kept entire, without any diminution at all, and only to be supplied and continued. But this is a matter of magnificence, rather to be commended than required; and we speak now of parts of learning supplemental, and not of supererogation.

(8) But for modern histories, whereof there are some few very worthy, but the greater part beneath mediocrity, leaving the care of foreign stories to foreign states, because I will not be curiosus in aliena republica, I cannot fail to represent to your Majesty the unworthiness of the history of England in the main continuance thereof, and the partiality and obliquity of that of Scotland in the latest and largest author that I have seen: supposing that it would be honour for your Majesty, and a work very memorable, if this island of Great Britain, as it is now joined in monarchy for the ages to come, so were joined in one history for the times passed, after the manner of the sacred history, which draweth down the story of the ten tribes and of the two tribes as twins together. And if it shall seem that the greatness of this work may make it less exactly performed, there is an excellent period of a much smaller compass of time, as to the story of England; that is to say, from the uniting of the Roses to the uniting of the kingdoms; a portion of time wherein, to my understanding, there hath been the rarest varieties that in like number of successions of any hereditary monarchy hath been known. For it beginneth with the mixed adoption of a crown by arms and title; an entry by battle, an establishment by marriage; and therefore times answerable, like waters after a tempest, full of working and swelling, though without extremity of storm; but well passed through by the wisdom of the pilot, being one of the most sufficient kings of all the number. Then followeth the reign of a king, whose actions, howsoever conducted, had much intermixture with the affairs of Europe, balancing and inclining them variably; in whose time also began that great alteration in the state ecclesiastical, an action which seldom cometh upon the stage.

Then the reign of a minor; then an offer of a usurpation (though it was but as febris ephemera). Then the reign of a queen matched with a foreigner; then of a queen that lived solitary and unmarried, and yet her government so masculine, as it had greater impression and operation upon the states abroad than it any ways received from thence. And now last, this most happy and glorious event, that this island of Britain, divided from all the world, should be united in itself, and that oracle of rest given to AENEAS, antiquam exquirite matrem, should now be performed and fulfilled upon the nations of England and Scotland, being now reunited in the ancient mother name of Britain, as a full period of all instability and peregrinations. So that as it cometh to pass in massive bodies, that they have certain trepidations and waverings before they fix and settle, so it seemeth that by the providence of God this monarchy, before it was to settle in your majesty and your generations (in which I hope it is now established for ever), it had these prelusive changes and varieties.

(9) For lives, I do find strange that these times have so little esteemed the virtues of the times, as that the writings of lives should be no more frequent. For although there be not many sovereign princes or absolute commanders, and that states are most collected into monarchies, yet are there many worthy personages that deserve better than dispersed report or barren eulogies. For herein the invention of one of the late poets is proper, and doth well enrich the ancient fiction. For he feigneth that at the end of the thread or web of every man's life there was a little medal containing the person's name, and that Time waited upon the shears, and as soon as the thread was cut caught the medals, and carried them to the river of Lethe; and about the bank there were many birds flying up and down, that would get the medals and carry them in their beak a little while, and then let them fall into the river. Only there were a few swans, which if they got a name would carry it to a temple where it was consecrate. And although many men, more mortal in their affections than in their bodies, do esteem desire of name and memory but as a vanity and ventosity,

"Animi nil magnae laudis egentis;"

which opinion cometh from that root, Non prius laudes contempsimus, quam laudanda facere desivimus: yet that will not alter Solomon's judgment, Memoria justi cum laudibus, at impiorum nomen putrescet: the one flourisheth, the other either consumeth to present oblivion, or turneth to an ill odour. And therefore in that style or addition, which is and hath been long well received and brought in use, felicis memoriae, piae memoriae, bonae memoriae, we do acknowledge that which Cicero saith, borrowing it from Demosthenes, that bona fama propria possessio defunctorum; which possession I cannot but note that in our times it lieth much waste, and that therein there is a deficiency.

(10) For narrations and relations of particular actions, there were also to be wished a greater diligence therein; for there is no great action but hath some good pen which attends it. And because it is an ability not common to write a good history, as may well appear by the small number of them; yet if particularity of actions memorable were but tolerably reported as they pass, the compiling of a

complete history of times might be the better expected, when a writer should arise that were fit for it: for the collection of such relations might be as a nursery garden, whereby to plant a fair and stately garden when time should serve.

(11) There is yet another partition of history which Cornelius Tacitus maketh, which is not to be forgotten, specially with that application which he accoupleth it withal, annals and journals: appropriating to the former matters of estate, and to the latter acts and accidents of a meaner nature. For giving but a touch of certain magnificent buildings, he addeth, *Cum ex dignitate populi Romani repertum sit, res illustres annalibus, talia diurnis urbis actis mandare*. So as there is a kind of contemplative heraldry, as well as civil. And as nothing doth derogate from the dignity of a state more than confusion of degrees, so it doth not a little imbase the authority of a history to intermingle matters of triumph, or matters of ceremony, or matters of novelty, with matters of state. But the use of a journal hath not only been in the history of time, but likewise in the history of persons, and chiefly of actions; for princes in ancient time had, upon point of honour and policy both, journals kept, what passed day by day. For we see the chronicle which was read before Ahasuerus, when he could not take rest, contained matter of affairs, indeed, but such as had passed in his own time and very lately before. But the journal of Alexander's house expressed every small particularity, even concerning his person and court; and it is yet a use well received in enterprises memorable, as expeditions of war, navigations, and the like, to keep diaries of that which passeth continually.

(12) I cannot likewise be ignorant of a form of writing which some grave and wise men have used, containing a scattered history of those actions which they have thought worthy of memory, with politic discourse and observation thereupon: not incorporate into the history, but separately, and as the more principal in their intention; which kind of ruminated history I think more fit to place amongst books of policy, whereof we shall hereafter speak, than amongst books of history. For it is the true office of history to represent the events themselves together with the counsels, and to leave the observations and conclusions thereupon to the liberty and faculty of every man's judgment. But mixtures are things irregular, whereof no man can define.

(13) So also is there another kind of history manifoldly mixed, and that is history of cosmography: being compounded of natural history, in respect of the regions themselves; of history civil, in respect of the habitations, regiments, and manners of the people; and the mathematics, in respect of the climates and configurations towards the heavens: which part of learning of all others in this latter time hath obtained most proficience. For it may be truly affirmed to the honour of these times, and in a virtuous emulation with antiquity, that this great building of the world had never through-lights made in it, till the age of us and our fathers. For although they had knowledge of the antipodes,

"Nosque ubi primus equis Oriens afflavit anhelis,
Illic sera rubens accendit lumina Vesper,"

yet that might be by demonstration, and not in fact; and if by travel, it requireth the voyage but of half the globe. But to circle the earth, as the heavenly bodies do, was not done nor enterprised till these later times: and therefore these times may justly bear in their word, not only plus ultra, in precedence of the ancient non ultra, and imitabile fulmen, in precedence of the ancient non imitabile fulmen,

"Demens qui nimbos et non imitabile fulmen," &c.

but likewise imitabile caelum; in respect of the many memorable voyages after the manner of heaven about the globe of the earth.

(14) And this proficience in navigation and discoveries may plant also an expectation of the further proficience and augmentation of all sciences; because it may seem they are ordained by God to be coevals, that is, to meet in one age. For so the prophet Daniel speaking of the latter times foretelleth, *Plurimi pertransibunt, et multiplex erit scientia*: as if the openness and through-passage of the world and the increase of knowledge were appointed to be in the same ages; as we see it is already performed in great part: the learning of these later times not much giving place to the former two periods or returns of learning, the one of the Grecians, the other of the Romans.

III. (1) History ecclesiastical receiveth the same divisions with history civil: but further in the propriety thereof may be divided into the history of the Church, by a general name; history of prophecy; and history of providence. The first describeth the times of the militant Church, whether it be fluctuant, as the ark of Noah, or movable, as the ark in the wilderness, or at rest, as the ark in the Temple: that is, the state of the Church in persecution, in remove, and in peace. This part I ought in no sort to note as deficient; only I would that the virtue and sincerity of it were according to the mass and quantity. But I am not now in hand with censures, but with omissions.

(2) The second, which is history of prophecy, consisteth of two relatives--the prophecy and the accomplishment; and, therefore, the nature of such a work ought to be, that every prophecy of the Scripture be sorted with the event fulfilling the same throughout the ages of the world, both for the better confirmation of faith and for the better illumination of the Church touching those parts of prophecies which are yet unfulfilled: allowing, nevertheless, that latitude which is agreeable and familiar unto divine prophecies, being of the nature of their Author, with whom a thousand years are but as one day, and therefore are not fulfilled punctually at once, but have springing and germinant accomplishment throughout many ages, though the height or fulness of them may refer to some one age. This is a work which I find deficient, but is to be done with wisdom, sobriety, and reverence, or not at all.

(3) The third, which is history of Providence, containeth that excellent correspondence which is between God's revealed will and His secret will; which though it be so obscure, as for the most part it is not legible to the natural man--no, nor many times to those that behold it from the tabernacle--yet, at some times it pleaseth

God, for our better establishment and the confuting of those which are as without God in the world, to write it in such text and capital letters, that, as the prophet saith, "He that runneth by may read it"--that is, mere sensual persons, which hasten by God's judgments, and never bend or fix their cogitations upon them, are nevertheless in their passage and race urged to discern it. Such are the notable events and examples of God's judgments, chastisements, deliverances, and blessings; and this is a work which has passed through the labour of many, and therefore I cannot present as omitted.

(4) There are also other parts of learning which are appendices to history. For all the exterior proceedings of man consist of words and deeds, whereof history doth properly receive and retain in memory the deeds; and if words, yet but as inducements and passages to deeds; so are there other books and writings which are appropriate to the custody and receipt of words only, which likewise are of three sorts--orations, letters, and brief speeches or sayings. Orations are pleadings, speeches of counsel, laudatives, invectives, apologies, reprehensions, orations of formality or ceremony, and the like. Letters are according to all the variety of occasions, advertisements, advises, directions, propositions, petitions, commendatory, expostulatory, satisfactory, of compliment, of pleasure, of discourse, and all other passages of action. And such as are written from wise men, are of all the words of man, in my judgment, the best; for they are more natural than orations and public speeches, and more advised than conferences or present speeches. So again letters of affairs from such as manage them, or are privy to them, are of all others the best instructions for history, and to a diligent reader the best histories in themselves. For apophthegms, it is a great loss of that book of Caesar's; for as his history, and those few letters of his which we have, and those apophthegms which were of his own, excel all men's else, so I suppose would his collection of apophthegms have done; for as for those which are collected by others, either I have no taste in such matters or else their choice hath not been happy. But upon these three kinds of writings I do not insist, because I have no deficiencies to propound concerning them.

(5) Thus much therefore concerning history, which is that part of learning which answereth to one of the cells, domiciles, or offices of the mind of man, which is that of the memory.

IV. (1) Poesy is a part of learning in measure of words, for the most part restrained, but in all other points extremely licensed, and doth truly refer to the imagination; which, being not tied to the laws of matter, may at pleasure join that which nature hath severed, and sever that which nature hath joined, and so make unlawful matches and divorces of things--*Pictoribus atque poetis*, &c. It is taken in two senses in respect of words or matter. In the first sense, it is but a character of style, and belongeth to arts of speech, and is not pertinent for the present. In the latter, it is--as hath been said--one of the principal portions of learning, and is nothing else but feigned history, which may be styled as well in prose as in verse.

(2) The use of this feigned history hath been to give some shadow of satisfaction to the mind of man in those points wherein the nature of things doth deny it, the world being in proportion inferior to

the soul; by reason whereof there is, agreeable to the spirit of man, a more ample greatness, a more exact goodness, and a more absolute variety, than can be found in the nature of things. Therefore, because the acts or events of true history have not that magnitude which satisfieth the mind of man, poesy feigneth acts and events greater and more heroical. Because true history propoundeth the successes and issues of actions not so agreeable to the merits of virtue and vice, therefore poesy feigns them more just in retribution, and more according to revealed Providence. Because true history representeth actions and events more ordinary and less interchanged, therefore poesy endueth them with more rareness and more unexpected and alternative variations. So as it appeareth that poesy serveth and conferreth to magnanimity, morality and to delectation. And therefore, it was ever thought to have some participation of divineness, because it doth raise and erect the mind, by submitting the shows of things to the desires of the mind; whereas reason doth buckle and bow the mind unto the nature of things. And we see that by these insinuations and congruities with man's nature and pleasure, joined also with the agreement and consort it hath with music, it hath had access and estimation in rude times and barbarous regions, where other learning stood excluded.

(3) The division of poesy which is aptest in the propriety thereof (besides those divisions which are common unto it with history, as feigned chronicles, feigned lives, and the appendices of history, as feigned epistles, feigned orations, and the rest) is into poesy narrative, representative, and allusive. The narrative is a mere imitation of history, with the excesses before remembered, choosing for subjects commonly wars and love, rarely state, and sometimes pleasure or mirth. Representative is as a visible history, and is an image of actions as if they were present, as history is of actions in nature as they are (that is) past. Allusive, or parabolical, is a narration applied only to express some special purpose or conceit; which latter kind of parabolical wisdom was much more in use in the ancient times, as by the fables of AEsop, and the brief sentences of the seven, and the use of hieroglyphics may appear. And the cause was (for that it was then of necessity to express any point of reason which was more sharp or subtle than the vulgar in that manner) because men in those times wanted both variety of examples and subtlety of conceit. And as hieroglyphics were before letters, so parables were before arguments; and nevertheless now and at all times they do retain much life and rigour, because reason cannot be so sensible nor examples so fit.

(4) But there remaineth yet another use of poesy parabolical, opposite to that which we last mentioned; for that tendeth to demonstrate and illustrate that which is taught or delivered, and this other to retire and obscure it--that is, when the secrets and mysteries of religion, policy, or philosophy, are involved in fables or parables. Of this in divine poesy we see the use is authorised. In heathen poesy we see the exposition of fables doth fall out sometimes with great felicity: as in the fable that the giants being overthrown in their war against the gods, the earth their mother in revenge thereof brought forth Fame:

"Illam terra parens, ira irritat Deorum,
Extremam, ut perhibent, Coeo Enceladoque soroem,

Progenit."

