

Chapter 1 : Francis Bacon (Stanford Encyclopedia of Philosophy)

Francis Bacon was born on January 22, in London, England. Bacon served as attorney general and Lord Chancellor of England, resigning amid charges of corruption. His more valuable work was.

Early life[edit] The young Francis Bacon. Inscription around his head reads: Si tabula daretur digna animum mallem, Latin for "If one could but paint his mind". He received tuition from John Walsall, a graduate of Oxford with a strong leaning toward Puritanism. He entered Trinity College, Cambridge , on 5 April at the age of 12, [9] living for three years there, together with his older brother Anthony Bacon under the personal tutelage of Dr John Whitgift , future Archbishop of Canterbury. He was also educated at the University of Poitiers. It was at Cambridge that he first met Queen Elizabeth , who was impressed by his precocious intellect, and was accustomed to calling him "The young lord keeper". His reverence for Aristotle conflicted with his rejection of Aristotelian philosophy , which seemed to him barren, disputatious and wrong in its objectives. A few months later, Francis went abroad with Sir Amias Paulet , the English ambassador at Paris, while Anthony continued his studies at home. The state of government and society in France under Henry III afforded him valuable political instruction. On at least one occasion he delivered diplomatic letters to England for Walsingham , Burghley, and Leicester , as well as for the queen. Sir Nicholas had laid up a considerable sum of money to purchase an estate for his youngest son, but he died before doing so, and Francis was left with only a fifth of that money. He sought to further these ends by seeking a prestigious post. In , through his uncle, Lord Burghley , he applied for a post at court that might enable him to pursue a life of learning, but his application failed. In he took his seat in parliament for Melcombe in Dorset, and in for Taunton. At this time, he began to write on the condition of parties in the church, as well as on the topic of philosophical reform in the lost tract *Temporis Partus Maximus*. Yet he failed to gain a position that he thought would lead him to success. About this time, he again approached his powerful uncle for help; this move was followed by his rapid progress at the bar. He became a bencher in and was elected a Reader in , delivering his first set of lectures in Lent the following year. He later sat three times for Ipswich , , and once for Cambridge University. Though a friend of the crown, he opposed feudal privileges and dictatorial powers. He spoke against religious persecution. He struck at the House of Lords in its usurpation of the Money Bills. He advocated for the union of England and Scotland, which made him a significant influence toward the consolidation of the United Kingdom; and he later would advocate for the integration of Ireland into the Union. Closer constitutional ties, he believed, would bring greater peace and strength to these countries. Likewise, Bacon failed to secure the lesser office of Solicitor General in , the Queen pointedly snubbing him by appointing Sir Thomas Fleming instead. In a plan to revive his position he unsuccessfully courted the wealthy and young widow Lady Elizabeth Hatton. Gradually, Bacon earned the standing of one of the learned counsels. And also that "he was free from malice", "no revenger of injuries", and "no defamer of any man". He was knighted in . In another shrewd move, Bacon wrote his *Apologies* in defence of his proceedings in the case of Essex, as Essex had favoured James to succeed to the throne. The following year, during the course of the uneventful first parliament session, Bacon married Alice Barnham. Despite a generous income, old debts still could not be paid. He sought further promotion and wealth by supporting King James and his arbitrary policies. Sir Francis Bacon, c. The House was finally dissolved in February. Throughout this period Bacon managed to stay in the favour of the king while retaining the confidence of the Commons. In Bacon was finally appointed attorney general , after advising the king to shuffle judicial appointments. As attorney general, Bacon, by his zealous effortsâ€”which included tortureâ€”to obtain the conviction of Edmund Peacham for treason, raised legal controversies of high constitutional importance; [33] and successfully prosecuted Robert Carr, 1st Earl of Somerset , and his wife, Frances Howard, Countess of Somerset , for murder in . Although he was allowed to stay, parliament passed a law that forbade the attorney general to sit in parliament. His influence over the king had evidently inspired resentment or apprehension in many of his peers. After he fell into debt, a parliamentary committee on the administration of the law charged him with 23 separate counts of corruption. His lifelong enemy, Sir Edward Coke , who had instigated these accusations, [34] was one of those appointed

