

HUMANISM AND THE SCIENTIFIC REVOLUTION: BACON'S REJECTION OF ARISTOTLE

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Seemingly out of favor today, Francis Bacon nonetheless stands as one of the patriarchs of the modern age. He lived as one of the triumvirate of great thinkers in the mind of Thomas Jefferson along with Newton and Locke, but then this was in the eighteenth century, after the French had canonized him.¹ In the seventeenth century his position was more ambiguous. His philosophy of science did not take into account mathematics as it would be used by Newton, and he was supremely confident of his ability to construct vast schemes of scientific knowledge; he was less scientist than philosopher of scientific improvement. The Royal Society of London took up his scheme of organization of scientific research.² Yet slightly earlier, despite his apparent lack of enthusiasm for religion, millenarian thinkers of the seventeenth century borrowed his utopian thought, and once they had formed him in a new image, left him behind.³ In the last century historians have found room for him both among Puritans in science, and among the capitalist entrepreneurs of the Calvinist age. He himself survived for a time in the high-church court of James I, and his *Essays* provide a unique commentary on courtly society and ways of surviving in it. Bacon in effect embodied merging streams of influence in the sixteenth and seventeenth centuries—yet the dominant tributaries are difficult to mark out. How did those merging streams contribute to the formation of Bacon's philosophy of science? To provide orientation for Bacon in his age, and consequently to provide an orientation for the age itself through one of its greater thinkers, we might look to his

¹ Herbert Butterfield, *The Origins of Modern Science, 1300-1800*, revised ed. (New York, 1965), pp. 108-109.

² Margery Purver, *The Royal Society: Concept and Creation* (Cambridge, MA, 1967), p. 101.

³ For the use of Bacon by different groups, notably the radical reformers of the seventeenth century and their adaption of his thought to their millenarianism, see Charles Webster, *The Great Instauration: Science, Medicine and Reform, 1626-1660* (New York, 1975), chaps. 1 and 2.

early life, up until about his fourteenth year when at Cambridge he rejected Aristotelianism and began his search for a new scientific way. As all of his biographers have exclaimed, this was the most important event of his life.

Bacon's first biographer, his personal secretary in his later years, Dr. William Rawley, summed up Bacon's early life in two short paragraphs. His editor, James Spedding, expanded the treatment of this part of his life to five pages. Both mentioned the influence of his mother and father, and his years at Trinity College, Cambridge. Spedding added that little is known of the particular circumstances surrounding his upbringing and schooling. No letters survive, nor did Bacon himself reveal much about his early life. He gave Dr. Rawley only one hint that has come down to the present day about the circumstances of his early development. Upon that hint subsequent biographers have built their interpretations of the significance of Bacon in the intellectual history of the West. And, accepting that hint, they have left primary questions concerning Bacon's early development and his place in the culture of his time unasked.

According to Dr. Rawley,

Whilst he was commorant in the university, about sixteen years of age, as his lordship hath been pleased to import unto myself, he first fell into the dislike of the philosophy of Aristotle: not for the worthlessness of the author, to whom he would ever ascribe all high attributes, but for the unfruitfulness of the way; being a philosophy, (as his lordship used to say) only strong for disputations 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.⁴

Spedding expanded Rawley's information, concluding that once the thought had struck him—the thought about the unfruitfulness of the way—Bacon concluded that the method must have been wrong. From that point on he had a vocation, “an object to live for as wide as humanity, as immortal as the human race; an idea to live in vast and lofty enough to fill the soul forever with religious and heroic aspirations.”⁵ The idea of the improvement of mankind through the practical works of science, and the attempt to construct a new method of acquiring knowledge became Bacon's calling and dream.

Spedding also attempted to put Bacon's early life and the influences on

⁴ In *The Works of Francis Bacon*, ed. James Spedding, et. al., 15 vols. (London, 1889), I, p. 4. Hereafter cited at *Works*.

⁵ *Ibid.*, VIII, p. 4.

him in perspective. His mother must have instilled in her son zeal for reformed religion. His father must have brought him up for public service, and given him his first notions of improvement through industry. These three great ideas remained in Bacon, and were developed by him according to his own genius.⁶ Spedding also attempted to put his education into perspective in the sixteenth century. He said,

It seemed that towards the end of the sixteenth century men neither knew nor aspired to know more than was to be learned from Aristotle; a strange thing at any time; more strange than ever just then, when the heavens themselves seemed to be taking up the argument on their own behalf and by suddenly lighting up within the very regions of the unchangeable and Incorruptable . . . to be protesting against the cardinal doctrine of the Aristotelian philosophy.⁷

Spedding's Bacon, alone at the end of an age of philosophical darkness, saw through the errors of the former age to the way of the age to come.

A more recent biographer of Bacon, Charles Williams, concluded that while at Cambridge Bacon fell in love, and that love was the hatred of Aristotle.⁸ He continued the panegyric begun by Rawley and developed by Spedding concerning the young Bacon's unique insight. Bacon, he said, also fell in love with the universe, with the particularities of space and time, and "the thing possessed him. The thing that was—fact—as distinct from words; the thing that was to be—knowledge—as distinct from fables; the thing that was to say it—truth—as distinct from argument."⁹ Williams saw Bacon's new idea as the combination of an intellectual and emotional attachment. Bacon saw the world of fact, knowledge, and truth in terms of the material world. Williams, like his earlier biographer pointed to that element of thought that would be the essence of his new method and goal of human knowledge. But, if these presentations of the event shed light on the character of Bacon's later thought and the use of his thought by others, they tell little of the reasons for his rejection of the Aristotelian way. Williams continued the story begun by Rawley and Spedding without asking whether Bacon's rejection deserved

⁶ *Ibid.*, VIII, p. 5.