Expounded that when princes and monarchs have suppressed actual and open rebels, then the malignity of people (which is the mother of rebellion) doth bring forth libels and slanders, and taxations of the states, which is of the same kind with rebellion but more feminine. So in the fable that the rest of the gods having conspired to bind Jupiter, Pallas called Briareus with his hundred hands to his aid: expounded that monarchies need not fear any curbing of their absoluteness by mighty subjects, as long as by wisdom they keep the hearts of the people, who will be sure to come in on their side. So in the fable that Achilles was brought up under Chiron, the centaur, who was part a man and part a beast, expounded ingeniously but corruptly by Machiavel, that it belongeth to the education and discipline of princes to know as well how to play the part of a lion in violence, and the fox in guile, as of the man in virtue and justice. Nevertheless, in many the like encounters, I do rather think that the fable was first, and the exposition devised, than that the moral was first, and thereupon the fable framed; for I find it was an ancient vanity in Chrysippus, that troubled himself with great contention to fasten the assertions of the Stoics upon the fictions of the ancient poets; but yet that all the fables and fictions of the poets were but pleasure and not figure, I interpose no opinion. Surely of these poets which are now extant, even Homer himself (notwithstanding he was made a kind of scripture by the later schools of the Grecians), yet I should without any difficulty pronounce that his fables had no such inwardness in his own meaning. But what they might have upon a more original tradition is not easy to affirm, for he was not the inventor of many of them.

(5) In this third part of learning, which is poesy, I can report no deficiency; for being as a plant that cometh of the lust of the earth, without a formal seed, it hath sprung up and spread abroad more than any other kind. But to ascribe unto it that which is due, for the expressing of affections, passions, corruptions, and customs, we are beholding to poets more than to the philosophers' works; and for wit and eloquence, not much less than to orators' harangues. But it is not good to stay too long in the theatre. Let us now pass on to the judicial place or palace of the mind, which we are to approach and view with more reverence and attention.

V. (1) The knowledge of man is as the waters, some descending from above, and some springing from beneath: the one informed by the light of nature, the other inspired by divine revelation. The light of nature consisteth in the notions of the mind and the reports of the senses; for as for knowledge which man receiveth by teaching, it is cumulative and not original, as in a water that besides his own spring-head is fed with other springs and streams. So then, according to these two differing illuminations or originals, knowledge is first of all divided into divinity and philosophy.

(2) In philosophy the contemplations of man do either penetrate unto God, or are circumferred to nature, or are reflected or reverted upon himself. Out of which several inquiries there do arise three knowledges--divine philosophy, natural philosophy, and human philosophy or humanity. For all things are marked and stamped with

this triple character--the power of God, the difference of nature and the use of man. But because the distributions and partitions of knowledge are not like several lines that meet in one angle, and so touch but in a point, but are like branches of a tree that meet in a stem, which hath a dimension and quantity of entireness and continuance before it come to discontinue and break itself into arms and boughs; therefore it is good, before we enter into the former distribution, to erect and constitute one universal science, by the name of philosophia prima, primitive or summary philosophy, as the main and common way, before we come where the ways part and divide themselves; which science whether I should report as deficient or no, I stand doubtful. For I find a certain rhapsody of natural theology, and of divers parts of logic; and of that part of natural philosophy which concerneth the principles, and of that other part of natural philosophy which concerneth the soul or spirit--all these strangely commixed and confused; but being examined, it seemeth to me rather a depredation of other sciences, advanced and exalted unto some height of terms, than anything solid or substantive of itself. Nevertheless I cannot be ignorant of the distinction which is current, that the same things are handled but in several respects. As for example, that logic considereth of many things as they are in notion, and this philosophy as they are in nature--the one in appearance, the other in existence; but I find this difference better made than pursued. For if they had considered quantity, similitude, diversity, and the rest of those extern characters of things, as philosophers, and in nature, their inquiries must of force have been of a far other kind than they are. For doth any of them, in handling quantity, speak of the force of union, how and how far it multiplieth virtue? Doth any give the reason why some things in nature are so common, and in so great mass, and others so rare, and in so small quantity? Doth any, in handling similitude and diversity, assign the cause why iron should not move to iron, which is more like, but move to the loadstone, which is less like? Why in all diversities of things there should be certain participles in nature which are almost ambiguous to which kind they should be referred? But there is a mere and deep silence touching the nature and operation of those common adjuncts of things, as in nature; and only a resuming and repeating of the force and use of them in speech or argument. Therefore, because in a writing of this nature I avoid all subtlety, my meaning touching this original or universal philosophy is thus, in a plain and gross description by negative: "That it be a receptacle for all such profitable observations and axioms as fall not within the compass of any of the special parts of philosophy or sciences, but are more common and of a higher stage."

(3) Now that there are many of that kind need not be doubted. For example: Is not the rule, *Si inoequalibus aequalia addas, omnia erunt inaequalia*, an axiom as well of justice as of the mathematics? and is there not a true coincidence between commutative and distributive justice, and arithmetical and geometrical proportion? Is not that other rule, *Quae in eodem tertio conveniunt, et inter se conveniunt*, a rule taken from the mathematics, but so potent in logic as all syllogisms are built upon it? Is not the observation, *Omnia mutantur, nil interit*, a contemplation in philosophy thus, that the quantum of nature is eternal? in natural theology thus, that it requireth the same omnipotency to make somewhat nothing, which at the first made nothing somewhat? according to the Scripture, *Didici quod omnia opera, quoe fecit Deus, perseverent in perpetuum; non possumus eis quicquam addere nec auferre*. Is not the

ground, which Machiavel wisely and largely discourseth concerning governments, that the way to establish and preserve them is to reduce them ad principia--a rule in religion and nature, as well as in civil administration? Was not the Persian magic a reduction or correspondence of the principles and architectures of nature to the rules and policy of governments? Is not the precept of a musician, to fall from a discord or harsh accord upon a concord or sweet accord, alike true in affection? Is not the trope of music, to avoid or slide from the close or cadence, common with the trope of rhetoric of deceiving expectation? Is not the delight of the quavering upon a stop in music the same with the playing of light upon the water?

"Splendet tremulo sub lumine pontus."

Are not the organs of the senses of one kind with the organs of reflection, the eye with a glass, the ear with a cave or strait, determined and bounded? Neither are these only similitudes, as men of narrow observation may conceive them to be, but the same footsteps of nature, treading or printing upon several subjects or matters. This science therefore (as I understand it) I may justly report as deficient; for I see sometimes the profounder sort of wits, in handling some particular argument, will now and then draw a bucket of water out of this well for their present use; but the spring-head thereof seemeth to me not to have been visited, being of so excellent use both for the disclosing of nature and the abridgment of art.

VI. (1) This science being therefore first placed as a common parent like unto Berecynthia, which had so much heavenly issue, omnes coelicolas, omnes supera alta tenetes; we may return to the former distribution of the three philosophies--divine, natural, and human. And as concerning divine philosophy or natural theology, it is that knowledge or rudiment of knowledge concerning God which may be obtained by the contemplation of His creatures; which knowledge may be truly termed divine in respect of the object, and natural in respect of the light. The bounds of this knowledge are, that it sufficeth to convince atheism, but not to inform religion; and therefore there was never miracle wrought by God to convert an atheist, because the light of nature might have led him to confess a God; but miracles have been wrought to convert idolaters and the superstitious, because no light of nature extendeth to declare the will and true worship of God. For as all works do show forth the power and skill of the workman, and not his image, so it is of the works of God, which do show the omnipotency and wisdom of the Maker, but not His image. And therefore therein the heathen opinion differeth from the sacred truth: for they supposed the world to be the image of God, and man to be an extract or compendious image of the world; but the Scriptures never vouchsafe to attribute to the world that honour, as to be the image of God, but only THE WORK OF HIS HANDS; neither do they speak of any other image of God but man. Wherefore by the contemplation of nature to induce and enforce the acknowledgment of God, and to demonstrate His power, providence, and goodness, is an excellent argument, and hath been excellently handled by divers, but on the other side, out of the contemplation of nature, or ground of human knowledges, to induce any verity or persuasion concerning the points of faith, is in my judgment not

safe; *Da fidei quae fidei sunt*. For the heathen themselves conclude as much in that excellent and divine fable of the golden chain, "That men and gods were not able to draw Jupiter down to the earth; but, contrariwise, Jupiter was able to draw them up to heaven." So as we ought not to attempt to draw down or submit the mysteries of God to our reason, but contrariwise to raise and advance our reason to the divine truth. So as in this part of knowledge, touching divine philosophy, I am so far from noting any deficiency, as I rather note an excess; whereunto I have digressed because of the extreme prejudice which both religion and philosophy hath received and may receive by being commixed together; as that which undoubtedly will make an heretical religion, and an imaginary and fabulous philosophy.

(2) Otherwise it is of the nature of angels and spirits, which is an appendix of theology, both divine and natural, and is neither inscrutable nor interdicted. For although the Scripture saith, "Let no man deceive you in sublime discourse touching the worship of angels, pressing into that he knoweth not," &c., yet notwithstanding if you observe well that precept, it may appear thereby that there be two things only forbidden--adoration of them, and opinion fantastical of them, either to extol them further than appertaineth to the degree of a creature, or to extol a man's knowledge of them further than he hath ground. But the sober and grounded inquiry, which may arise out of the passages of Holy Scriptures, or out of the gradations of nature, is not restrained. So of degenerate and revolted spirits, the conversing with them or the employment of them is prohibited, much more any veneration towards them; but the contemplation or science of their nature, their power, their illusions, either by Scripture or reason, is a part of spiritual wisdom. For so the apostle saith, "We are not ignorant of his stratagems." And it is no more unlawful to inquire the nature of evil spirits, than to inquire the force of poisons in nature, or the nature of sin and vice in morality. But this part touching angels and spirits I cannot note as deficient, for many have occupied themselves in it; I may rather challenge it, in many of the writers thereof, as fabulous and fantastical.

VII. (1) Leaving therefore divine philosophy or natural theology (not divinity or inspired theology, which we reserve for the last of all as the haven and sabbath of all man's contemplations) we will now proceed to natural philosophy. If then it be true that Democritus said, "That the truth of nature lieth hid in certain deep mines and caves;" and if it be true likewise that the alchemists do so much inculcate, that Vulcan is a second nature, and imitateth that dexterously and compendiously, which nature worketh by ambages and length of time, it were good to divide natural philosophy into the mine and the furnace, and to make two professions or occupations of natural philosophers--some to be pioneers and some smiths; some to dig, and some to refine and hammer. And surely I do best allow of a division of that kind, though in more familiar and scholastical terms: namely, that these be the two parts of natural philosophy--the inquisition of causes, and the production of effects; speculative and operative; natural science, and natural prudence. For as in civil matters there is a wisdom of discourse, and a wisdom of direction; so is it in natural. And here I will make a request, that for the latter (or at least for a part thereof) I may revive and reintegrate the misapplied and abused name of natural magic, which in the true sense is but natural wisdom, or natural prudence;

taken according to the ancient acception, purged from vanity and superstition. Now although it be true, and I know it well, that there is an intercourse between causes and effects, so as both these knowledges, speculative and operative, have a great connection between themselves; yet because all true and fruitful natural philosophy hath a double scale or ladder, ascendent and descendent, ascending from experiments to the invention of causes, and descending from causes to the invention of new experiments; therefore I judge it most requisite that these two parts be severally considered and handled.

(2) Natural science or theory is divided into physic and metaphysic; wherein I desire it may be conceived that I use the word metaphysic in a differing sense from that that is received. And in like manner, I doubt not but it will easily appear to men of judgment, that in this and other particulars, wheresoever my conception and notion may differ from the ancient, yet I am studious to keep the ancient terms. For hoping well to deliver myself from mistaking, by the order and perspicuous expressing of that I do propound, I am otherwise zealous and affectionate to recede as little from antiquity, either in terms or opinions, as may stand with truth and the proficiencie of knowledge. And herein I cannot a little marvel at the philosopher Aristotle, that did proceed in such a spirit of difference and contradiction towards all antiquity; undertaking not only to frame new words of science at pleasure, but to confound and extinguish all ancient wisdom; insomuch as he never nameth or mentioneth an ancient author or opinion, but to confute and reprove; wherein for glory, and drawing followers and disciples, he took the right course. For certainly there cometh to pass, and hath place in human truth, that which was noted and pronounced in the highest truth:- Veni in nomine partis, nec recipitis me; si quis venerit in nomine suo eum recipietis. But in this divine aphorism (considering to whom it was applied, namely, to antichrist, the highest deceiver), we may discern well that the coming in a man's own name, without regard of antiquity or paternity, is no good sign of truth, although it be joined with the fortune and success of an eum recipietis. But for this excellent person Aristotle, I will think of him that he learned that humour of his scholar, with whom it seemeth he did emulate; the one to conquer all opinions, as the other to conquer all nations. Wherein, nevertheless, it may be, he may at some men's hands, that are of a bitter disposition, get a like title as his scholar did:-

"Felix terrarum praedo, non utile mundo
Editus exemplum, &c."

So,

"Felix doctrinae praedo."

But to me, on the other side, that do desire as much as lieth in my pen to ground a sociable intercourse between antiquity and proficiencie, it seemeth best to keep way with antiquity usque ad aras; and, therefore, to retain the ancient terms, though I sometimes alter the uses and definitions, according to the moderate

proceeding in civil government; where, although there be some alteration, yet that holdeth which Tacitus wisely noteth, eadem magistratum vocabula.

(3) To return, therefore, to the use and acception of the term metaphysic as I do now understand the word; it appeareth, by that which hath been already said, that I intend philosophia prima, summary philosophy and metaphysic, which heretofore have been confounded as one, to be two distinct things. For the one I have made as a parent or common ancestor to all knowledge; and the other I have now brought in as a branch or descendant of natural science. It appeareth likewise that I have assigned to summary philosophy the common principles and axioms which are promiscuous and indifferent to several sciences; I have assigned unto it likewise the inquiry touching the operation or the relative and adventive characters of essences, as quantity, similitude, diversity, possibility, and the rest, with this distinction and provision; that they be handled as they have efficacy in nature, and not logically. It appeareth likewise that natural theology, which heretofore hath been handled confusedly with metaphysic, I have enclosed and bounded by itself. It is therefore now a question what is left remaining for metaphysic; wherein I may without prejudice preserve thus much of the conceit of antiquity, that physic should contemplate that which is inherent in matter, and therefore transitory; and metaphysic that which is abstracted and fixed. And again, that physic should handle that which supposeth in nature only a being and moving; and metaphysic should handle that which supposeth further in nature a reason, understanding, and platform. But the difference, perspicuously expressed, is most familiar and sensible. For as we divided natural philosophy in general into the inquiry of causes and productions of effects, so that part which concerneth the inquiry of causes we do subdivide according to the received and sound division of causes. The one part, which is physic, inquireth and handleth the material and efficient causes; and the other, which is metaphysic, handleth the formal and final causes.