to prepare the charges against the chancellor. He narrowly escaped undergoing degradation, which would have stripped him of his titles of nobility. Subsequently, the disgraced viscount devoted himself to study and writing. There seems little doubt that Bacon had accepted gifts from litigants, but this was an accepted custom of the time and not necessarily evidence of deeply corrupt behaviour. He even had an interview with King James in which he assured: The law of nature teaches me to speak in my own defence: With respect to this charge of bribery I am as innocent as any man born on St. I never had a bribe or reward in my eye or thought when pronouncing judgment or order I am ready to make an oblation of myself to the King" 17 April [38] He also wrote the following to Buckingham: My mind is calm, for my fortune is not my felicity. I know I have clean hands and a clean heart, and I hope a clean house for friends or servants; but Job himself, or whoever was the justest judge, by such hunting for matters against him as hath been used against me, may for a time seem foul, especially in a time when greatness is the mark and accusation is the game. He may even have been blackmailed, with a threat to charge him with sodomy, into confession. Bacon has been accused of servility, of dissimulation, of various base motives, and their filthy brood of base actions, all unworthy of his high birth, and incompatible with his great wisdom, and the estimation in which he was held by the noblest spirits of the age. It is true that there were men in his own time, and will be men in all times, who are better pleased to count spots in the sun than to rejoice in its glorious brightness. Such men have openly libelled him, like Dewes and Weldon, whose falsehoods were detected as soon as uttered, or have fastened upon certain ceremonious compliments and dedications, the fashion of his day, as a sample of his servility, passing over his noble letters to the Queen, his lofty contempt for the Lord Keeper Puckering, his open dealing with Sir Robert Cecil, and with others, who, powerful when he was nothing, might have blighted his opening fortunes for ever, forgetting his advocacy of the rights of the people in the face of the court, and the true and honest counsels, always given by him, in times of great difficulty, both to Elizabeth and her successor. When was a "base sycophant" loved and honoured by piety such as that of Herbert, Tennyson, and Rawley, by noble spirits like Hobbes, Ben Jonson, and Selden, or followed to the grave, and beyond it, with devoted affection such as that of Sir Thomas Meautys. He believed that philosophy and the natural world must be studied inductively, but argued that we can only study arguments for the existence of God. Information on His attributes such as nature, action, and purposes can only come from special revelation. But Bacon also held that knowledge was cumulative, that study encompassed more than a simple preservation of the past. Years later, Bacon still wrote of his regret that the marriage to Hatton had not taken place. Bacon wrote two sonnets proclaiming his love for Alice. The first was written during his courtship and the second on his wedding day, 10 May When Bacon was appointed lord chancellor, "by special Warrant of the King", Lady Bacon was given precedence over all other Court ladies. It was said that she was strongly interested in fame and fortune, and when household finances dwindled, she complained bitterly. Bunten wrote in her *Life of Alice Barnham* [45] that, upon their descent into debt, she went on trips to ask for financial favours and assistance from their circle of friends. Bacon disinherited her upon discovering her secret romantic relationship with Sir John Underhill. He subsequently rewrote his will, which had previously been very generous"leaving her lands, goods, and income"and instead revoked it all. Homosexuality[edit] Several authors believe that despite his marriage Bacon was primarily attracted to the same sex. His *Ganimeds and Favourites tooke Bribes*". In his *New Atlantis*, he described his utopian island as being "the chastest nation under heaven", and "as for masculine love, they have no touch of it". They were resolved they would try the experiment presently. After stuffing the fowl with snow, Bacon contracted a fatal case of pneumonia. Some people, including Aubrey, consider these two contiguous, possibly coincidental events as related and causative of his death: Being unwittingly on his deathbed, the philosopher wrote his last letter to his absent host and friend Lord Arundel: My very good Lord,"I was likely to have had the fortune of Caius Plinius the elder, who lost his life by trying an experiment about the burning of Mount Vesuvius; for I was also desirous to try an experiment or two touching the conservation and induration of bodies. As for the experiment itself, it succeeded excellently well; but in the journey between London and Highgate, I was taken with such a fit of casting as I know not whether it were the Stone, or some surfeit or cold, or indeed a touch of them all three. I know how unfit it is for me to write with any other hand than mine own, but by my troth my fingers are so disjointed with sickness that I cannot steadily hold a pen. At the news of his death, over 30 great