⁷ *Ibid.*, VIII, pp. 3-4.

⁸ Charles Williams, *Bacon* (London, 1933), p. 7. If not always accurate in his historical works, Williams is always sure to get to the heart of the matter with striking phrase.

⁹ *Ibid.*, p. 10.

the praise and esteem the earlier two had given it. None asked why a boy of fourteen (not sixteen as Rawley surmised) would criticize the supposed prevailing conception of education and learning, reject it, and enter the search for a new method and ideal.

In his rejection of Aristotle Bacon substituted a new philosophical end for that which had arisen out of antiquity and continued in the speculations of the high Middle Ages. He abandoned the outlook which found man's perfection in either an intellectual or ecstatic union with the Divine. In his *New Organon* Bacon gave a few hints about the nature of his abandonment of the older outlook. While discussing his "Idols of the Theater," the errors of philosophical systems, he singled out Aristotle as one who "corrupted natural philosophy by his logic: fashioning the world out of categories." His physics was only a logical treatise like his metaphysics. As for his fame as a biologist,

Nor let any weight be given to the fact, that in his books on animals and his problems, and other treatises, there is a frequent dealing with experiments. For he had come to his conclusions before; he did not consult experience, as he should have done, in order to the framing of his decisions and axioms; but having first determined the question according to his will, he then resorts to experience, and bending her into conformity with his placets leads her about like a captive in a procession.¹⁰

Whether or not Aristotle used experiments, and whether or not Bacon's experiments were any less controlled by preconceived questions than Aristotle's are difficult problems which, for our purposes, we need not discuss. But Bacon still has pointed here to the essential difference between his own scientific works and the Aristotelian tradition. In the first book of his *On the Parts of Animals*, Aristotle defended and explained the purposes of his scientific remarks. He explained that "the principal object of actual philosophy is not the material elements, but their composition, and the totality of the form, independently of which they have no existence." A little earlier Aristotle had defined the "form" of a living thing to be the soul of that thing, its essence.¹¹ By knowing the parts and nature of animals, their forms,

¹⁰ Francis Bacon, *The New Organon*, in *Selected Writings*, from Speddings Works, by Hugh G. Dick (New York, 1955), Book I, LXIII.

¹¹ Aristotle, *On the Parts of Animals*, in *The Basic Works of Aristotle*, ed. Richard McKeon (New York, 1941), I, 1, 641a.

each and all will reveal to us something natural and something beautiful. Absence of haphazard and conduciveness of everything to an end are to be found in Nature's works in the highest degree, and the resultant end of her generations and combinations is a form of the beautiful.¹²

For Aristotle, then, natural science had this end. From material parts, the scientist proceeded to the form or essence of the animal, and this revealed the order of reality, "by disclosing to intellectual perception the artistic spirit that designed them."¹³ Bacon was characteristically blunt and insightful when he revised the order and end of Aristotle's program.

The human understanding is of its own nature prone to abstractions and gives a substance and reality to things which are fleeting. But to resolve nature into abstractions is less to our purpose than to dissect her into parts; as did the school of Democritus, which went further into nature than the rest. Matter rather than forms should be the object of our attention, its configurations and changes of configurations, and simple action, and law of action or motion; for forms are figments of the human mind, unless you will call those laws of action forms.¹⁴

The examination of matter and laws of action would bring useful knowledge rather than objects of contemplation. And in fact, this useful knowledge is the sign of true science. "Truth, therefore, and utility are here the very same things: and works themselves are of greater value as pledges of truth than as contributing to the comforts of life."¹⁵ As Dr. Rawley said Bacon rejected Aristotle because of the unfruitfulness of the way. That rejection had a religious connotation for Bacon as Spedding inferred; it may have been part of an emotional attachment as Williams concluded. Whatever the exact connection in his mind, Bacon postulated a new end for the intellectual activity of the human being. Rather than search for the metaphysical knowledge of causes, for the purposes and goals of life, Bacon sought for usefulness. And, as he told Rawley, he came to the search while still young. Though place must be kept for the working of his own genius, more recent biographers have sought to put Bacon more clearly within his age.

¹² *Ibid.*, I, 5, 645a.

¹³ *Ibid.*

¹⁴ Bacon, *New Organon*, Bk. I, LI.

¹⁵ *Ibid.*, Bk. I, CXXIV.

In a short essay published only three years ago, Anthony Quinton went only so far as to outline the different intellectual traditions at work in England during Bacon's early years: nominalism, the Reformation from Wycliffe through Calvin, the technological developments of the later Middle Ages and Renaissance, and the Northern Humanism of Erasmus More, and others.¹⁶ He mentioned the circumstances of his family and education, but neither outline nor mention are explanation. Benjamin Farrington, a few years earlier, treated the matter more completely. As young as Bacon was, the idea must have come from home, he said. His mother was one of the most highly educated women of her day, and one of the leading ladies of the Puritan wing of the Elizabethan Church. He conjectured that there must have been prayer regularly at home, a Calvinist home. And he linked this to R. K. Merton's studies on the predominance of Puritans in the scientific activities of the seventeenth century.¹⁷ His father was Lord Keeper and later Lord Chancellor in Queen Elizabeth's court, and an ardent enthusiast of the new productions and building that followed in the wake of the English Reformation. One of his father's mottos, *Moniti Meliora* (instruction brings progress), hung on the wall above the fireplace in the dining room of Francis's childhood home. Francis was later to use it in *The New Organum*; aphorism number 129.¹⁸ Thus from a Calvinist mother and an Anglican father, Bacon, for Farrington the greatest born of his age, took the best he found in his early life and blended it with the new technologies he found at the university of Paris in his years following Cambridge. Out of this mixture developed his new method and goal—he became the philosopher of the industry. According to Farrington, Bacon gained from Geneva an enthusiasm for the sanctity of the active life; from Geneva and his father he gained a reforming attitude that left the ignorance of scholastic learning behind. To this he added the new technologies and concluded that “the sovereignty of man lieth in his knowledge.”¹⁹

Farrington improved upon the explanation of that event which Spedding deemed the most important of his life, the rejection of the Aristotelian way. He developed it out of the earlier biographies, noting and expanding the influence of his mother and father, and his education at Cambridge. And given the lack of information, there seems to be no other course to follow. But in following that course, Farrington, like the others, kept at a distance

¹⁶ Anthony Quinton, *Francis Bacon* (New York, 1980), chap. 2.