(4) Physic (taking it according to the derivation, and not according to our idiom for medicine) is situate in a middle term or distance between natural history and metaphysic. For natural history describeth the variety of things; physic the causes, but variable or respective causes; and metaphysic the fixed and constant causes.

"Limus ut hic durescit, et haec ut cera liquescit,
Uno eodemque igni."

Fire is the cause of induration, but respective to clay; fire is the cause of colliquation, but respective to wax. But fire is no constant cause either of induration or colliquation; so then the physical causes are but the efficient and the matter. Physic hath three parts, whereof two respect nature united or collected, the third contemplateth nature diffused or distributed. Nature is collected either into one entire total, or else into the same principles or seeds. So as the first doctrine is touching the contexture or configuration of things, as de mundo, de universitate rerum. The second is the doctrine concerning the principles or originals of things. The third is the doctrine concerning all variety and particularity of things; whether it be of the differing

substances, or their differing qualities and natures; whereof there needeth no enumeration, this part being but as a gloss or paraphrase that attendeth upon the text of natural history. Of these three I cannot report any as deficient. In what truth or perfection they are handled, I make not now any judgment; but they are parts of knowledge not deserted by the labour of man.

(5) For metaphysic, we have assigned unto it the inquiry of formal and final causes; which assignation, as to the former of them, may seem to be nugatory and void, because of the received and inveterate opinion, that the inquisition of man is not competent to find out essential forms or true differences; of which opinion we will take this hold, that the invention of forms is of all other parts of knowledge the worthiest to be sought, if it be possible to be found. As for the possibility, they are ill discoverers that think there is no land, when they can see nothing but sea. But it is manifest that Plato, in his opinion of ideas, as one that had a wit of elevation situate as upon a cliff, did descry that forms were the true object of knowledge; but lost the real fruit of his opinion, by considering of forms as absolutely abstracted from matter, and not confined and determined by matter; and so turning his opinion upon theology, wherewith all his natural philosophy is infected. But if any man shall keep a continual watchful and severe eye upon action, operation, and the use of knowledge, he may advise and take notice what are the forms, the disclosures whereof are fruitful and important to the state of man. For as to the forms of substances (man only except, of whom it is said, *Formavit hominem de limo terrae, et spiravit in faciem ejus spiraculum vitae*, and not as of all other creatures, *Producant aquae, producat terra*), the forms of substances I say (as they are now by compounding and transplanting multiplied) are so perplexed, as they are not to be inquired; no more than it were either possible or to purpose to seek in gross the forms of those sounds which make words, which by composition and transposition of letters are infinite. But, on the other side, to inquire the form of those sounds or voices which make simple letters is easily comprehensible; and being known induceth and manifesteth the forms of all words, which consist and are compounded of them. In the same manner to inquire the form of a lion, of an oak, of gold; nay, of water, of air, is a vain pursuit; but to inquire the forms of sense, of voluntary motion, of vegetation, of colours, of gravity and levity, of density, of tenuity, of heat, of cold, and all other natures and qualities, which, like an alphabet, are not many, and of which the essences (upheld by matter) of all creatures do consist; to inquire, I say, the true forms of these, is that part of metaphysic which we now define of. Not but that physic doth make inquiry and take consideration of the same natures; but how? Only as to the material and efficient causes of them, and not as to the forms. For example, if the cause of whiteness in snow or froth be inquired, and it be rendered thus, that the subtle intermixture of air and water is the cause, it is well rendered; but, nevertheless, is this the form of whiteness? No; but it is the efficient, which is ever but *vehiculum formae*. This part of metaphysic I do not find laboured and performed; whereat I marvel not; because I hold it not possible to be invented by that course of invention which hath been used; in regard that men (which is the root of all error) have made too untimely a departure, and too remote a recess from particulars.

(6) But the use of this part of metaphysic, which I report as deficient, is of the rest the most excellent in two respects: the

one, because it is the duty and virtue of all knowledge to abridge the infinity of individual experience, as much as the conception of truth will permit, and to remedy the complaint of *vita brevis, ars longa*; which is performed by uniting the notions and conceptions of sciences. For knowledges are as pyramids, whereof history is the basis. So of natural philosophy, the basis is natural history; the stage next the basis is physic; the stage next the vertical point is metaphysic. As for the vertical point, *opus quod operatur Deus a principio usque ad finem*, the summary law of nature, we know not whether man's inquiry can attain unto it. But these three be the true stages of knowledge, and are to them that are depraved no better than the giants' hills:-

"*Ter sunt conati imponere Pelio Ossam,
Scilicet atque Ossae frondsum involvere Olympum.*"

But to those which refer all things to the glory of God, they are as the three acclamations, *Sante, sancte, sancte!* holy in the description or dilatation of His works; holy in the connection or concatenation of them; and holy in the union of them in a perpetual and uniform law. And, therefore, the speculation was excellent in Parmenides and Plato, although but a speculation in them, that all things by scale did ascend to unity. So then always that knowledge is worthiest which is charged with least multiplicity, which appeareth to be metaphysic; as that which considereth the simple forms or differences of things, which are few in number, and the degrees and co-ordinations whereof make all this variety. The second respect, which valueth and commendeth this part of metaphysic, is that it doth enfranchise the power of man unto the greatest liberty and possibility of works and effects. For physic carrieth men in narrow and restrained ways, subject to many accidents and impediments, imitating the ordinary flexuous courses of nature. But *latae undique sunt sapientibus viae*; to sapience (which was anciently defined to be *rerum divinarum et humanarum scientia*) there is ever a choice of means. For physical causes give light to new invention in *simili materia*. But whosoever knoweth any form, knoweth the utmost possibility of superinducing that nature upon any variety of matter; and so is less restrained in operation, either to the basis of the matter, or the condition of the efficient; which kind of knowledge Solomon likewise, though in a more divine sense, elegantly describeth: *non arctabuntur gressus tui, et currens non habebis offendiculum*. The ways of sapience are not much liable either to particularity or chance.

(7) The second part of metaphysic is the inquiry of final causes, which I am moved to report not as omitted, but as misplaced. And yet if it were but a fault in order, I would not speak of it; for order is matter of illustration, but pertaineth not to the substance of sciences. But this misplacing hath caused a deficiency, or at least a great improficiency in the sciences themselves. For the handling of final causes, mixed with the rest in physical inquiries, hath intercepted the severe and diligent inquiry of all real and physical causes, and given men the occasion to stay upon these satisfactory and specious causes, to the great arrest and prejudice of further discovery. For this I find done not only by Plato, who ever anchoreth upon that shore, but by Aristotle, Galen, and others which do usually likewise fall upon these flats of discoursing

causes. For to say that "the hairs of the eyelids are for a quickset and fence about the sight;" or that "the firmness of the skins and hides of living creatures is to defend them from the extremities of heat or cold;" or that "the bones are for the columns or beams, whereupon the frames of the bodies of living creatures are built;" or that "the leaves of trees are for protecting of the fruit;" or that "the clouds are for watering of the earth;" or that "the solidness of the earth is for the station and mansion of living creatures;" and the like, is well inquired and collected in metaphysic, but in physic they are impertinent. Nay, they are, indeed, but remoras and hindrances to stay and slug the ship from further sailing; and have brought this to pass, that the search of the physical causes hath been neglected and passed in silence. And, therefore, the natural philosophy of Democritus and some others, who did not suppose a mind or reason in the frame of things, but attributed the form thereof able to maintain itself to infinite essays or proofs of Nature, which they term fortune, seemeth to me (as far as I can judge by the recital and fragments which remain unto us) in particularities of physical causes more real and better inquired than that of Aristotle and Plato; whereof both intermingled final causes, the one as a part of theology, and the other as a part of logic, which were the favourite studies respectively of both those persons; not because those final causes are not true and worthy to be inquired, being kept within their own province, but because their excursions into the limits of physical causes hath bred a vastness and solitude in that tract. For otherwise, keeping their precincts and borders, men are extremely deceived if they think there is an enmity or repugnancy at all between them. For the cause rendered, that "the hairs about the eyelids are for the safeguard of the sight," doth not impugn the cause rendered, that "pilosity is incident to orifices of moisture--*muscosi fontes*, &c." Nor the cause rendered, that "the firmness of hides is for the armour of the body against extremities of heat or cold," doth not impugn the cause rendered, that "contraction of pores is incident to the outwardest parts, in regard of their adjacence to foreign or unlike bodies;" and so of the rest, both causes being true and compatible, the one declaring an intention, the other a consequence only. Neither doth this call in question or derogate from Divine Providence, but highly confirm and exalt it. For as in civil actions he is the greater and deeper politique that can make other men the instruments of his will and ends, and yet never acquaint them with his purpose, so as they shall do it and yet not know what they do, than he that imparteth his meaning to those he employeth; so is the wisdom of God more admirable, when Nature intendeth one thing and Providence draweth forth another, than if He had communicated to particular creatures and motions the characters and impressions of His Providence. And thus much for metaphysic; the latter part whereof I allow as extant, but wish it confined to his proper place.

VIII. (1) Nevertheless, there remaineth yet another part of natural philosophy, which is commonly made a principal part, and holdeth rank with physic special and metaphysic, which is mathematic; but I think it more agreeable to the nature of things, and to the light of order, to place it as a branch of metaphysic. For the subject of it being quantity, not quantity indefinite, which is but a relative, and belongeth to *philosophia prima* (as hath been said), but quantity determined or proportionable, it appeareth to be one of the essential forms of things, as that that is causative in Nature of a

number of effects; insomuch as we see in the schools both of Democritus and of Pythagoras that the one did ascribe figure to the first seeds of things, and the other did suppose numbers to be the principles and originals of things. And it is true also that of all other forms (as we understand forms) it is the most abstracted and separable from matter, and therefore most proper to metaphysic; which hath likewise been the cause why it hath been better laboured and inquired than any of the other forms, which are more immersed in matter. For it being the nature of the mind of man (to the extreme prejudice of knowledge) to delight in the spacious liberty of generalities, as in a champaign region, and not in the inclosures of particularity, the mathematics of all other knowledge were the goodliest fields to satisfy that appetite. But for the placing of this science, it is not much material: only we have endeavoured in these our partitions to observe a kind of perspective, that one part may cast light upon another.

(2) The mathematics are either pure or mixed. To the pure mathematics are those sciences belonging which handle quantity determinate, merely severed from any axioms of natural philosophy; and these are two, geometry and arithmetic, the one handling quantity continued, and the other dissevered. Mixed hath for subject some axioms or parts of natural philosophy, and considereth quantity determined, as it is auxiliary and incident unto them. For many parts of Nature can neither be invented with sufficient subtlety, nor demonstrated with sufficient perspicuity, nor accommodated unto use with sufficient dexterity, without the aid and intervening of the mathematics, of which sort are perspective, music, astronomy, cosmography, architecture, engineery, and divers others. In the mathematics I can report no deficiency, except it be that men do not sufficiently understand this excellent use of the pure mathematics, in that they do remedy and cure many defects in the wit and faculties intellectual. For if the wit be too dull, they sharpen it; if too wandering, they fix it; if too inherent in the sense, they abstract it. So that as tennis is a game of no use in itself, but of great use in respect it maketh a quick eye and a body ready to put itself into all postures, so in the mathematics that use which is collateral and intervenient is no less worthy than that which is principal and intended. And as for the mixed mathematics, I may only make this prediction, that there cannot fail to be more kinds of them as Nature grows further disclosed. Thus much of natural science, or the part of Nature speculative.

(3) For natural prudence, or the part operative of natural philosophy, we will divide it into three parts--experimental, philosophical, and magical; which three parts active have a correspondence and analogy with the three parts speculative, natural history, phisic, and metaphysic. For many operations have been invented, sometimes by a casual incidence and occurrence, sometimes by a purposed experiment; and of those which have been found by an intentional experiment, some have been found out by varying or extending the same experiment, some by transferring and compounding divers experiments the one into the other, which kind of invention an empiric may manage. Again, by the knowledge of physical causes there cannot fail to follow many indications and designations of new particulars, if men in their speculation will keep one eye upon use and practice. But these are but coastings along the shore, *premedo littus iniquum*; for it seemeth to me there can hardly be discovered any radical or fundamental alterations and innovations in Nature,

either by the fortune and essays of experiments, or by the light and direction of physical causes. If, therefore, we have reported metaphysic deficient, it must follow that we do the like of natural magic, which hath relation thereunto. For as for the natural magic whereof now there is mention in books, containing certain credulous and superstitious conceits and observations of sympathies and antipathies, and hidden proprieties, and some frivolous experiments, strange rather by disguisement than in themselves, it is as far differing in truth of Nature from such a knowledge as we require as the story of King Arthur of Britain, or Hugh of Bourdeaux, differs from Caesar's Commentaries in truth of story; for it is manifest that Caesar did greater things de vero than those imaginary heroes were feigned to do. But he did them not in that fabulous manner. Of this kind of learning the fable of Ixion was a figure, who designed to enjoy Juno, the goddess of power, and instead of her had copulation with a cloud, of which mixture were begotten centaurs and chimeras. So whosoever shall entertain high and vaporous imaginations, instead of a laborious and sober inquiry of truth, shall beget hopes and beliefs of strange and impossible shapes. And, therefore, we may note in these sciences which hold so much of imagination and belief, as this degenerate natural magic, alchemy, astrology, and the like, that in their propositions the description of the means is ever more monstrous than the pretence or end. For it is a thing more probable that he that knoweth well the natures of weight, of colour, of pliant and fragile in respect of the hammer, of volatile and fixed in respect of the fire, and the rest, may superinduce upon some metal the nature and form of gold by such mechanic as longeth to the production of the natures afore rehearsed, than that some grains of the medicine projected should in a few moments of time turn a sea of quicksilver or other material into gold. So it is more probable that he that knoweth the nature

of arefaction, the nature of assimilation of nourishment to the thing nourished, the manner of increase and clearing of spirits, the manner of the depredations which spirits make upon the humours and solid parts, shall by ambages of diets, bathings, anointings, medicines, motions, and the like, prolong life, or restore some degree of youth or vivacity, than that it can be done with the use of a few drops or scruples of a liquor or receipt. To conclude, therefore, the true natural magic, which is that great liberty and latitude of operation which dependeth upon the knowledge of forms, I may report deficient, as the relative thereof is. To which part, if we be serious and incline not to vanities and plausible discourse, besides the deriving and deducing the operations themselves from metaphysic, there are pertinent two points of much purpose, the one by way of preparation, the other by way of caution. The first is, that there be made a calendar, resembling an inventory of the estate of man, containing all the inventions (being the works or fruits of Nature or art) which are now extant, and whereof man is already possessed; out of which doth naturally result a note what things are yet held impossible, or not invented, which calendar will be the more artificial and serviceable if to every reputed impossibility you add what thing is extant which cometh the nearest in degree to that impossibility; to the end that by these optatives and potentials man's inquiry may be the more awake in deducing direction of works from the speculation of causes. And secondly, that these experiments be not only esteemed which have an immediate and present use, but those principally which are of most universal consequence for invention of other experiments, and those which give most light

to the invention of causes; for the invention of the mariner's needle, which giveth the direction, is of no less benefit for navigation than the invention of the sails which give the motion.