minds collected together their eulogies of him, which were then later published in Latin. Religious and literary works in which he presents his moral philosophy and theological meditations. Juridical works in which his reforms in English Law are proposed. This book entails the basis of the Scientific Method as a means of observation and induction. In Voltaire introduced him to a French audience as the "father" of the scientific method, an understanding which had become widespread by the 18th century. He has been reputed as the "Father of Experimental Philosophy". One of his biographers, the historian William Hepworth Dixon, states: North America[edit] A Newfoundland stamp, which reads "Lord Bacon the guiding spirit in colonization scheme" Bacon played a leading role in establishing the British colonies in North America, especially in Virginia, the Carolinas and Newfoundland in northeastern Canada. His government report on "The Virginia Colony" was submitted in 1609. In 1606 Bacon and his associates received a charter from the king to form the Treasurer and the Company of Adventurers and planter of the City of London and Bristol for the Colony or plantacon in Newfoundland, and sent John Guy to found a colony there. I consider them as the three greatest men that have ever lived, without any exception, and as having laid the foundation of those superstructures which have been raised in the Physical and Moral sciences". The stamp describes Bacon as "the guiding spirit in Colonization Schemes in 1609". As late as the 18th century some juries still declared the law rather than the facts, but already before the end of the 17th century Sir Matthew Hale explained modern common law adjudication procedure and acknowledged Bacon as the inventor of the process of discovering unwritten laws from the evidences of their applications. The method combined empiricism and inductivism in a new way that was to imprint its signature on many of the distinctive features of modern English society. Kocher writes that Bacon is considered by some jurists to be the father of modern Jurisprudence. Organization of knowledge[edit] Francis Bacon developed the idea that a classification of knowledge must be universal while handling all possible resources. In his progressive view, humanity would be better if the access to educational resources were provided to the public. Hence the need to organize it. His approach to learning reshaped the Western view of our knowledge theory from an individual to a social interest. The original classification proposed by Bacon organized all types of knowledge in three general groups:

Chapter 2 : Higher Education | Pearson

Francis Bacon discovered and popularized the scientific method, whereby the laws of science are discovered by gathering and analyzing data from experiments and observations, rather than by using logic-based arguments.

Lady Anne was highly erudite: Together with his older brother Anthony, Francis grew up in a context determined by political power, humanist learning, and Calvinist zeal. His father had built a new house in Gorhambury in the s, and Bacon was educated there for some seven years; later, along with Anthony, he went to Trinity College, Cambridge 1575, where he sharply criticized the scholastic methods of academic training. Their tutor was John Whitgift, in later life Archbishop of Canterbury. Whitgift provided the brothers with classical texts for their studies: According to Peltonen During his stay in France, perhaps in autumn 1578, Bacon once visited England as the bearer of diplomatic post, delivering letters to Walsingham, Burghley, Leicester, and to the Queen herself. When his father died in 1579, he returned to England. In 1584 he entered the Commons as a member for Cornwall, and he remained a Member of Parliament for thirty-seven years. His involvement in high politics started in 1586, when he wrote his first political memorandum, A Letter of Advice to Queen Elizabeth. Very early on he tried to formulate outlines for a new system of the sciences, emphasizing empirical methods and laying the foundation for an applied science *scientia operativa*. This twofold task, however, proved to be too ambitious to be realized in practice. Small expectations on this front led him to become a successful lawyer and Parliamentarian. From 1593 to the year he entered the House of Lords he was an active member in the Commons. He served on many committees, including one in which examined recusants; later he was a member of a committee to revise the laws of England. He was involved in the political aspects of religious questions, especially concerning the conflict between the Church of England and nonconformists. In 1597 a tract of 1597, he tried to steer a middle course in religious politics; but one year later he was commissioned to write against the Jesuit Robert Parson Jardine and Stewart 1598, p. From the late 1590s onwards, Bacon turned to the Earl of Essex as his patron. During this phase of his life, he particularly devoted himself to natural philosophy. He clearly expressed his position in a famous letter of 1598 to his uncle, Lord Burghley: I confess that I have as vast contemplative ends, as I have moderate civil ends: This, whether it be curiosity, or vain glory, or nature, or if one take it favourably philanthropia, is so fixed in my mind as it cannot be removed. Bacon 1598, VIII, In 1599 Bacon fell out favor with the queen on account of his refusal to comply with her request for funds from Parliament. Although he did not vote against granting three subsidies to the government, he demanded that these should be paid over a period six, rather than three, years. He was involved in the treason trial of Roderigo Lopez and later on in the proceedings against the Earl of Essex. Since he failed to secure for himself a position in the government, he considered the possibility of giving up politics and concentrating on natural philosophy. It is no wonder, then, that Bacon engaged in many scholarly and literary pursuits in the 1590s. His letters of advice to the Earl of Rutland and to the Earl of Essex should be mentioned in this context. The advice given to Essex is of particular importance because Bacon recommended that he should behave in a careful and intelligent manner in public, above all abstaining from aspiring to military commands. Bacon also worked in this phase of his career for the reform of English law. In 1600 his first book was published, the seminal version of his *Essays*, which contained only ten pieces Klein b. His financial situation was still insecure; but his plan to marry the rich widow Lady Hatton failed because she was successfully courted by Sir Edward Coke. In 1601 Bacon was unable to sell his reversion of the Star Chamber clerkship, so that he was imprisoned for a short time on account of his debts. Essex did not solve the Irish question, returned to court and fell from grace, as Bacon had anticipated he would. He therefore lost a valuable patron and spokesman for his projects. Bacon tried to reconcile the queen and Essex; but when the earl rebelled against the crown in 1601, he could do nothing to help him. The queen ordered Bacon to participate in the treason trial against Essex. He was knighted in 1603 and was created a learned counsel a year later. He took up the political issues of the union of England and Scotland, and he worked on a conception of religious toleration, endorsing a middle course in dealing with Catholics and nonconformists. Bacon married Alice Barnhem, the young daughter of a rich London alderman in 1606. One year later he was appointed Solicitor General. He was also dealing with theories of the state and