¹⁷ Benjamin Farrington, *Francis Bacon: Philosopher of Industrial Science* (New York, 1949), p. 27.

¹⁸ *Ibid.*, p. 25.

¹⁹ *Ibid.*, p. 34.

from Bacon himself, and for the most part from his parents. He noted that Bacon was known to be precocious even by Queen Elizabeth. But even precociousness may, at the age of fourteen, fail to combine the general influences of father, mother, and schooling, and conclude with a rejection of the old and begin a search for the new. Farrington began his biography with the conclusion that "The story of Francis Bacon is that of a life devoted to a great idea. The idea gripped him as a boy."²⁰ Is there not more to be said of the way the intellectual climate of his day worked in the particular circumstances of his life to form the background for his rejection and new creation? And assuming there is something new to be unearthed, or at least newly synthesized, what can be said of the nature of Bacon's rejection? Given the self-proclaimed uniqueness of Bacon's new method, and given the circumstances behind his rejection of the old, must we conclude that that rejection was also unique?

As Spedding noted, lack of information presents the particular difficulty of the biography of Bacon's early life. His earliest surviving writing is a letter of his twentieth year. Spedding could only vaguely conclude, "He had been born among great events, and brought up among persons who had to deal with them."²¹ But nothing in his first sixteen years distinguished him. The Queen called him her young Lord Keeper, but nothing at Cambridge distinguished him as having extraordinary scholastic abilities. The only recourse is to work through the associations of his early life, as his biographers have done, hoping to define them more precisely and describe them more clearly.

Francis and his brother Anthony were educated at home before being sent to Cambridge in 1573, Francis's twelfth year. His mother was known for her learning, and because of that she has been assumed to have been her son's tutor. She assuredly was capable. She was the daughter of Sir Anthony Cooke, who was the tutor of Edward VI, and she may have acted as governess to Edward.²² She knew Latin, Greek, French, and Italian. Her 1564 translation of Bishop John Jewel's *Defense of the English Church* became the standard English translation of that first defense of the English Reformation, accepted by Jewel himself with no corrections. Only one reference remains of the boys' early education at home. An obscure English priest, John Walshall, the preacher of one published sermon of no great distinction, dedicated his one publication to Lady Anne Bacon. He said that he had been

²⁰ *Ibid.*, p. 3.

²¹ *Works*, VIII, p. 1.

²² See *The Dictionary of National Biography*, ed. Leslie Stephen and Sidney Lee (Oxford since 1917), I.

called from the university to teach her sons. He claimed her sons had a true fear of God, zealous affection for His word, were obedient to their parents, revered their superiors, were humble before their inferiors, and loved their instructor. Little else is known of him. He may have been chaplain to Sir Nicholas Bacon, the boys' father; he may have been in the Bacon household from the time Francis was five until he was eight.²³

Whatever the extent of the boys' formal tutelage, the influence of their mother directly or indirectly must have been great. Walshall's explanation of their character even as it presents an idealized picture, reveals the ideals that would have been acceptable to Lady Bacon. In her later years she was known as one of the most important Puritan women in England, and to have leaned towards a more radical nonconformity. She has been described as the eternal matriarch, and, it is said, "on the whole, her sons stood it very well."²⁴ In her later years she wrote to her son Anthony "I trust you with your servants use prayer twice a day. . . . Your brother is too negligent herein."²⁵ At about the same time she wrote to Lord Burghley concerning the church, and said she had profited more by the private reading of the scriptures than she had by listening to sermons at St. Pauls over the preceding twenty years.²⁶ Towards the end of her life she seems to have degenerated into senility, her Protestantism degenerating as well. A house boy reported that she once, in those later years, hung a dog because it was owned by a Roman Catholic.²⁷

In her early years she was not so. Though she later became part of the more radical wing of the church, in the early years of the Reformation in England the divisions within the church were not always clear. She translated Jewel's *Defense*—Jewel who on his return to England after the reign of Mary lamented leaving not Calvin's Geneva, but the moderate regime of Bullinger's Zurich with the words "O Zurich! O Zurich! How much oftener do I think of thee than I ever thought of England when in Zurich."²⁸

²³ V. B. Heltzel, "Young Francis Bacon's Tutor," *Modern Language Notes* 63 (1948), pp. 484-485.

²⁴ M. St. Clare Byrne, "The Mother of Francis Bacon," *Blackwoods Magazine* 236 (1934), p. 758.

²⁵ *Ibid.*, p. 761.

²⁶ Mary Bradford Whiting, "The Learned and Virtuous Lady Bacon," *Hibbert Journal* 29 (1931), p. 279.

²⁷ Byrne, p. 769.

²⁸ Quoted in H. C. Porter, *Reformation and Reaction in Tudor Cambridge* (Cambridge, 1955), p. 87.