(4) Thus have I passed through natural philosophy and the deficiencies thereof; wherein if I have differed from the ancient and received doctrines, and thereby shall move contradiction, for my part, as I affect not to dissent, so I purpose not to contend. If it be truth,

"Non canimus surdis, respondent omnia sylvae,"

the voice of Nature will consent, whether the voice of man do or no. And as Alexander Borgia was wont to say of the expedition of the French for Naples, that they came with chalk in their hands to mark up their lodgings, and not with weapons to fight; so I like better that entry of truth which cometh peaceably with chalk to mark up those minds which are capable to lodge and harbour it, than that which cometh with pugnacity and contention.

(5) But there remaineth a division of natural philosophy according to the report of the inquiry, and nothing concerning the matter or subject: and that is positive and considerative, when the inquiry reporteth either an assertion or a doubt. These doubts or non liquets are of two sorts, particular and total. For the first, we see a good example thereof in Aristotle's Problems which deserved to have had a better continuance; but so nevertheless as there is one point whereof warning is to be given and taken. The registering of doubts hath two excellent uses: the one, that it saveth philosophy from errors and falsehoods; when that which is not fully appearing is not collected into assertion, whereby error might draw error, but reserved in doubt; the other, that the entry of doubts are as so many suckers or sponges to draw use of knowledge; insomuch as that which if doubts had not preceded, a man should never have advised, but passed it over without note, by the suggestion and solicitation of doubts is made to be attended and applied. But both these commodities do scarcely countervail and inconvenience, which will intrude itself if it be not debarred; which is, that when a doubt is once received, men labour rather how to keep it a doubt still, than how to solve it, and accordingly bend their wits. Of this we see the familiar example in lawyers and scholars, both which, if they have once admitted a doubt, it goeth ever after authorised for a doubt. But that use of wit and knowledge is to be allowed, which laboureth to make doubtful things certain, and not those which labour to make certain things doubtful. Therefore these calendars of doubts I commend as excellent things; so that there he this caution used, that when they be thoroughly sifted and brought to resolution, they be from thenceforth omitted, discarded, and not continued to cherish and encourage men in doubting. To which calendar of doubts or problems I advise be annexed another calendar, as much or more material which is a calendar of popular errors: I mean chiefly in natural history, such as pass in speech and conceit, and are nevertheless apparently detected and convicted of untruth, that man's knowledge be not weakened nor embased by such dross and vanity. As for the doubts or non liquets general or in total, I understand those differences of opinions touching the principles of nature, and the fundamental points of the same, which have caused

the diversity of sects, schools, and philosophies, as that of Empedocles, Pythagoras, Democritus, Parmenides, and the rest. For although Aristotle, as though he had been of the race of the Ottomans, thought he could not reign except the first thing he did he killed all his brethren; yet to those that seek truth and not magistrality, it cannot but seem a matter of great profit, to see before them the several opinions touching the foundations of nature. Not for any exact truth that can be expected in those theories; for as the same phenomena in astronomy are satisfied by this received astronomy of the diurnal motion, and the proper motions of the planets, with their eccentrics and epicycles, and likewise by the theory of Copernicus, who supposed the earth to move, and the calculations are indifferently agreeable to both, so the ordinary face and view of experience is many times satisfied by several theories and philosophies; whereas to find the real truth requireth another manner of severity and attention. For as Aristotle saith, that children at the first will call every woman mother, but afterward they come to distinguish according to truth, so experience, if it be in childhood, will call every philosophy mother, but when it cometh to ripeness it will discern the true mother. So as in the meantime it is good to see the several glosses and opinions upon Nature, whereof it may be everyone in some one point hath seen clearer than his fellows, therefore I wish some collection to be made painfully and understandingly de antiquis philosophiis, out of all the possible light which remaineth to us of them: which kind of work I find deficient. But here I must give warning, that it be done distinctly and severedly; the philosophies of everyone throughout by themselves, and not by titles packed and faggoted up together, as hath been done by Plutarch. For it is the harmony of a philosophy in itself, which giveth it light and credence; whereas if it be singled and broken, it will seem more foreign and dissonant. For as when I read in Tacitus the actions of Nero or Claudius, with circumstances of times, inducements, and occasions, I find them not so strange; but when I read them in Suetonius Tranquillus, gathered into titles and bundles and not in order of time, they seem more monstrous and incredible: so is it of any philosophy reported entire, and dismembered by articles. Neither do I exclude opinions of latter times to be likewise represented in this calendar of sects of philosophy, as that of Theophrastus Paracelsus, eloquently reduced into an harmony by the pen of Severinus the Dane; and that of Tilesius, and his scholar Donius, being as a pastoral philosophy, full of sense, but of no great depth; and that of Fracastorius, who, though he pretended not to make any new philosophy, yet did use the absoluteness of his own sense upon the old; and that of Gilbertus our countryman, who revived, with some alterations and demonstrations, the opinions of Xenophanes; and any other worthy to be admitted.

(6) Thus have we now dealt with two of the three beams of man's knowledge; that is radius directus, which is referred to nature, radius refractus, which is referred to God, and cannot report truly because of the inequality of the medium. There resteth radius reflexus, whereby man beholdeth and contemplateth himself.

IX. (1) We come therefore now to that knowledge whereunto the ancient oracle directeth us, which is the knowledge of ourselves; which deserveth the more accurate handling, by how much it toucheth us more nearly. This knowledge, as it is the end and term of natural philosophy in the intention of man, so notwithstanding it is

but a portion of natural philosophy in the continent of Nature. And generally let this be a rule, that all partitions of knowledges be accepted rather for lines and veins than for sections and separations; and that the continuance and entireness of knowledge be preserved. For the contrary hereof hath made particular sciences to become barren, shallow, and erroneous, while they have not been nourished and maintained from the common fountain. So we see Cicero, the orator, complained of Socrates and his school, that he was the first that separated philosophy and rhetoric; whereupon rhetoric became an empty and verbal art. So we may see that the opinion of Copernicus, touching the rotation of the earth, which astronomy itself cannot correct, because it is not repugnant to any of the phenomena, yet natural philosophy may correct. So we see also that the science of medicine if it be destituted and forsaken by natural philosophy, it is not much better than an empirical practice. With this reservation, therefore, we proceed to human philosophy or humanity, which hath two parts: the one considereth man segregate or distributively, the other congregate or in society; so as human philosophy is either simple and particular, or conjugate and civil. Humanity particular consisteth of the same parts whereof man consisteth: that is, of knowledges which respect the body, and of knowledges that respect the mind. But before we distribute so far, it is good to constitute. For I do take the consideration in general, and at large, of human nature to be fit to be emancipated and made a knowledge by itself, not so much in regard of those delightful and elegant discourses which have been made of the dignity of man, of his miseries, of his state and life, and the like adjuncts of his common and undivided nature; but chiefly in regard of the knowledge concerning the sympathies and concordances between the mind and body, which being mixed cannot be properly assigned to the sciences of either.

(2) This knowledge hath two branches: for as all leagues and amities consist of mutual intelligence and mutual offices, so this league of mind and body hath these two parts: how the one discloseth the other, and how the one worketh upon the other; discovery and impression. The former of these hath begotten two arts, both of prediction or prenotion; whereof the one is honoured with the inquiry of Aristotle, and the other of Hippocrates. And although they have of later time been used to be coupled with superstitions and fantastical arts, yet being purged and restored to their true state, they have both of them a solid ground in Nature, and a profitable use in life. The first is physiognomy, which discovereth the disposition of the mind by the lineaments of the body. The second is the exposition of natural dreams, which discovereth the state of the body by the imaginations of the mind. In the former of these I note a deficiency. For Aristotle hath very ingeniously and diligently handled the factures of the body, but not the gestures of the body, which are no less comprehensible by art, and of greater use and advantage. For the lineaments of the body do disclose the disposition and inclination of the mind in general; but the motions of the countenance and parts do not only so, but do further disclose the present humour and state of the mind and will. For as your majesty saith most aptly and elegantly, "As the tongue speaketh to the ear so the gesture speaketh to the eye." And, therefore, a number of subtle persons, whose eyes do dwell upon the faces and fashions of men, do well know the advantage of this observation, as being most part of their ability; neither can it be denied, but that it is a great discovery of dissimulations, and a

great direction in business.

(3) The latter branch, touching impression, hath not been collected into art, but hath been handled dispersedly; and it hath the same relation or antistrophe that the former hath. For the consideration is double--either how and how far the humours and affects of the body do alter or work upon the mind, or, again, how and how far the passions or apprehensions of the mind do alter or work upon the body. The former of these hath been inquired and considered as a part and appendix of medicine, but much more as a part of religion or superstition. For the physician prescribeth cures of the mind in frenzies and melancholy passions, and pretendeth also to exhibit medicines to exhilarate the mind, to control the courage, to clarify the wits, to corroborate the memory, and the like; but the scruples and superstitions of diet and other regiment of the body in the sect of the Pythagoreans, in the heresy of the Manichees, and in the law of Mahomet, do exceed. So likewise the ordinances in the ceremonial law, interdicting the eating of the blood and the fat, distinguishing between beasts clean and unclean for meat, are many and strict; nay, the faith itself being clear and serene from all clouds of ceremony, yet retaineth the use of fastlings, abstinences, and other macerations and humiliations of the body, as things real, and not figurative. The root and life of all which prescripts is (besides the ceremony) the consideration of that dependency which the affections of the mind are submitted unto upon the state and disposition of the body. And if any man of weak judgment do conceive that this suffering of the mind from the body doth either question the immortality, or derogate from the sovereignty of the soul, he may be taught, in easy instances, that the infant in the mother's womb is compatible with the mother, and yet separable; and the most absolute monarch is sometimes led by his servants, and yet without subjection. As for the reciprocal knowledge, which is the operation of the conceits and passions of the mind upon the body, we see all wise physicians, in the prescriptions of their regiments to their patients, do ever consider *accidentia animi*, as of great force to further or hinder remedies or recoveries: and more specially it is an inquiry of great depth and worth concerning imagination, how and how far it altereth the body proper of the imaginant; for although it hath a manifest power to hurt, it followeth not it hath the same degree of power to help. No more than a man can conclude, that because there be pestilent airs, able suddenly to kill a man in health, therefore there should be sovereign airs, able suddenly to cure a man in sickness. But the inquisition of this part is of great use, though it needeth, as Socrates said, "a Delian diver," being difficult and profound. But unto all this knowledge *de communi vinculo*, of the concordances between the mind and the body, that part of inquiry is most necessary which considereth of the seats and domiciles which the several faculties of the mind do take and occupate in the organs of the body; which knowledge hath been attempted, and is controverted, and deserveth to be much better inquired. For the opinion of Plato, who placed the understanding in the brain, animosity (which he did unfitly call anger, having a greater mixture with pride) in the heart, and concupiscence or sensuality in the liver, deserveth not to be despised, but much less to be allowed. So, then, we have constituted (as in our own wish and advice) the inquiry touching human nature entire, as a just portion of knowledge to be handled apart.

X. (1) The knowledge that concerneth man's body is divided as the

good of man's body is divided, unto which it referreth. The good of man's body is of four kinds--health, beauty, strength, and pleasure: so the knowledges are medicine, or art of cure; art of decoration, which is called cosmetic; art of activity, which is called athletic; and art voluptuary, which Tacitus truly calleth eruditus luxus. This subject of man's body is, of all other things in nature, most susceptible of remedy; but then that remedy is most susceptible of error; for the same subtlety of the subject doth cause large possibility and easy failing, and therefore the inquiry ought to be the more exact.

(2) To speak, therefore, of medicine, and to resume that we have said, ascending a little higher: the ancient opinion that man was microcosmus--an abstract or model of the world--hath been fantastically strained by Paracelsus and the alchemists, as if there were to be found in man's body certain correspondences and parallels, which should have respect to all varieties of things, as stars, planets, minerals, which are extant in the great world. But thus much is evidently true, that of all substances which nature hath produced, man's body is the most extremely compounded. For we see herbs and plants are nourished by earth and water; beasts for the most part by herbs and fruits; man by the flesh of beasts, birds, fishes, herbs, grains, fruits, water, and the manifold alterations, dressings, and preparations of these several bodies before they come to be his food and aliment. Add hereunto that beasts have a more simple order of life, and less change of affections to work upon their bodies, whereas man in his mansion, sleep, exercise, passions, hath infinite variations: and it cannot be denied but that the body of man of all other things is of the most compounded mass. The soul, on the other side, is the simplest of substances, as is well expressed:

"Purumque reliquit
AEthereum sensum atque aurai simplicis ignem."

So that it is no marvel though the soul so placed enjoy no rest, if that principle be true, that *Motus rerum est rapidus extra locum, placidus in loco*. But to the purpose. This variable composition of man's body hath made it as an instrument easy to distemper; and, therefore, the poets did well to conjoin music and medicine in Apollo, because the office of medicine is but to tune this curious harp of man's body and to reduce it to harmony. So, then, the subject being so variable hath made the art by consequent more conjectural; and the art being conjectural hath made so much the more place to be left for imposture. For almost all other arts and sciences are judged by acts or masterpieces, as I may term them, and not by the successes and events. The lawyer is judged by the virtue of his pleading, and not by the issue of the cause; this master in this ship is judged by the directing his course aright, and not by the fortune of the voyage; but the physician, and perhaps this politique, hath no particular acts demonstrative of his ability, but is judged most by the event, which is ever but as it is taken: for who can tell, if a patient die or recover, or if a state be preserved or ruined, whether it be art or accident? And therefore many times the impostor is prized, and the man of virtue taxed. Nay, we see [the] weakness and credulity of men is such, as they will often refer a mountebank or witch before a learned physician.

And therefore the poets were clear-sighted in discerning this extreme folly when they made AEsculapius and Circe, brother and sister, both children of the sun, as in the verses -

"Ipse repertorem medicinae talis et artis
Fulmine Phoebigenam Stygias detrusit ad undas."

And again -

"Dives inaccessos ubi Solis filia lucos," &c.

For in all times, in the opinion of the multitude, witches and old women and impostors, have had a competition with physicians. And what followeth? Even this, that physicians say to themselves, as Solomon expresseth it upon a higher occasion, "If it befall to me as befalleth to the fools, why should I labour to be more wise?" And therefore I cannot much blame physicians that they use commonly to intend some other art or practice, which they fancy more than their profession; for you shall have of them antiquaries, poets, humanists, statesmen, merchants, divines, and in every of these better seen than in their profession; and no doubt upon this ground that they find that mediocrity and excellency in their art maketh no difference in profit or reputation towards their fortune: for the weakness of patients, and sweetness of life, and nature of hope, maketh men depend upon physicians with all their defects. But, nevertheless, these things which we have spoken of are courses begotten between a little occasion and a great deal of sloth and default; for if we will excite and awake our observation, we shall see in familiar instances what a predominant faculty the subtlety of spirit hath over the variety of matter or form. Nothing more variable than faces and countenances, yet men can bear in memory the infinite distinctions of them; nay, a painter, with a few shells of colours, and the benefit of his eye, and habit of his imagination, can imitate them all that ever have been, are, or may be, if they were brought before him. Nothing more variable than voices, yet men can likewise discern them personally: nay, you shall have a buffon or pantomimus will express as many as he pleaseth. Nothing more variable than the differing sounds of words; yet men have found the way to reduce them to a few simple letters. So that it is not the insufficiency or incapacity of man's mind, but it is the remote standing or placing thereof that breedeth these mazes and incomprehensions; for as the sense afar off is full of mistaking, but is exact at hand, so is it of the understanding, the remedy whereof is, not to quicken or strengthen the organ, but to go nearer to the object; and therefore there is no doubt but if the physicians will learn and use the true approaches and avenues of nature, they may assume as much as the poet saith:

"Et quoniam variant morbi, variabimus artes;
Mille mali species, mille salutis erunt."

Which that they should do, the nobleness of their art doth deserve: well shadowed by the poets, in that they made AEsculapius to be the

son of [the] sun, the one being the fountain of life, the other as the second-stream; but infinitely more honoured by the example of our Saviour, who made the body of man the object of His miracles, as the soul was the object of His doctrine. For we read not that ever He vouchsafed to do any miracle about honour or money (except that one for giving tribute to Caesar), but only about the preserving, sustaining, and healing the body of man.

(3) Medicine is a science which hath been (as we have said) more professed than laboured, and yet more laboured than advanced; the labour having been, in my judgment, rather in circle than in progression. For I find much iteration, but small addition. It considereth causes of diseases, with the occasions or impulsions; the diseases themselves, with the accidents; and the cures, with the preservations. The deficiencies which I think good to note, being a few of many, and those such as are of a more open and manifest nature, I will enumerate and not place.

(4) The first is the discontinuance of the ancient and serious diligence of Hippocrates, which used to set down a narrative of the special cases of his patients, and how they proceeded, and how they were judged by recovery or death. Therefore having an example proper in the father of the art, I shall not need to allege an example foreign, of the wisdom of the lawyers, who are careful to report new cases and decisions, for the direction of future judgments. This continuance of medicinal history I find deficient; which I understand neither to be so infinite as to extend to every common case, nor so reserved as to admit none but wonders: for many

things are new in this manner, which are not new in the kind; and if men will intend to observe, they shall find much worthy to observe.

(5) In the inquiry which is made by anatomy, I find much deficiency: for they inquire of the parts, and their substances, figures, and collocations; but they inquire not of the diversities of the parts, the secrecies of the passages, and the seats or nestling of the humours, nor much of the footsteps and impressions of diseases. The reason of which omission I suppose to be, because the first inquiry may be satisfied in the view of one or a few anatomies; but the latter, being comparative and casual, must arise from the view of many. And as to the diversity of parts, there is no doubt but the facture or framing of the inward parts is as full of difference as the outward, and in that is the cause continent of many diseases; which not being observed, they quarrel many times with the humours, which are not in fault; the fault being in the very frame and mechanic of the part, which cannot be removed by medicine alterative, but must be accommodated and palliated by diets and medicines familiar. And for the passages and pores, it is true which was anciently noted, that the more subtle of them appear not in anatomies, because they are shut and latent in dead bodies, though they be open and manifest in life: which being supposed, though the inhumanity of anatomia vivorum was by Celsus justly reproved; yet in regard of the great use of this observation, the inquiry needed not by him so slightly to have been relinquished altogether, or referred to the casual practices of surgery; but might have been well diverted upon the dissection of beasts alive, which notwithstanding the dissimilitude of their parts may sufficiently satisfy this inquiry. And for the humours, they are commonly passed over in anatomies as purgaments; whereas it is most

necessary to observe, what cavities, nests, and receptacles the humours do find in the parts, with the differing kind of the humour so lodged and received. And as for the footsteps of diseases, and their devastations of the inward parts, impostumations, exulcerations, discontinuations, putrefactions, consumptions, contractions, extensions, convulsions, dislocations, obstructions, repletions, together with all preternatural substances, as stones, carnosities, excrescences, worms, and the like; they ought to have been exactly observed by multitude of anatomies, and the contribution of men's several experiences, and carefully set down both historically according to the appearances, and artificially with a reference to the diseases and symptoms which resulted from them, in case where the anatomy is of a defunct patient; whereas now upon opening of bodies they are passed over slightly and in silence.

(6) In the inquiry of diseases, they do abandon the cures of many, some as in their nature incurable, and others as past the period of cure; so that Sylla and the Triumvirs never proscribed so many men to die, as they do by their ignorant edicts: whereof numbers do escape with less difficulty than they did in the Roman prescriptions. Therefore I will not doubt to note as a deficiency, that they inquire not the perfect cures of many diseases, or extremities of diseases; but pronouncing them incurable do enact a law of neglect, and exempt ignorance from discredit.

(7) Nay further, I esteem it the office of a physician not only to restore health, but to mitigate pain and dolours; and not only when such mitigation may conduce to recovery, but when it may serve to make a fair and easy passage. For it is no small felicity which Augustus Caesar was wont to wish to himself, that same Euthanasia; and which was specially noted in the death of Antoninus Pius, whose death was after the fashion, and semblance of a kindly and pleasant sheep. So it is written of Epicurus, that after his disease was judged desperate, he drowned his stomach and senses with a large draught and ingurgitation of wine; whereupon the epigram was made, *Hinc Stygias ebrius hausit aquas*; he was not sober enough to taste any bitterness of the Stygian water. But the physicians contrariwise do make a kind of scruple and religion to stay with the patient after the disease is deplored; whereas in my judgment they ought both to inquire the skill, and to give the attendances, for the facilitating and assuaging of the pains and agonies of death.

(5) In the consideration of the cures of diseases, I find a deficiency in the receipts of propriety, respecting the particular cures of diseases: for the physicians have frustrated the fruit of tradition and experience by their magistralities, in adding and taking out and changing quid pro qua in their receipts, at their pleasures; commanding so over the medicine, as the medicine cannot command over the disease. For except it be treacle and mithridatum, and of late diascordium, and a few more, they tie themselves to no receipts severely and religiously. For as to the confections of sale which are in the shops, they are for readiness and not for propriety. For they are upon general intentions of purging, opening, comforting, altering, and not much appropriate to particular diseases. And this is the cause why empirics and old women are more happy many times in their cures than learned physicians, because they are more religious in holding their medicines. Therefore here is the deficiency which I find, that physicians have not, partly out of their own practice, partly out of

the constant probations reported in books, and partly out of the traditions of empirics, set down and delivered over certain experimental medicines for the cure of particular diseases, besides their own conjectural and magistral descriptions. For as they were the men of the best composition in the state of Rome, which either being consuls inclined to the people, or being tribunes inclined to the senate; so in the matter we now handle, they be the best physicians, which being learned incline to the traditions of experience, or being empirics incline to the methods of learning.

(9) In preparation of medicines I do find strange, specially considering how mineral medicines have been extolled, and that they are safer for the outward than inward parts, that no man hath sought to make an imitation by art of natural baths and medicinable fountains: which nevertheless are confessed to receive their virtues from minerals; and not so only, but discerned and distinguished from what particular mineral they receive tincture, as sulphur, vitriol, steel, or the like; which nature, if it may be reduced to compositions of art, both the variety of them will be increased, and the temper of them will be more commanded.

(10) But lest I grow to be more particular than is agreeable either to my intention or to proportion, I will conclude this part with the note of one deficiency more, which seemeth to me of greatest consequence: which is, that the prescripts in use are too compendious to attain their end; for, to my understanding, it is a vain and flattering opinion to think any medicine can be so sovereign or so happy, as that the receipt or miss of it can work any great effect upon the body of man. It were a strange speech which spoken, or spoken oft, should reclaim a man from a vice to which he were by nature subject. It is order, pursuit, sequence, and interchange of application, which is mighty in nature; which although it require more exact knowledge in prescribing, and more precise obedience in observing, yet is recompensed with the magnitude of effects. And although a man would think, by the daily visitations of the physicians, that there were a pursuance in the cure, yet let a man look into their prescripts and ministrations, and he shall find them but inconstancies and every day's devices, without any settled providence or project. Not that every scrupulous or superstitious prescript is effectual, no more than every straight way is the way to heaven; but the truth of the direction must precede severity of observance.

(11) For cosmetic, it hath parts civil, and parts effeminate: for cleanness of body was ever esteemed to proceed from a due reverence to God, to society, and to ourselves. As for artificial decoration, it is well worthy of the deficiencies which it hath; being neither fine enough to deceive, nor handsome to use, nor wholesome to please.

(12) For athletic, I take the subject of it largely, that is to say, for any point of ability whereunto the body of man may be brought, whether it be of activity, or of patience; whereof activity hath two parts, strength and swiftness; and patience likewise hath two parts, hardness against wants and extremities, and endurance of pain or torment; whereof we see the practices in tumblers, in savages, and in those that suffer punishment. Nay, if there be any other faculty which falls not within any of the former divisions, as in those that dive, that obtain a strange power of containing respiration, and the

like, I refer it to this part. Of these things the practices are known, but the philosophy that concerneth them is not much inquired; the rather, I think, because they are supposed to be obtained, either by an aptness of nature, which cannot be taught, or only by continual custom, which is soon prescribed which though it be not true, yet I forbear to note any deficiencies; for the Olympian games are down long since, and the mediocrity of these things is for use; as for the excellency of them it serveth for the most part but for mercenary ostentation.

(13) For arts of pleasure sensual, the chief deficiency in them is of laws to repress them. For as it hath been well observed, that the arts which flourish in times while virtue is in growth, are military; and while virtue is in state, are liberal; and while virtue is in declination, are voluptuary: so I doubt that this age of the world is somewhat upon the descent of the wheel. With arts voluptuary I couple practices jocular; for the deceiving of the senses is one of the pleasures of the senses. As for games of recreation, I hold them to belong to civil life and education. And thus much of that particular human philosophy which concerns the body, which is but the tabernacle of the mind.

XI. (1) For human knowledge which concerns the mind, it hath two parts; the one that inquireth of the substance or nature of the soul or mind, the other that inquireth of the faculties or functions thereof. Unto the first of these, the considerations of the original of the soul, whether it be native or adventive, and how far it is exempted from laws of matter, and of the immortality thereof, and many other points, do appertain: which have been not more laboriously inquired than variously reported; so as the travail therein taken seemeth to have been rather in a maze than in a way. But although I am of opinion that this knowledge may be more really and soundly inquired, even in nature, than it hath been, yet I hold that in the end it must be hounded by religion, or else it will be subject to deceit and delusion. For as the substance of the soul in the creation was not extracted out of the mass of heaven and earth by the benediction of a procreat, but was immediately inspired from God, so it is not possible that it should be (otherwise than by accident) subject to the laws of heaven and earth, which are the subject of philosophy; and therefore the true knowledge of the nature and state of the soul must come by the same inspiration that gave the substance. Unto this part of knowledge touching the soul there be two appendices; which, as they have been handled, have rather vapoured forth fables than kindled truth: divination and fascination.

(2) Divination hath been anciently and fitly divided into artificial and natural: whereof artificial is, when the mind maketh a prediction by argument, concluding upon signs and tokens; natural is, when the mind hath a presentation by an internal power, without the inducement of a sign. Artificial is of two sorts: either when the argument is coupled with a derivation of causes, which is rational; or when it is only grounded upon a coincidence of the effect, which is experimental: whereof the latter for the most part is superstitious, such as were the heathen observations upon the inspection of sacrifices, the flights of birds, the swarming of bees; and such as was the Chaldean astrology, and the like. For artificial divination, the several kinds thereof are distributed amongst particular knowledges. The astronomer hath his predictions,

as of conjunctions, aspects, eclipses, and the like. The physician hath his predictions, of death, of recovery, of the accidents and issues of diseases. The politique hath his predictions; *O urbem venalem, et cito perituram, si emptorem invenerit!* which stayed not long to be performed, in Sylla first, and after in Caesar: so as these predictions are now impertinent, and to be referred over. But the divination which springeth from the internal nature of the soul is that which we now speak of; which hath been made to be of two sorts, primitive and by influxion. Primitive is grounded upon the supposition that the mind, when it is withdrawn and collected into itself, and not diffused into the organs of the body, hath some extent and latitude of prenotion; which therefore appeareth most in sleep, in ecstasies, and near death, and more rarely in waking apprehensions; and is induced and furthered by those abstinences and observances which make the mind most to consist in itself. By influxion, is grounded upon the conceit that the mind, as a mirror or glass, should take illumination from the foreknowledge of God and spirits: unto which the same regiment doth likewise conduce. For the retiring of the mind within itself is the state which is most susceptible of divine influxions; save that it is accompanied in this case with a fervency and elevation (which the ancients noted by fury), and not with a repose and quiet, as it is in the other.