Through her translation Lady Anne Bacon took part in the early definition of the Anglican middle way, Jewel's treatise being a forerunner of Richard Hooker's *The Laws of Ecclesiastical Polity*. She belonged to a group of reformers, called by A. G. Dickens the "Prayer Book Puritans"; those who wished to purify the English church from Popery without instituting the radical reforms of Geneva.²⁹ Lady Bacon also translated five sermons of the Italian and Capuchian convert to Protestantism Bernardino Ochino. Ochino, admired by Queen Elizabeth, wrote against both Rome and Geneva, having fled Rome during the tightening of control by the Roman Church over the Catholic Lutherans in the 1540's.³⁰ In these earlier years she lived in the mainstream of Protestant thought and belief in England.

About the time of Francis's birth in 1561, Anne Bacon was not committed to one side of a supposed split between Anglicans and radical Puritans in the English Church. Farrington may have been correct when he said that she was a Calvinist in theology. But most of the English clergy were Calvinist at this time, and they did not therefore set themselves apart from the Anglican church. They were the leaders of the Anglican church of the Elizabethan settlement.³¹ Farrington, however, laid great stress on the effect of Calvinism on the young Bacon through his mother Anne. He said it was partly known and partly conjectured that in Elizabethan England, during the first ferment of Protestantism, that the reformers rooted religion in the home, rather than in public worship. Thus we may be sure there was prayer and Bible reading in the Bacon home.³² The ideal of a spiritual practice of religion was certainly there. Walshall's sermon says as much, as did the subject matter of Ochino's sermons, all of which spoke of personal faith. But a close look at Anne Bacon's development does not give weight to these conjectures. When Queen Mary, a Catholic, first came to the throne in 1553, Nicholas, who had just married Anne, was surprised to find her sitting with Mary as one of the gentlewomen of the Privy Chamber.³³ And this she did even though at the same time her father fled to the continent, and her husband was known to have participated in the Reformation under Henry VIII, and the government of Edward VI. Between 1553 when Mary came to the throne, and 1583

²⁹ A. G. Dickens, *The English Reformation* (London, 1977), p. 398.

³⁰ A. G. Dickens, *The Counter Reformation* (London, 1977), p. 38. And A. G. Dickens, *The English Reformation*, pp. 319, 402.

³¹ Dickens, *The English Reformation*, pp. 426-436.

³² Farrington, pp. 21-22.

³³ Alan Simpson, *The Wealth of the Gentry, 1540-1660* (Cambridge, 1961), pp. 42-43.

when she wrote her letter to Burghley, Lady Bacon's religious ideas developed from the liberal willingness to adapt to the religion of the ruler, to the end where she would question one of the most powerful ministers of state regarding religious practice.³⁴ In 1553 she was willing to adapt herself to Catholic rule; in 1564 she took part in the definition of the Anglican middle way; by 1583 she would question Lord Burghley. Rawley desired to explain that Francis received his zeal for nonconformity from his mother, despite the fact that Francis Bacon seems to have had little if any zeal for religion. Bacon's later biographers have desired to explain his intellectual development from his early training in Calvinism, despite the absence of clear indications of this influence. That Lady Bacon provided a Protestant home for her sons cannot be doubted. That specifically Calvinist influences through Lady Bacon directly contributed to Francis's rejection of Aristotle must be doubted. Her translations of Jewel and Ochino, and her ability to survive through the Marian reaction, place her in the indistinct world of early Anglicanism. Lady Bacon's very independence of mind may have contributed at least as much to the boy's intellectual outlook as did any supposed Calvinist influence. No doubt, Protestantism played some role in the development of the young boy's mind. But to assign the influence Farrington conjectured, and to link it with the Merton thesis about Puritans in science can only mislead.

The religious background of Nicholas Bacon presents the same picture. Concerning the time just prior to Mary's assumption, about 1550, "the nature of his convictions, is unknown. He may have been what he finally became, a Protestant at heart. But it is just as possible that he was still taking his religious opinions from those in authority, who happened for the time being to be Protestant."³⁵ Whatever his religious convictions, other characteristics of Sir Nicholas Bacon himself, and of his relationship with his son seem most important. He was known in the years after his death as a humanist and servant of the state to be emulated by future ministers.³⁶ After he had been sick once during the years of his marriage to Anne, he relished the time

³⁴ I am indebted to Elizabeth Wrigley of the Francis Bacon Library who during casual conversation first alerted me to this change in Anne Bacon. See also, Byrne, p. 760.

³⁵ Simpson, p. 40. On this later Calvinism see Robert Tittler, "The Political Activity of Sir Nicholas Bacon in the Reign of Elizabeth I, 1558-1579," Diss. New York University, 1971, p. 328. In the holdings of the Francis Bacon Library, Claremont, California.

³⁶ Elizabeth McCutcheon, *Sir Nicholas Bacon's Great House Sententiae*, English Renaissance Supplements #3, p. 2.

during his convalescence when they had read together her Tully and his Seneca.³⁷ "He was wise, as the sixteenth century understood the term: adjuring undue ambition, following the golden mean of his own motto (*Mediocria Firma*) [moderation endures], steeped in classics and law, experienced, prudent, practical and responsible."³⁸

Nicholas Bacon benefitted from the general and particular changes that took place in England during the reign of Henry VIII. He was the son of a sheep-reeve at the monastery of Bury St. Edmunds. He was educated at Cambridge where he entered the circle of the future administrators of England, Archbishop Parker, and Sir William Cecil; later he married the sister of Cecil's wife. From Cambridge he went to Greys Inn to study law, and thus entered one of the most useful professions of the age. He was appointed to the Court of Augmentations in the reign of Henry VIII, and helped to arrange for the sale or gifts of former monastery lands. By the age of thirty-six he owned a group of manors, and he continued the buying and selling of lands and building on them until the end of his life. In the reign of Edward VI he was appointed to the Court of Wards where he helped administer the king's rights and duties in wardship and marriage of minors. He equally benefitted from this later position.³⁹

Bacon has been known by historians chiefly for his unswerving dedication to Elizabeth, and his ability as her Lord Keeper and Lord Chancellor. Francis called him "plain and honest." Recently he has been studied in relation to the culture of the time through a manuscript in the form of a collection of Senecan sentences which were displayed on the walls of a gallery in his manor house at Gorhambury.⁴⁰ Even his collection of moral sentences is characteristic of the practicality and prudence that shaped his political life. He has also received attention through his relation to and influence on his son. Nicholas left his youngest son Francis with about £1200 at his death, but without other provisions or an estate. He was in the process of preparing an estate for Francis at his death, yet even without it his legacy was great. According to Paul Kocher, much in the Baconian scheme of education and practical improvement derives from Nicholas. Even toward the end of his life Francis appealed to the memory of his father. When he at last gained the title of Lord Chancellor under James I, he congratulated himself on following in his father's footsteps. Both in his political and legal theory, and his scientific

³⁷ Farrington, p. 21.

³⁸ McCutcheon, p. 4.

³⁹ Simpson, pp. 29-38.

⁴⁰ McCutcheon, pp. 40, 49.

philosophy he had a strongly paternalistic emphasis. Kocher concluded: "To his dying day Bacon never did really separate his father from himself in his own mind."⁴¹ Like that of Francis, the thought of Nicholas is somewhat enigmatic. Politically he was practical and efficient. His political thinking has been described as half Machiavellian.⁴² At the same time he developed schemes of practical improvement and reform. Though he held to his motto, *Mediocria Firma*, he also kept to that other motto, *Moniti Meliora*.⁴²

His scheme of education revolved for the most part around training future ministers of the state. In 1539 he drew up a plan for these ministers which included training in ancient and modern languages, diplomatic and general history, law, and practical training in foreign courts.⁴⁴ Later he would take part in the founding of a grammar school for preparation for entry into a school such as planned in 1539. And he would advocate the founding of such a school in London. He sympathized with a new codification of law which would do away with the Medieval accretions of the English Common Law. He said in one of the sentences of his house at Gorhambury, "Let the law be brief; let it order, not discuss."⁴⁵ In 1562 he proposed in Parliament that the laws of England be put in better order. In 1572 he drafted a plan for the codification of statute law. Francis proposed the same plan in 1593.⁴⁶ Francis was also sent to follow the pattern of education designed by his father. He attended Cambridge for two years, left before taking a degree, and upon leaving accompanied Sir Amias Paulet on a diplomatic mission to France. On his return, at the death of his father, he entered Greys Inn to study law.

Even the humanistic background of Nicholas Bacon had the same practical character. He began his career in the court of Henry VIII, in the cultural world which has been dominated by Erasmus, More and Colet. During this time the Spanish humanist Juan Luis Vives arrived from Spain as tutor to Catherine of Aragon's daughter Mary. Vives emphasized practical education

⁴¹ Paul Kocher, "Francis Bacon and His Father," *The Huntington Library Quarterly* 21 (1958), pp. 148-156.

⁴² Tittler, pp. 315-321.

⁴³ V. J. Barnard, "The Political Career of Nicholas Bacon," Thesis, University of Chicago, 1957, p. 34. In the holdings of the Francis Bacon Library.

⁴⁴ Paul Kocher, "Francis Bacon and the Science of Jurisprudence," in *Essential Articles for the Study of Francis Bacon*, ed. Brian Vickers (Hamden, CT, 1968), p. 168.

⁴⁵ McCutcheon, p. 89.

⁴⁶ David Ibbetson, "Law Reform in the Sixteenth Century: The Work of Sir Nicholas Bacon," (Corpus Christi College, Cambridge, 1979), pp. 7-8.

in contrast to the pietism of Erasmus or the courtly education of Sir Thomas Elyot's *The Boke Named the Governor*.⁴⁷ But even for this difference, Vives influenced the educational theory of the most influential Elizabethan writers on education, including Elyot, Richard Mulcaster, and Roger Ascham.⁴⁸ In 1581 Mulcaster described the tradition of education that had grown out of Vives and the humanists. He stated clearly, if inelegantly, the educational thought common among courtiers and ministers of state. Of the students, he said,

They be to be set to school to qualify themselves, to learn how to be religious and loving, how to govern and obey, how to forecast and prevent, how to defend and assail, and in short, how to perform that excellently by labor whereunto they are born but rudely by nature.⁴⁹

Nicholas Bacon performed his duties as minister of state in the atmosphere dominated by men of such mind. He shared in such thinking and action and impressed it upon his son. As his one Senecan sentence under the heading "Of Reason" said, "If you want to make everything subject to you, subject yourself to reason."⁵⁰ When Francis was sent to Cambridge, it was no accident that he would find the same atmosphere.

Bacon went up to Cambridge in 1573 in the middle of controversies concerning both religious doctrine and the prescribed structure of the university. He sat under John Whitgift, later Archbishop of Canterbury, who gained his position as Master of Trinity College, Henry VIII's foundation, partly through the influence of Nicholas Bacon.⁵¹ According to his own notebooks, Whitgift attempted to adapt the private education of the courtier described in Elyot's *The Governor* for use at the college.⁵² At this time the tutorial began to take the place of the lecture and disputation as the staple of academic instruction. Whitgift represented court humanism in its college form at Cambridge—Elyot's education with service as its end, for the nobility of whatever degree, institutionalized in the university.

Whitgift's mastership of Trinity and his vice chancellorship of Cambridge

⁴⁷ Carlos G. Norena, *Juan Luis Vives* (The Hague, 1970), p. 295.