(3) Fascination is the power and act of imagination intensive upon other bodies than the body of the imaginant, for of that we spake in the proper place. Wherein the school of Paracelsus, and the disciples of pretended natural magic, have been so intemperate, as they have exalted the power of the imagination to be much one with the power of miracle-working faith. Others, that draw nearer to probability, calling to their view the secret passages of things, and specially of the contagion that passeth from body to body, do conceive it should likewise be agreeable to nature that there should be some transmissions and operations from spirit to spirit without the mediation of the senses; whence the conceits have grown (now almost made civil) of the mastering spirit, and the force of confidence, and the like. Incident unto this is the inquiry how to raise and fortify the imagination; for if the imagination fortified have power, then it is material to know how to fortify and exalt it. And herein comes in crookedly and dangerously a palliation of a great part of ceremonial magic. For it may be pretended that ceremonies, characters, and charms do work, not by any tacit or sacramental contract with evil spirits, but serve only to strengthen the imagination of him that useth it; as images are said by the Roman Church to fix the cogitations and raise the devotions of them that pray before them. But for mine own judgment, if it be admitted that imagination hath power, and that ceremonies fortify imagination, and that they be used sincerely and intentionally for that purpose; yet I should hold them unlawful, as opposing to that first edict which God gave unto man, *In sudore vultus comedes panem tuum*. For they propound those noble effects, which God hath set forth unto man to be bought at the price of labour, to be attained by a few easy and slothful observances. Deficiencies in these knowledges I will report none, other than the general deficiency, that it is not known how much of them is verity, and how much vanity.

XII. (1) The knowledge which respecteth the faculties of the mind of man is of two kinds--the one respecting his understanding and reason, and the other his will, appetite, and affection; whereof the

former produceth position or decree, the latter action or execution. It is true that the imagination is an agent or nuncius in both provinces, both the judicial and the ministerial. For sense sendeth over to imagination before reason have judged, and reason sendeth over to imagination before the decree can be acted. For imagination ever precedeth voluntary motion. Saving that this Janus of imagination hath differing faces: for the face towards reason hath the print of truth, but the face towards action hath the print of good; which nevertheless are faces,

"Quales decet esse sororum."

Neither is the imagination simply and only a messenger; but is invested with, or at least wise usurpeth no small authority in itself, besides the duty of the message. For it was well said by Aristotle, "That the mind hath over the body that commandment, which the lord hath over a bondman; but that reason hath over the imagination that commandment which a magistrate hath over a free citizen," who may come also to rule in his turn. For we see that, in matters of faith and religion, we raise our imagination above our reason, which is the cause why religion sought ever access to the mind by similitudes, types, parables, visions, dreams. And again, in all persuasions that are wrought by eloquence, and other impressions of like nature, which do paint and disguise the true appearance of things, the chief recommendation unto reason is from the imagination. Nevertheless, because I find not any science that doth properly or fitly pertain to the imagination, I see no cause to alter the former division. For as for poesy, it is rather a pleasure or play of imagination than a work or duty thereof. And if it be a work, we speak not now of such parts of learning as the imagination produceth, but of such sciences as handle and consider of the imagination. No more than we shall speak now of such knowledges as reason produceth (for that extendeth to all philosophy), but of such knowledges as do handle and inquire of the faculty of reason: so as poesy had his true place. As for the power of the imagination in nature, and the manner of fortifying the same, we have mentioned it in the doctrine De Anima, whereunto most fitly it belongeth. And lastly, for imaginative or insinuating reason, which is the subject of rhetoric, we think it best to refer it to the arts of reason. So therefore we content ourselves with the former division, that human philosophy, which respecteth the faculties of the mind of man, hath two parts, rational and moral.

(2) The part of human philosophy which is rational is of all knowledges, to the most wits, the least delightful, and seemeth but a net of subtlety and spinosity. For as it was truly said, that knowledge is pabulum animi; so in the nature of men's appetite to this food most men are of the taste and stomach of the Israelites in the desert, that would fain have returned ad ollas carnum, and were weary of manna; which, though it were celestial, yet seemed less nutritive and comfortable. So generally men taste well knowledges that are drenched in flesh and blood, civil history, morality, policy, about the which men's affections, praises, fortunes do turn and are conversant. But this same lumen siccum doth parch and offend most men's watery and soft natures. But to speak truly of things as they are in worth, rational knowledges are the keys of all other arts, for as Aristotle saith aptly and elegantly, "That the

hand is the instrument of instruments, and the mind is the form of forms;" so these be truly said to be the art of arts. Neither do they only direct, but likewise confirm and strengthen; even as the habit of shooting doth not only enable to shoot a nearer shoot, but also to draw a stronger bow.

(3) The arts intellectual are four in number, divided according to the ends whereunto they are referred--for man's labour is to invent that which is sought or propounded; or to judge that which is invented; or to retain that which is judged; or to deliver over that which is retained. So as the arts must be four--art of inquiry or invention; art of examination or judgment; art of custody or memory; and art of elocution or tradition.

XIII. (1) Invention is of two kinds much differing--the one of arts and sciences, and the other of speech and arguments. The former of these I do report deficient; which seemeth to me to be such a deficiency as if, in the making of an inventory touching the state of a defunct, it should be set down that there is no ready money. For as money will fetch all other commodities, so this knowledge is that which should purchase all the rest. And like as the West Indies had never been discovered if the use of the mariner's needle had not been first discovered, though the one be vast regions, and the other a small motion; so it cannot be found strange if sciences be no further discovered, if the art itself of invention and discovery hath been passed over.

(2) That this part of knowledge is wanting, to my judgment standeth plainly confessed; for first, logic doth not pretend to invent sciences, or the axioms of sciences, but passeth it over with a *cuique in sua arte credendum*. And Celsus acknowledgeth it gravely, speaking of the empirical and dogmatical sects of physicians, "That medicines and cures were first found out, and then after the reasons and causes were discoursed; and not the causes first found out, and by light from them the medicines and cures discovered." And Plato in his "Theaetetus" noteth well, "That particulars are infinite, and the higher generalities give no sufficient direction; and that the pith of all sciences, which maketh the artsman differ from the inexpert, is in the middle propositions, which in every particular knowledge are taken from tradition and experience." And therefore we see, that they which discourse of the inventions and originals of things refer them rather to chance than to art, and rather to beasts, birds, fishes, serpents, than to men.

"*Dictamnum genetrix Cretaea carpit ab Ida,
Puberibus caulem foliis et flore camantem
Purpureo; non illa feris incognita capris
Gramina, cum tergo volucres haesere sagittae.*"

So that it was no marvel (the manner of antiquity being to consecrate inventors) that the Egyptians had so few human idols in their temples, but almost all brute:

"*Omnigenumque Deum monstra, et Iatrator Anubis,
Contra Neptunum, et Venerem, contraque Minervam, &c.*"

And if you like better the tradition of the Grecians, and ascribe the first inventions to men, yet you will rather believe that Prometheus first stroke the flints, and marvelled at the spark, than that when he first stroke the flints he expected the spark; and therefore we see the West Indian Prometheus had no intelligence with the European, because of the rareness with them of flint, that gave the first occasion. So as it should seem, that hitherto men are rather beholden to a wild goat for surgery, or to a nightingale for music, or to the ibis for some part of physic, or to the pot-lid that flew open for artillery, or generally to chance or anything else than to logic for the invention of arts and sciences. Neither is the form of invention which Virgil describeth much other:

"Ut varias usus meditande extunderet artes
Paulatim."

For if you observe the words well, it is no other method than that which brute beasts are capable of, and do put in ure; which is a perpetual intending or practising some one thing, urged and imposed by an absolute necessity of conservation of being. For so Cicero saith very truly, *Usus uni rei deditus et naturam et artem saepe vincit*. And therefore if it be said of men,

"Labor omnia vincit
Improbis, et duris urgens in rebus egestas,"

it is likewise said of beasts, *Quis psittaco docuit suum* ?a??e? Who taught the raven in a drought to throw pebbles into a hollow tree, where she spied water, that the water might rise so as she might come to it? Who taught the bee to sail through such a vast sea or air, and to find the way from a field in a flower a great way off to her hive? Who taught the ant to bite every grain of corn that she burieth in her hill, lest it should take root and grow? Add then the word *extundere*, which importeth the extreme difficulty, and the word *paulatim*, which importeth the extreme slowness, and we are where we were, even amongst the Egyptians' gods; there being little left to the faculty of reason, and nothing to the duty or art, for matter of invention.

(3) Secondly, the induction which the logicians speak of, and which seemeth familiar with Plato, whereby the principles of sciences may be pretended to be invented, and so the middle propositions by derivation from the principles; their form of induction, I say, is utterly vicious and incompetent; wherein their error is the fouler, because it is the duty of art to perfect and exalt nature; but they contrariwise have wronged, abused, and traduced nature. For he that shall attentively observe how the mind doth gather this excellent dew of knowledge, like unto that which the poet speaketh of, *Aerei mellis caelestia dona*, distilling and contriving it out of particulars natural and artificial, as the flowers of the field and garden, shall find that the mind of herself by nature doth manage and act an induction much better than they describe it. For to conclude upon an enumeration of particulars, without instance contradictory, is no conclusion, but a conjecture; for who can

assure (in many subjects) upon those particulars which appear of a side, that there are not other on the contrary side which appear not? As if Samuel should have rested upon those sons of Jesse which were brought before him, and failed of David which was in the field. And this form (to say truth), is so gross, as it had not been possible for wits so subtle as have managed these things to have offered it to the world, but that they hasted to their theories and dogmaticals, and were imperious and scornful toward particulars; which their manner was to use but as *lictors* and *viatores*, for sergeants and whifflers, *ad summovendam turbam*, to make way and make room for their opinions, rather than in their true use and service. Certainly it is a thing may touch a man with a religious wonder, to see how the footsteps of seducement are the very same in divine and human truth; for, as in divine truth man cannot endure to become as a child, so in human, they reputed the attending the inductions (whereof we speak), as if it were a second infancy or childhood.

(4) Thirdly, allow some principles or axioms were rightly induced, yet, nevertheless, certain it is that middle propositions cannot be deduced from them in subject of nature by syllogism--that is, by touch and reduction of them to principles in a middle term. It is true that in sciences popular, as moralities, laws, and the like, yea, and divinity (because it pleaseth God to apply Himself to the capacity of the simplest), that form may have use; and in natural philosophy likewise, by way of argument or satisfactory reason, *Quae assensum parit operis effaeta est*; but the subtlety of nature and operations will not be enchained in those bonds. For arguments consist of propositions, and propositions of words, and words are but the current tokens or marks of popular notions of things; which notions, if they be grossly and variably collected out of particulars, it is not the laborious examination either of consequences of arguments, or of the truth of propositions, that can ever correct that error, being (as the physicians speak) in the first digestion. And, therefore, it was not without cause, that so many excellent philosophers became sceptics and academics, and denied any certainty of knowledge or comprehension; and held opinion that the knowledge of man extended only to appearances and probabilities. It is true that in Socrates it was supposed to be but a form of irony, *Scientiam dissimulando simulavit*; for he used to disable his knowledge, to the end to enhance his knowledge; like the humour of Tiberius in his beginnings, that would reign, but would not acknowledge so much. And in the later academy, which Cicero embraced, this opinion also of *acatalepsia* (I doubt) was not held sincerely; for that all those which excelled in copy of speech seem to have chosen that sect, as that which was fittest to give glory to their eloquence and variable discourses; being rather like progresses of pleasure than journeys to an end. But assuredly many scattered in both academies did hold it in subtlety and integrity. But here was their chief error: they charged the deceit upon the senses; which in my judgment (notwithstanding all their cavillations) are very sufficient to certify and report truth, though not always immediately, yet by comparison, by help of instrument, and by producing and urging such things as are too subtle for the sense to some effect comprehensible by the sense, and other like assistance. But they ought to have charged the deceit upon the weakness of the intellectual powers, and upon the manner of collecting and concluding upon the reports of the senses. This I speak, not to disable the mind of man, but to stir it up to seek help; for no man, be he never so cunning or practised, can make a

straight line or perfect circle by steadiness of hand, which may be easily done by help of a ruler or compass.

(5) This part of invention, concerning the invention of sciences, I purpose (if God give me leave) hereafter to propound, having digested it into two parts: whereof the one I term *experientia literata*, and the other *interpretatio naturae*; the former being but a degree and rudiment of the latter. But I will not dwell too long, nor speak too great upon a promise.

(6) The invention of speech or argument is not properly an invention; for to invent is to discover that we know not, and not to recover or resummon that which we already know; and the use of this invention is no other but, out of the knowledge whereof our mind is already possessed to draw forth or call before us that which may be pertinent to the purpose which we take into our consideration. So as to speak truly, it is no invention, but a remembrance or suggestion, with an application; which is the cause why the schools do place it after judgment, as subsequent and not precedent. Nevertheless, because we do account it a chase as well of deer in an enclosed park as in a forest at large, and that it hath already obtained the name, let it be called invention; so as it be perceived and discerned, that the scope and end of this invention is readiness and present use of our knowledge, and not addition or amplification thereof.

(7) To procure this ready use of knowledge there are two courses, preparation and suggestion. The former of these seemeth scarcely a part of knowledge, consisting rather of diligence than of any artificial erudition. And herein Aristotle wittily, but hurtfully, doth deride the sophists near his time, saying, "They did as if one that professed the art of shoemaking should not teach how to make up a shoe, but only exhibit in a readiness a number of shoes of all fashions and sizes." But yet a man might reply, that if a shoemaker should have no shoes in his shop, but only work as he is bespoke, he should be weakly customed. But our Saviour, speaking of divine knowledge, saith, "That the kingdom of heaven is like a good householder, that bringeth forth both new and old store;" and we see the ancient writers of rhetoric do give it in precept, that pleaders should have the places, whereof they have most continual use, ready handled in all the variety that may be; as that, to speak for the literal interpretation of the law against equity, and contrary; and to speak for presumptions and inferences against testimony, and contrary. And Cicero himself, being broken unto it by great experience, delivereth it plainly, that whatsoever a man shall have occasion to speak of (if he will take the pains), he may have it in effect premeditated and handled in thesis. So that when he cometh to a particular he shall have nothing to do, but to put to names, and times, and places, and such other circumstances of individuals. We see likewise the exact diligence of Demosthenes; who, in regard of the great force that the entrance and access into causes hath to make a good impression, had ready framed a number of prefaces for orations and speeches. All which authorities and precedents may outweigh Aristotle's opinion, that would have us change a rich wardrobe for a pair of shears.

(8) But the nature of the collection of this provision or preparatory store, though it be common both to logic and rhetoric, yet having made an entry of it here, where it came first to be

spoken of, I think fit to refer over the further handling of it to rhetoric.