⁴⁸ John M. Major, *Sir Thomas Elyot and Renaissance Humanism* (Lincoln, 1964), pp. 33, 145.

⁴⁹ In *Education in Tudor and Stuart England*, ed. David Cressy (New York, 1975), p. 14.

⁵⁰ McCutcheon, p. 69.

⁵¹ V. J. K. Brook, *Whitgift and the English Church* (London, 1957), p. 14.

⁵² Hugh Kearney, *Scholars and Gentlemen* (New York, 1970), p. 38.

both reflected his ideal as the tutor of young, prospective ministers. He was a Calvinist in doctrine and Anglican in practice, again a follower of the more moderate Reformed theologian Bullinger. Whitgift assigned Bullinger's *Decades* to be studied by young Anglican Pastors in 1586.⁵³ He practiced strict leadership and supervision as he pursued the ends Elyot had described. To Thomas Cartwright who complained about Whitgift's statutes of 1570 regulating university life, Whitgift replied, "A Master of a college . . . (the which example master Calvin doth use) hath a perpetual office: he is chief governor of the society; and all the members thereof owe duty and obedience to him as their head."⁵⁴ According to Paule's life of Whitgift, written in 1699, he was lean, severe and awe inspiring, and he ate with the boys "as well to have a watchful eye over the scholars and to keep them in a mannerly and awful obedience, as by his example to teach them to be contented with a scholar-like diet."⁵⁵ For all of this it does not appear that Bacon was dissatisfied with his life at Cambridge; he seems to have respected a disciplined intellectual approach, and his relationship with Cambridge remained good for his entire life.⁵⁶ The reason for his rejection of Aristotelianism while at Cambridge was the unfruitfulness of it. The only conclusion regarding Bacon's like or dislike of Cambridge that can be drawn from that initial statement to Rawley is that he, like many of his time, distrusted the over-emphasis on the study of Aristotle that had persisted in the university since medieval times.⁵⁷ At this very time Ramism was gaining adherents at Cambridge, notably in Thomas Cartwright, Whitgift's oftentimes opponent. Bacon equally rejected Ramism with its emphasis on dialectical associations.⁵⁸ During his study with Whitgift, Bacon participated in the dominant trend of education among courtiers and ministers of state, and he seems to have accepted and benefitted from it.

The statutes of 1570 prescribed Whitgift's program of education, and Bacon entered into that program three years later. At that time conflict

⁵³ *The Dictionary of National Biography*, XXI. See also J. T. McNeill, *The History and Character of Calvinism* (London, 1954), p. 71.

⁵⁴ Porter, p. 170.

⁵⁵ *Ibid.*, p. 173.

⁵⁶ See P. M. Dawley, *John Whitgift and the English Reformation* (New York, 1954), p. 79. And J. B. Mullinger, "The Relation of Francis Bacon, Lord Verulam with the University of Cambridge," *Proceedings of the Cambridge Antiquarian Society* No. 38, Vol. 9, no. 2 (1897), pp. 228-230.

⁵⁷ Kenneth Charleton, *Education in Renaissance England* (London, 1965), pp. 153-154.

⁵⁸ Kearney, pp. 98-99.

continued over the use of Aristotle in the university. The old tradition was not dead, nor had the new taken command. And it was not to take complete control even in the first half of the seventeenth century when the Anglican Church experienced a scholastic revival. According to the statutes of 1570, the first year of study was to be spent in rhetoric, reading Quintillian, Hermogenes or Cicero; the second and third years were spent in logic with Aristotle and Cicero; and the fourth year was the year of ethical and political philosophy, reading Aristotle, Plato or Pliny.⁵⁹ Whitgift's account books record the purchasing of the works of Aristotle, Plato and Cicero for Anthony and Francis Bacon.⁶⁰ Independent tutors found even more latitude than this loose plan of reading initially allowed, making changes according to their own tastes. Some went so far as to substitute Machiavelli or Bodin for Aristotle's *Politics* or *Economics*, themselves already substituting for the *Organon*.⁶¹ Scholars did not necessarily enter the colleges to take degrees. Like Bacon, who left after two years to continue his education in the service of a diplomat, many came to the university for practical learning, to gain some knowledge of letters, and to prepare themselves for the Inns of Court. The Bachelors degree was not then the terminal degree it is now. It was considered a introduction to broad fields of knowledge. Many who stayed to finish their degree were assumed to be willing to continue on to master their subject, to take a Master's degree. As those who sought a more useful education became more predominant, Cambridge changed from a community of scholars to which the young came to listen to lectures and disputations by the accomplished Masters, to an institution organized into colleges, designed specifically to educate the undergraduate. Even Bacon himself in his later years assumed it should remain as such, and should have auxiliary societies connected with it, such as the scientific community of his *New Atlantis*.⁶² Without too much exaggeration Mark Curtis concluded that by the second half of the sixteenth century Cambridge was flooded by the followers of Elyot, and Bacon and his father's plan were part of the same movement.⁶³

Perhaps the contents of the preceding paragraphs suggest enough to account for Bacon's rejection of Aristotle. All of the above seem positive

⁵⁹ Mark H. Curtis, *Oxford and Cambridge in Transition, 1558-1642* (Oxford, 1959), p. 85.

⁶⁰ R. L. Eagle, "Dr. Whitgift's Accounts for Francis and Anthony Bacon at Trinity, Cambridge," *Notes and Queries* 197 (1952), pp. 179-180.

⁶¹ Curtis, p. 119.

⁶² *Ibid.*, p. 227.

⁶³ *Ibid.*, pp. 123-125.

reasons why a boy of fourteen might come to reject the speculations of Aristotle and look for more practically fruitful ways of learning in his later life. But there may have also been negative reasons that exerted their influence on Bacon's active mind. Aristotle continued to be lectured upon despite the humanist and Ramist challenges. And as Spedding noted, during Bacon's time at Cambridge, a new star appeared in the sphere of Aristotle's perfect and Incorruptible. The new sciences were arguing against the Aristotelian tradition. In other places in Europe Aristotelianism may have taken on an extreme dogmatism of the type Galileo would have to argue against. In Cambridge, however, at least as regards Whitgift the opposite seems to have been the case. In the years just prior to Bacon's arrival in 1572, Whitgift lectured on logic and philosophy. Thomas Cartwright, then a fellow of Trinity, attended the lectures and challenged Whitgift's competence. He said, "you are better acquainted with the names of logic and philosophy than with any sound or substantial knowledge of them." Whitgift replied that if those who had required him to lecture on logic and philosophy had found his lectures ineffectual, they would not have offered and maintained his position.⁶⁴ Whitgift did not respond with a challenge to a disputation, nor did he respond as one who was an authority on the subject. He may have wanted simply to avoid a confrontation with the obstinate and argumentative Puritan, though he did not as a rule duck any confrontation with Cartwright whose fellowship he revoked, expelling him from Cambridge, and whom he argued against in the admonition controversies of later years. But Whitgift may also in this reply to Cartwright have revealed part of the attitude toward Aristotle among the followers of Elyot. Aristotelian philosophy may have been carried on by rote at Cambridge, in many cases taught by those humanist teachers who had not taken the time nor mustered the sympathy necessary to study it thoroughly.⁶⁵ In such a situation the proper response by a student who learned from the practice of his elders may have been that the study of it was unprofitable. In a place where it was lectured on by tradition only, with an implicit rejection, the perceptive student may have seen little reason for keeping the habit alive. Along with the antipathy between the humanists and the Aristotelians, Bacon may have seen that in the hands of the humanists, Aristotle was truly unfruitful.

Until his fourteenth year Francis Bacon lived in the intellectual world dominated by the institutions sketched above. His mother was a Protestant of Puritan leanings, had lived in both the Protestant and Catholic courts of

⁶⁴ Porter, p. 169.

⁶⁵ Charleton, pp. 145, 150-154.

England, and had participated in the formation of the Anglican middle way. His father was a humanist, lawyer and minister of the courts of England during that time of troubles and sometimes smooth change of power and doctrine, and his practical and reforming bent served the time well. His tutor was a follower of the practical humanistic idea of education as modified by Elyot, a Calvinist theologian, and a minister of the Anglican establishment who fully satisfied his queen.⁶⁶ Against those who attribute the most important influences on Bacon to Calvinism, Whitgift's controversies with the nonconformists who wished to establish the institutions of Geneva in England might suggest that the dominant influence was rather the humanism growing out of More, Erasmus and Vives as transmitted through Elyot, Sir Nicholas Bacon and Whitgift. We must remember that Calvinism was the dominant theological position of the period, accepted by Anglicans and more radical Puritans alike. Calvin himself was educated among the humanists of France. It might further be argued that the practical aspirations of many of his followers grew as much from their indirect association with the continuing humanist culture as it did from anything peculiar to Calvin himself. Bacon, in his rejection of Aristotle at the age of fourteen, if counted alone without his subsequent new method, reiterated a conclusion reached often before in the circle of his elders. What Spedding saw as the most important event of his life, may have been only the explicit statement of an implicit perception and denial he had seen in action throughout his life. Farrington concluded that the attitude must have come from his home where his practical father would have had books on the new sciences, and whose practical reforms would have influenced the boy. Thus disillusionment was inevitable on his arrival at Cambridge. Farrington knew that Bacon himself considered his new philosophy a product of his age, not of his own wit.⁶⁷ But Bacon's rejection was no disillusionment; he never had the chance of the supposed illusion of metaphysical knowledge. Bacon was well equipped to fall into an easy dislike of the philosophy of Aristotle. His upbringing in the humanist circles of England provided that equipment.

The conclusions of this paper may very well support the thesis that both the early modern science and capitalism that grew up in Calvinist and more broadly Protestant countries did so not out of anything peculiar to those countries. Perhaps, according to H. R. Trevor-Roper, they became so aligned out of the hardening of the Roman Church in its attitude toward

⁶⁶G. R. Elton, *England Under the Tudors*, 2nd ed. (London, 1974), p. 407.

⁶⁷Farrington, p. 29.

the entrepreneurs and scientists who consequently fled north.⁶⁸ We may also link our conclusions concerning Bacon's background to the work of Paul Kocher on Elizabethan science. Heinrich Bullinger's name has come up twice in the preceding discussion, and it was to Bullinger that Kocher appealed to find the common religious assumptions of Elizabethan science. According to Bullinger,

The judgment and understanding of man in earthly things is not altogether none at all; but yet it is weak and very small, God wot. The understanding therefore that is in man doth come from God: but in that it is small and weak, that cometh of man's own fault and corruption. But the bountiful Lord doth augment in men those gifts of him; whereby it cometh that man's wit bringeth wonderful things to pass. . . . But in the knowledge and understanding of heavenly matters there is not one small spark of light in man.⁶⁹

This was the Bullinger that Whitgift assigned as study material to his Anglican ministers. Kocher could find no difference between Anglican, Puritan, or Catholic theology before around 1610 that made any of the three positions more conducive than the others to scientific thought. He concluded, "What we are witnessing here is the growth of a tradition which was to leave open a strong place for science in Elizabethan theology whether Anglican or Puritan."⁷⁰ This was certainly a position that the English Humanists could accept. It offered the chance of practical improvements, and carefully allowed the superiority of religion, while not confuting the two, as Bacon would later advocate.⁷¹ Since we know that the thinkers who accepted this position developed their educational practice and theory along humanist lines prior to that acceptance, we ought to look to the themes of the humanist educators for the roots of Bacon's rejection of Aristotle and foundation of his new scientific idea. We have seen that practical educational ideal

⁶⁸ For this argument see H. R. Trevor-Roper, *The Crisis of the Seventeenth Century: Religion, the Reformation and Social Change* (New York, 1968), p. 42, n. 1. For some earlier background, see Lynn White, Jr., "The Iconography of *Temperantia* and the Virtuousness of Technology," in *Action and Conviction in Early Modern Europe*, ed. T. K. Rabb and J. E. Seigel (Princeton, 1969).