(9) The other part of invention, which I term suggestion, doth assign and direct us to certain marks, or places, which may excite our mind to return and produce such knowledge as it hath formerly collected, to the end we may make use thereof. Neither is this use (truly taken) only to furnish argument to dispute, probably with others, but likewise to minister unto our judgment to conclude aright within ourselves. Neither may these places serve only to apprompt our invention, but also to direct our inquiry. For a faculty of wise interrogating is half a knowledge. For as Plato saith, "Whosoever seeketh, knoweth that which he seeketh for in a general notion; else how shall he know it when he hath found it?" And, therefore, the larger your anticipation is, the more direct and compendious is your search. But the same places which will help us what to produce of that which we know already, will also help us, if a man of experience were before us, what questions to ask; or, if we have books and authors to instruct us, what points to search and revolve; so as I cannot report that this part of invention, which is that which the schools call topics, is deficient.

(10) Nevertheless, topics are of two sorts, general and special. The general we have spoken to; but the particular hath been touched by some, but rejected generally as inartificial and variable. But leaving the humour which hath reigned too much in the schools (which is, to be vainly subtle in a few things which are within their command, and to reject the rest), I do receive particular topics; that is, places or directions of invention and inquiry in every particular knowledge, as things of great use, being mixtures of logic with the matter of sciences. For in these it holdeth *ars inveniendi adolescit cum inventis*; for as in going of a way, we do not only gain that part of the way which is passed, but we gain the better sight of that part of the way which remaineth, so every degree of proceeding in a science giveth a light to that which followeth; which light, if we strengthen by drawing it forth into questions or places of inquiry, we do greatly advance our pursuit.

XIV. (1) Now we pass unto the arts of judgment, which handle the natures of proofs and demonstrations, which as to induction hath a coincidence with invention; for all inductions, whether in good or vicious form, the same action of the mind which inventeth, judgeth--all one as in the sense. But otherwise it is in proof by syllogism, for the proof being not immediate, but by mean, the invention of the mean is one thing, and the judgment of the consequence is another; the one exciting only, the other examining. Therefore, for the real and exact form of judgment, we refer ourselves to that which we have spoken of interpretation of Nature.

(2) For the other judgment by syllogism, as it is a thing most agreeable to the mind of man, so it hath been vehemently and excellently laboured. For the nature of man doth extremely covet to have somewhat in his understanding fixed and unmovable, and as a rest and support of the mind. And, therefore, as Aristotle endeavoureth to prove, that in all motion there is some point quiescent; and as he elegantly expoundeth the ancient fable of Atlas (that stood fixed, and bare up the heaven from falling) to be meant of the poles or axle-tree of heaven, whereupon the conversion is accomplished, so assuredly men have a desire to have an Atlas or

axle-tree within to keep them from fluctuation, which is like to a perpetual peril of falling. Therefore men did hasten to set down some principles about which the variety of their disputations might turn.

(3) So, then, this art of judgment is but the reduction of propositions to principles in a middle term. The principles to be agreed by all and exempted from argument; the middle term to be elected at the liberty of every man's invention; the reduction to be of two kinds, direct and inverted: the one when the proposition is reduced to the principle, which they term a probation ostensive; the other, when the contradictory of the proposition is reduced to the contradictory of the principle, which is that which they call per incommodum, or pressing an absurdity; the number of middle terms to be as the proposition standeth degrees more or less removed from the principle.

(4) But this art hath two several methods of doctrine, the one by way of direction, the other by way of caution: the former frameth and setteth down a true form of consequence, by the variations and deflections from which errors and inconsequences may be exactly judged. Toward the composition and structure of which form it is incident to handle the parts thereof, which are propositions, and the parts of propositions, which are simple words. And this is that part of logic which is comprehended in the Analytics.

(5) The second method of doctrine was introduced for expedite use and assurance sake, discovering the more subtle forms of sophisms and illaqueations with their redargutions, which is that which is termed elenches. For although in the more gross sorts of fallacies it happeneth (as Seneca maketh the comparison well) as in juggling feats, which, though we know not how they are done, yet we know well it is not as it seemeth to be; yet the more subtle sort of them doth not only put a man besides his answer, but doth many times abuse his judgment.

(6) This part concerning elenches is excellently handled by Aristotle in precept, but more excellently by Plato in example; not only in the persons of the sophists, but even in Socrates himself, who, professing to affirm nothing, but to infirm that which was affirmed by another, hath exactly expressed all the forms of objection, fallace, and redargution. And although we have said that the use of this doctrine is for redargution, yet it is manifest the degenerate and corrupt use is for caption and contradiction, which passeth for a great faculty, and no doubt is of very great advantage, though the difference be good which was made between orators and sophisters, that the one is as the greyhound, which hath his advantage in the race, and the other as the hare, which hath her advantage in the turn, so as it is the advantage of the weaker creature.

(7) But yet further, this doctrine of elenches hath a more ample latitude and extent than is perceived; namely, unto divers parts of knowledge, whereof some are laboured and other omitted. For first, I conceive (though it may seem at first somewhat strange) that that part which is variably referred, sometimes to logic, sometimes to metaphysic, touching the common adjuncts of essences, is but an elenche; for the great sophism of all sophisms being equivocation or ambiguity of words and phrase, specially of such words as are most

general and intervene in every inquiry, it seemeth to me that the true and fruitful use (leaving vain subtleties and speculations) of the inquiry of majority, minority, priority, posteriority, identity, diversity, possibility, act, totality, parts, existence, privation, and the like, are but wise cautions against ambiguities of speech. So, again, the distribution of things into certain tribes, which we call categories or predicaments, are but cautions against the confusion of definitions and divisions.

(8) Secondly, there is a seducement that worketh by the strength of the impression, and not by the subtlety of the illaqueation--not so much perplexing the reason, as overruling it by power of the imagination. But this part I think more proper to handle when I shall speak of rhetoric.

(9) But lastly, there is yet a much more important and profound kind of fallacies in the mind of man, which I find not observed or inquired at all, and think good to place here, as that which of all others appertaineth most to rectify judgment, the force whereof is such as it doth not dazzle or snare the understanding in some particulars, but doth more generally and inwardly infect and corrupt the state thereof. For the mind of man is far from the nature of a clear and equal glass, wherein the beams of things should reflect according to their true incidence; nay, it is rather like an enchanted glass, full of superstition and imposture, if it be not delivered and reduced. For this purpose, let us consider the false appearances that are imposed upon us by the general nature of the mind, beholding them in an example or two; as first, in that instance which is the root of all superstition, namely, that to the nature of the mind of all men it is consonant for the affirmative or active to affect more than the negative or privative. So that a few times hitting or presence countervails oftentimes failing or absence, as was well answered by Diagoras to him that showed him in Neptune's temple the great number of pictures of such as had escaped shipwreck, and had paid their vows to Neptune, saying, "Advise now, you that think it folly to invoke Neptune in tempest." "Yea, but," saith Diagoras, "where are they painted that are drowned?" Let us behold it in another instance, namely, that the spirit of man, being of an equal and uniform substance, doth usually suppose and feign in nature a greater equality and uniformity than is in truth. Hence it cometh that the mathematicians cannot satisfy themselves except they reduce the motions of the celestial bodies to perfect circles, rejecting spiral lines, and labouring to be discharged of eccentrics. Hence it cometh that whereas there are many things in Nature as it were monodica, sui juris, yet the cogitations of man do feign unto them relatives, parallels, and conjugates, whereas no such thing is; as they have feigned an element of fire to keep square with earth, water, and air, and the like. Nay, it is not credible, till it be opened, what a number of fictions and fantasies the similitude of human actions and arts, together with the making of man communis mensura, have brought into natural philosophy; not much better than the heresy of the Anthropomorphites, bred in the cells of gross and solitary monks, and the opinion of Epicurus, answerable to the same in heathenism, who supposed the gods to be of human shape. And, therefore, Velleius the Epicurean needed not to have asked why God should have adorned the heavens with stars, as if He had been an aedilis, one that should have set forth some magnificent shows or plays. For if that great Work-master had been of a human disposition, He would

have cast the stars into some pleasant and beautiful works and orders like the frets in the roofs of houses; whereas one can scarce find a posture in square, or triangle, or straight line, amongst such an infinite number, so differing a harmony there is between the spirit of man and the spirit of Nature.

(10) Let us consider again the false appearances imposed upon us by every man's own individual nature and custom in that feigned supposition that Plato maketh of the cave; for certainly if a child were continued in a grot or cave under the earth until maturity of age, and came suddenly abroad, he would have strange and absurd imaginations. So, in like manner, although our persons live in the view of heaven, yet our spirits are included in the caves of our own complexions and customs, which minister unto us infinite errors and vain opinions if they be not recalled to examination. But hereof we have given many examples in one of the errors, or peccant humours, which we ran briefly over in our first book.

(11) And lastly, let us consider the false appearances that are imposed upon us by words, which are framed and applied according to the conceit and capacities of the vulgar sort; and although we think we govern our words, and prescribe it well *loquendum ut vulgus sentiendum ut sapientes*, yet certain it is that words, as a Tartar's bow, do shoot back upon the understanding of the wisest, and mightily entangle and pervert the judgment. So as it is almost necessary in all controversies and disputations to imitate the wisdom of the mathematicians, in setting down in the very beginning the definitions of our words and terms, that others may know how we accept and understand them, and whether they concur with us or no. For it cometh to pass, for want of this, that we are sure to end there where we ought to have begun, which is, in questions and differences about words. To conclude, therefore, it must be confessed that it is not possible to divorce ourselves from these fallacies and false appearances because they are inseparable from our nature and condition of life; so yet, nevertheless, the caution of them (for all *elenches*, as was said, are but cautions) doth extremely import the true conduct of human judgment. The particular *elenches* or cautions against these three false appearances I find altogether deficient.

(12) There remaineth one part of judgment of great excellency which to mine understanding is so slightly touched, as I may report that also deficient; which is the application of the differing kinds of proofs to the differing kinds of subjects. For there being but four kinds of demonstrations, that is, by the immediate consent of the mind or sense, by induction, by syllogism, and by congruity, which is that which Aristotle calleth demonstration in orb or circle, and not a *notioribus*, every of these hath certain subjects in the matter of sciences, in which respectively they have chiefest use; and certain others, from which respectively they ought to be excluded; and the rigour and curiosity in requiring the more severe proofs in some things, and chiefly the facility in contenting ourselves with the more remiss proofs in others, hath been amongst the greatest causes of detriment and hindrance to knowledge. The distributions and assignations of demonstrations according to the analogy of sciences I note as deficient.

XV. (1) The custody or retaining of knowledge is either in writing or memory; whereof writing hath two parts, the nature of the

character and the order of the entry. For the art of characters, or other visible notes of words or things, it hath nearest conjugation with grammar, and, therefore, I refer it to the due place; for the disposition and collocation of that knowledge which we preserve in writing, it consisteth in a good digest of common-places, wherein I am not ignorant of the prejudice imputed to the use of common-place books, as causing a retardation of reading, and some sloth or relaxation of memory. But because it is but a counterfeit thing in knowledges to be forward and pregnant, except a man be deep and full, I hold the entry of common-places to be a matter of great use and essence in studying, as that which assureth copy of invention, and contracteth judgment to a strength. But this is true, that of the methods of common-places that I have seen, there is none of any sufficient worth, all of them carrying merely the face of a school and not of a world; and referring to vulgar matters and pedantical divisions, without all life or respect to action.

(2) For the other principal part of the custody of knowledge, which is memory, I find that faculty in my judgment weakly inquired of. An art there is extant of it; but it seemeth to me that there are better precepts than that art, and better practices of that art than those received. It is certain the art (as it is) may be raised to points of ostentation prodigious; but in use (as is now managed) it is barren, not burdensome, nor dangerous to natural memory, as is imagined, but barren, that is, not dexterous to be applied to the serious use of business and occasions. And, therefore, I make no more estimation of repeating a great number of names or words upon once hearing, or the pouring forth of a number of verses or rhymes extempore, or the making of a satirical simile of everything, or the turning of everything to a jest, or the falsifying or contradicting of everything by cavil, or the like (whereof in the faculties of the mind there is great copy, and such as by device and practice may be exalted to an extreme degree of wonder), than I do of the tricks of tumblers, funambuloes, baladines; the one being the same in the mind that the other is in the body, matters of strangeness without worthiness.

(3) This art of memory is but built upon two intentions; the one prenotation, the other emblem. Prenotation dischargeth the indefinite seeking of that we would remember, and directeth us to seek in a narrow compass, that is, somewhat that hath congruity with our place of memory. Emblem reduceth conceits intellectual to images sensible, which strike the memory more; out of which axioms may be drawn much better practice than that in use; and besides which axioms, there are divers more touching help of memory not inferior to them. But I did in the beginning distinguish, not to report those things deficient, which are but only ill managed.

XVI. (1) There remaineth the fourth kind of rational knowledge, which is transitive, concerning the expressing or transferring our knowledge to others, which I will term by the general name of tradition or delivery. Tradition hath three parts: the first concerning the organ of tradition; the second concerning the method of tradition; and the third concerning the illustration of tradition.

(2) For the organ of tradition, it is either speech or writing; for Aristotle saith well, "Words are the images of cogitations, and letters are the images of words." But yet it is not of necessity

that cogitations be expressed by the medium of words. For whatsoever is capable of sufficient differences, and those perceptible by the sense, is in nature competent to express cogitations. And, therefore, we see in the commerce of barbarous people that understand not one another's language, and in the practice of divers that are dumb and deaf, that men's minds are expressed in gestures, though not exactly, yet to serve the turn. And we understand further, that it is the use of China and the kingdoms of the High Levant to write in characters real, which express neither letters nor words in gross, but things or notions; insomuch as countries and provinces which understand not one another's language can nevertheless read one another's writings, because the characters are accepted more generally than the languages do extend; and, therefore, they have a vast multitude of characters, as many, I suppose, as radical words.

(3) These notes of cogitations are of two sorts: the one when the note hath some similitude or congruity with the notion; the other ad placitum, having force only by contract or acceptation. Of the former sort are hieroglyphics and gestures. For as to hieroglyphics (things of ancient use and embraced chiefly by the Egyptians, one of the most ancient nations), they are but as continued impresses and emblems. And as for gestures, they are as transitory hieroglyphics, and are to hieroglyphics as words spoken are to words written, in that they abide not; but they have evermore, as well as the other, an affinity with the things signified. As Periander, being consulted with how to preserve a tyranny newly usurped, bid the messenger attend and report what he saw him do; and went into his garden and topped all the highest flowers, signifying that it consisted in the cutting off and keeping low of the nobility and grandees. Ad placitum, are the characters real before mentioned, and words: although some have been willing by curious inquiry, or rather by apt feigning, to have derived imposition of names from reason and intendment; a speculation elegant, and, by reason it searcheth into antiquity, reverent, but sparingly mixed with truth, and of small fruit. This portion of knowledge touching the notes of things and cogitations in general, I find not inquired, but deficient. And although it may seem of no great use, considering that words and writings by letters do far excel all the other ways; yet because this part concerneth, as it were, the mint of knowledge (for words are the tokens current and accepted for conceits, as moneys are for values, and that it is fit men be not ignorant that moneys may be of another kind than gold and silver), I thought good to propound it to better inquiry.