⁶⁹ Paul Kocher, *Science and Religion in Elizabethan England* (San Marino, 1953), pp. 35-36.

⁷⁰ *Ibid.*, pp. 4, 17, 36.

⁷¹ Bacon, *The New Organon*, Bk. I, LXV.

already as regarded service to the commonwealth. But the practical technological and scientific ideal that made Bacon, in Farrington's terms, the philosopher of industry are equally evident in the humanistic educational ideals that dominated England. Vives, in his *Fable About Man*, graphically illustrated that characteristic of humankind that stood out above all others. The human being's uniqueness is surely his knowledge of religion, but the gods of Jupiter's court marvelled most of all at his

mind full of wisdom, prudence knowledge, reason, so fertile that by itself it brought forth extraordinary things. Its inventions are: towns and houses, the use of herbs, stoves and metals, the designations and names of all things, which foremost among his other inventions have especially caused wise men to wonder.⁷²

Bacon's similarity with Vives has been noted before and we may conclude that this was no accident. Our research into the early life of Bacon confirms Antonia McLean's conclusion that the English Protestant attitudes towards science and reform grew out of the early English humanists of the court of Henry VIII: More, Erasmus, Vives.⁷³

Paolo Rossi linked Bacon's technological philosophy with the humanists More, Erasmus and Vives through Bacon's association with the potter Bernard Palissy in Paris, after his years at Cambridge. Carlos Norena, a scholar of Vives, concluded that Vives' ideas were transmitted also by Telesio with whose works Bacon was familiar later in his life.⁷⁴ Whatever these later connections were, the humanistic connection of his early life was much more intimate and fundamental in Bacon's rejection and new philosophy. Bacon took with complete consistency the humanist position, and developed it along new lines. Cambridge confirmed the ideas already ingrained within him, but it would take many years, and much more experience before he would unfold his new philosophical way. We need not ignore Bacon as one who made an attempt at a scientific philosophy and failed. Nor need we praise him as the first herald of a new era. After all we already have Sir Thomas

⁷² Juan Luis Vives, *A Fable About Man*, trans. Nancy Lenkeith, in *The Renaissance Philosophy of Man*, ed. E. Cassirer, et. al. (Chicago, 1948), p. 392.

⁷³ Antonia McClean, *Humanism and the Rise of Science in Tudor England* (New York, 1972), pp. 54, 55, 69.

⁷⁴ Paolo Rossi, *Philosophy, Technology and the Arts in the Early Modern Era*, trans. S. Attanasio, ed. B. Nelson (New York, 1970), pp. 1-3. Norena, p. 240.

More whose Utopians were simply unable to see the universals that the older scholastic philosophy required, but whom he could praise for their technological advances. In the humanist background we might find some of the reasons behind these new habits of thought and speech that have become the perceptions of our modern culture and intellect. Herbert Butterfield in *The Origins of Modern Science* attempted to reach to the bottom of a thing so fundamental as the rejection of a thinker who has dominated the thought of Europe for centuries. He reasoned,

It may not be easy to say why such a thing should have happened, but men unconsciously betray the fact that a certain Aristotelian thesis simply has no meaning for them any longer—they just cannot think of the stars and heavenly bodies as things without weight even when the book tells them to do so. Francis Bacon seems unable to say anything except that it is obvious that these heavenly bodies have weight, like any other kind of matter which we meet in our experience. Bacon says, furthermore, that he is unable to imagine the planets as nailed to crystalline spheres; and the whole idea only seems more absurd to him if the spheres in question are supposed to be made of that liquid, ethereal kind of substance which Aristotle had in mind. Between the idea of a stone aspiring to reach its natural place at the center of the universe—and rushing more fervently as it comes nearer home—and the idea of a stone accelerating its descent under the constant force of gravity, there is an intellectual transition which involves somewhere or other a change in men's feelings for matter.⁷⁵

In Francis Bacon's rejection of Aristotle we witness the recognition of that intellectual transition. When at the age of fourteen he voiced his rejection of Aristotle he recognized and participated in one of the fundamental intellectual movements of his day. To understand what made Bacon one of the symbols of the modern outlook, we might look back to his intellectual origins in English humanism.

⁷⁵ Butterfield, pp. 130-131. See also Owen Barfield's discussion of Butterfield's observation in *Saving the Appearances* (New York, n.d.), pp. 92-95.

Stephen Varvis is presently working on a doctoral dissertation on Boethius' *The Consolation of Philosophy*, applying methods of analysis from the history of consciousness to discuss the question of Boethius' religious affiliation and the lack of Christian teaching in *The Consolation*. His specialties are the cultural and intellectual histories of the Middle Ages and the Renaissance/Reformation periods. He has recently presented a paper, "Allegory, History, and Christendom in *Piers Plowman*," to the Medieval Association of the Pacific, and has taught part-time at Harvey Mudd College, Claremont. In the coming year he will be teaching part-time in Fresno, while doing what all young academics now do—working in computer software.