(4) Concerning speech and words, the consideration of them hath produced the science of grammar. For man still striveth to reintegrate himself in those benedictions, from which by his fault he hath been deprived; and as he hath striven against the first general curse by the invention of all other arts, so hath he sought to come forth of the second general curse (which was the confusion of tongues) by the art of grammar; whereof the use in a mother tongue is small, in a foreign tongue more; but most in such foreign tongues as have ceased to be vulgar tongues, and are turned only to learned tongues. The duty of it is of two natures: the one popular, which is for the speedy and perfect attaining languages, as well for intercourse of speech as for understanding of authors; the other philosophical, examining the power and nature of words, as they are the footsteps and prints of reason: which kind of analogy

between words and reason is handled sparsim, brokenly though not entirely; and, therefore, I cannot report it deficient, though I think it very worthy to be reduced into a science by itself.

(5) Unto grammar also belongeth, as an appendix, the consideration of the accidents of words; which are measure, sound, and elevation or accent, and the sweetness and harshness of them: whence hath issued some curious observations in rhetoric, but chiefly poesy, as we consider it, in respect of the verse and not of the argument. Wherein though men in learned tongues do tie themselves to the ancient measures, yet in modern languages it seemeth to me as free to make new measures of verses as of dances; for a dance is a measured pace, as a verse is a measured speech. In these things this sense is better judge than the art:

"Coenae fercula nostrae
Mallem convivis quam placuisse cocis."

And of the servile expressing antiquity in an unlike and an unfit subject, it is well said, "Quod tempore antiquum videtur, id incongruitate est maxime novum."

(6) For ciphers, they are commonly in letters or alphabets, but may be in words. The kinds of ciphers (besides the simple ciphers, with changes, and intermixtures of nulls and non-significants) are many, according to the nature or rule of the infolding, wheel-ciphers, key-ciphers, doubles, &c. But the virtues of them, whereby they are to be preferred, are three; that they be not laborious to write and read; that they be impossible to decipher; and, in some cases, that they be without suspicion. The highest degree whereof is to write omnia per omnia; which is undoubtedly possible, with a proportion quintuple at most of the writing infolding to the writing infolded, and no other restraint whatsoever. This art of ciphering hath for relative an art of deciphering, by supposition unprofitable, but, as things are, of great use. For suppose that ciphers were well managed, there be multitudes of them which exclude the decipherer. But in regard of the rawness and unskilfulness of the hands through which they pass, the greatest matters are many times carried in the weakest ciphers.

(7) In the enumeration of these private and retired arts it may be thought I seek to make a great muster-roll of sciences, naming them for show and ostentation, and to little other purpose. But let those, which are skilful in them, judge whether I bring them in only for appearance, or whether in that which I speak of them (though in few words) there be not some seed of proficience. And this must be remembered, that as there be many of great account in their countries and provinces, which, when they come up to the seat of the estate, are but of mean rank and scarcely regarded; so these arts, being here placed with the principal and supreme sciences, seem petty things: yet to such as have chosen them to spend their labours and studies in them, they seem great matters.

XVII. (1) For the method of tradition, I see it hath moved a controversy in our time. But as in civil business, if there be a meeting, and men fall at words, there is commonly an end of the matter for that time, and no proceeding at all; so in learning,

where there is much controversy, there is many times little inquiry. For this part of knowledge of method seemeth to me so weakly inquired as I shall report it deficient.

(2) Method hath been placed, and that not amiss, in logic, as a part of judgment. For as the doctrine of syllogisms comprehendeth the rules of judgment upon that which is invented, so the doctrine of method containeth the rules of judgment upon that which is to be delivered; for judgment precedeth delivery, as it followeth invention. Neither is the method or the nature of the tradition material only to the use of knowledge, but likewise to the progression of knowledge: for since the labour and life of one man cannot attain to perfection of knowledge, the wisdom of the tradition is that which inspireth the felicity of continuance and proceeding. And therefore the most real diversity of method is of method referred to use, and method referred to progression: whereof the one may be termed magistral, and the other of probation.

(3) The latter whereof seemeth to be *via deserta et interclusa*. For as knowledges are now delivered, there is a kind of contract of error between the deliverer and the receiver. For he that delivereth knowledge desireth to deliver it in such form as may be best believed, and not as may be best examined; and he that receiveth knowledge desireth rather present satisfaction than expectant inquiry; and so rather not to doubt, than not to err: glory making the author not to lay open his weakness, and sloth making the disciple not to know his strength.

(4) But knowledge that is delivered as a thread to be spun on ought to be delivered and intimated, if it were possible, in the same method wherein it was invented: and so is it possible of knowledge induced. But in this same anticipated and prevented knowledge, no man knoweth how he came to the knowledge which he hath obtained. But yet, nevertheless, *secundum majus et minus*, a man may revisit and descend unto the foundations of his knowledge and consent; and so transplant it into another, as it grew in his own mind. For it is in knowledges as it is in plants: if you mean to use the plant, it is no matter for the roots--but if you mean to remove it to grow, then it is more assured to rest upon roots than slips: so the delivery of knowledges (as it is now used) is as of fair bodies of trees without the roots; good for the carpenter, but not for the planter. But if you will have sciences grow, it is less matter for the shaft or body of the tree, so you look well to the taking up of the roots. Of which kind of delivery the method of the mathematics, in that subject, hath some shadow: but generally I see it neither put in use nor put in inquisition, and therefore note it for deficient.

(5) Another diversity of method there is, which hath some affinity with the former, used in some cases by the discretion of the ancients, but disgraced since by the impostures of many vain persons, who have made it as a false light for their counterfeit merchandises; and that is enigmatical and disclosed. The pretence whereof is, to remove the vulgar capacities from being admitted to the secrets of knowledges, and to reserve them to selected auditors, or wits of such sharpness as can pierce the veil.

(6) Another diversity of method, whereof the consequence is great, is the delivery of knowledge in aphorisms, or in methods; wherein we

may observe that it hath been too much taken into custom, out of a few axioms or observations upon any subject, to make a solemn and formal art, filling it with some discourses, and illustrating it with examples, and digesting it into a sensible method. But the writing in aphorisms hath many excellent virtues, whereto the writing in method doth not approach.

(7) For first, it trieth the writer, whether he be superficial or solid: for aphorisms, except they should be ridiculous, cannot be made but of the pith and heart of sciences; for discourse of illustration is cut off; recitals of examples are cut off; discourse of connection and order is cut off; descriptions of practice are cut off. So there remaineth nothing to fill the aphorisms but some good quantity of observation; and therefore no man can suffice, nor in reason will attempt, to write aphorisms, but he that is sound and grounded. But in methods,

"Tantum series juncturaque pollet,
Tantum de medio sumptis accedit honoris,"

as a man shall make a great show of an art, which, if it were disjointed, would come to little. Secondly, methods are more fit to win consent or belief, but less fit to point to action; for they carry a kind of demonstration in orb or circle, one part illuminating another, and therefore satisfy. But particulars being dispersed do best agree with dispersed directions. And lastly, aphorisms, representing a knowledge broken, do invite men to inquire further; whereas methods, carrying the show of a total, do secure men, as if they were at furthest.

(8) Another diversity of method, which is likewise of great weight, is the handling of knowledge by assertions and their proofs, or by questions and their determinations. The latter kind whereof, if it be immoderately followed, is as prejudicial to the proceeding of learning as it is to the proceeding of an army to go about to besiege every little fort or hold. For if the field be kept, and the sum of the enterprise pursued, those smaller things will come in of themselves: indeed a man would not leave some important piece enemy at his back. In like manner, the use of confutation in the delivery of sciences ought to be very sparing; and to serve to remove strong preoccupations and prejudgments, and not to minister and excite disputatious and doubts.

(9) Another diversity of method is, according to the subject or matter which is handled. For there is a great difference in delivery of the mathematics, which are the most abstracted of knowledges, and policy, which is the most immersed. And howsoever contention hath been moved, touching a uniformity of method in multiformity of matter, yet we see how that opinion, besides the weakness of it, hath been of ill desert towards learning, as that which taketh the way to reduce learning to certain empty and barren generalities; being but the very husks and shells of sciences, all the kernel being forced out and expelled with the torture and press of the method. And, therefore, as I did allow well of particular topics for invention, so I do allow likewise of particular methods of tradition.

(10) Another diversity of judgment in the delivery and teaching of knowledge is, according unto the light and presuppositions of that which is delivered. For that knowledge which is new, and foreign from opinions received, is to be delivered in another form than that that is agreeable and familiar; and therefore Aristotle, when he thinks to tax Democritus, doth in truth commend him, where he saith "If we shall indeed dispute, and not follow after similitudes," &c. For those whose conceits are seated in popular opinions need only but to prove or dispute; but those whose conceits are beyond popular opinions, have a double labour; the one to make themselves conceived, and the other to prove and demonstrate. So that it is of necessity with them to have recourse to similitudes and translations to express themselves. And therefore in the infancy of learning, and in rude times when those conceits which are now trivial were then new, the world was full of parables and similitudes; for else would men either have passed over without mark, or else rejected for paradoxes that which was offered, before they had understood or judged. So in divine learning, we see how frequent parables and tropes are, for it is a rule, that whatsoever science is not consonant to presuppositions must pray in aid of similitudes.

(11) There be also other diversities of methods vulgar and received: as that of resolution or analysis, of constitution or systasis, of concealment or cryptic, &c., which I do allow well of, though I have stood upon those which are least handled and observed. All which I have remembered to this purpose, because I would erect and constitute one general inquiry (which seems to me deficient) touching the wisdom of tradition.

(12) But unto this part of knowledge, concerning method, doth further belong not only the architecture of the whole frame of a work, but also the several beams and columns thereof; not as to their stuff, but as to their quantity and figure. And therefore method considereth not only the disposition of the argument or subject, but likewise the propositions: not as to their truth or matter, but as to their limitation and manner. For herein Ramus merited better a great deal in reviving the good rules of propositions--?a????? p??t??, ??ta pa?t?? &c.--than he did in introducing the canker of epitomes; and yet (as it is the condition of human things that, according to the ancient fables, "the most precious things have the most pernicious keepers") it was so, that the attempt of the one made him fall upon the other. For he had need be well conducted that should design to make axioms convertible, if he make them not withal circular, and non-promovent, or incurring into themselves; but yet the intention was excellent.

(13) The other considerations of method, concerning propositions, are chiefly touching the utmost propositions, which limit the dimensions of sciences: for every knowledge may be fitly said, besides the profundity (which is the truth and substance of it, that makes it solid), to have a longitude and a latitude; accounting the latitude towards other sciences, and the longitude towards action; that is, from the greatest generality to the most particular precept. The one giveth rule how far one knowledge ought to intermeddle within the province of another, which is the rule they call ?a?a?t?; the other giveth rule unto what degree of particularity a knowledge should descend: which latter I find passed over in silence, being in my judgment the more material. For certainty there must be somewhat left to practice; but how much is

worthy the inquiry? We see remote and superficial generalities do but offer knowledge to scorn of practical men; and are no more aiding to practice than an Ortelius' universal map is to direct the way between London and York. The better sort of rules have been not unfitly compared to glasses of steel unpolished, where you may see the images of things, but first they must be filed: so the rules will help if they be laboured and polished by practice. But how crystalline they may be made at the first, and how far forth they may be polished aforehand, is the question, the inquiry whereof seemeth to me deficient.

(14) There hath been also laboured and put in practice a method, which is not a lawful method, but a method of imposture: which is, to deliver knowledges in such manner as men may speedily come to make a show of learning, who have it not. Such was the travail of Raymundus Lullius in making that art which bears his name; not unlike to some books of typocosmy, which have been made since; being nothing but a mass of words of all arts, to give men countenance, that those which use the terms might be thought to understand the art; which collections are much like a fripper's or broker's shop, that hath ends of everything, but nothing of worth.

XVIII. (1) Now we descend to that part which concerneth the illustration of tradition, comprehended in that science which we call rhetoric, or art of eloquence, a science excellent, and excellently well laboured. For although in true value it is inferior to wisdom (as it is said by God to Moses, when he disabled himself for want of this faculty, "Aaron shall be thy speaker, and thou shalt be to him as God"), yet with people it is the more mighty; for so Solomon saith, *Sapiens corde appellabitur prudens, sed dulcis eloquio majora reperiet*, signifying that profoundness of wisdom will help a man to a name or admiration, but that it is eloquence that prevaieth in an active life. And as to the labouring of it, the emulation of Aristotle with the rhetoricians of his time, and the experience of Cicero, hath made them in their works of rhetoric exceed themselves. Again, the excellency of examples of eloquence in the orations of Demosthenes and Cicero, added to the perfection of the precepts of eloquence, hath doubled the progression in this art; and therefore the deficiencies which I shall note will rather be in some collections, which may as handmaids attend the art, than in the rules or use of the art itself.

(2) Notwithstanding, to stir the earth a little about the roots of this science, as we have done of the rest, the duty and office of rhetoric is to apply reason to imagination for the better moving of the will. For we see reason is disturbed in the administration thereof by three means--by illaqueation or sophism, which pertains to logic; by imagination or impression, which pertains to rhetoric; and by passion or affection, which pertains to morality. And as in negotiation with others, men are wrought by cunning, by importunity, and by vehemency; so in this negotiation within ourselves, men are undermined by inconsequences, solicited and importuned by impressions or observations, and transported by passions. Neither is the nature of man so unfortunately built, as that those powers and arts should have force to disturb reason, and not to establish and advance it. For the end of logic is to teach a form of argument to secure reason, and not to entrap it; the end of morality is to procure the affections to obey reason, and not to invade it; the end

of rhetoric is to fill the imagination to second reason, and not to oppress it; for these abuses of arts come in but ex oblique, for caution.

(3) And therefore it was great injustice in Plato, though springing out of a just hatred to the rhetoricians of his time, to esteem of rhetoric but as a voluptuary art, resembling it to cookery, that did mar wholesome meats, and help unwholesome by variety of sauces to the pleasure