developed the idea, in accordance with Machiavelli, of a politically active and armed citizenry. In Bacon became clerk of the Star Chamber; and at this time, he made a review of his life, jotting down his achievements and failures. Though he still was not free from money problems, his career progressed step by step. In the period from to Bacon was not only busy within English politics. He also created the foundations of his philosophical work by writing seminal treatises which prepared the path for the *Novum Organum* and for the *Instauratio Magna*. In he became Attorney General and began the rise to the peak of his political career: In , however, Bacon, after being created Viscount of St Alban, was impeached by Parliament for corruption. In order to protect Buckingham, the king sacrificed Bacon, whose enemies had accused him of taking bribes in connection with his position as a judge. Bacon saw no way out for himself and declared himself guilty. His fall was contrived by his adversaries in Parliament and by the court faction, for which he was a scapegoat to save the Duke of Buckingham not only from public anger but also from open aggression Mathews He lost all his offices and his seat in Parliament, but retained his titles and his personal property. Bacon devoted the last five years of his life—the famous quinquennium—entirely to his philosophical work. He tried to go ahead with his huge project, the *Instauratio Magna Scientiarum*; but the task was too big for him to accomplish in only a few years. Though he was able to finish important parts of the *Instauratio*, the proverb, often quoted in his works, proved true for himself: *Vita brevis, ars longa*. He died in April of pneumonia after experiments with ice. Very early on he criticized not only Plato, Aristotle and the Aristotelians, but also humanists and Renaissance scholars such as Paracelsus and Bernardino Telesio. Although we find the debate with Telesio in an unpublished text of his middle period *De Principiis atque Originibus, secundum fabulas Cupidinis et Coelum* or *On Principles and Origins According to the Fables of Cupid and Coelum*, written in ; Bacon V [], “ , Bacon began to struggle with tradition as early as In *Valerius Terminus ?* Simultaneously Aristotle favors the application of general and abstract conceptual distinctions, which do not conform to things as they exist. Bacon, however, introduces his new conception of *philosophia prima* as a meta-level for all scientific disciplines. From to Bacon pursued his work on natural philosophy, still under the auspices of a struggle with tradition. Bacon rediscovers the Pre-Socratic philosophers for himself, especially the atomists and among them Democritus as the leading figure. Bacon does not expect any approach based on tradition to start with a direct investigation of nature and then to ascend to empirical and general knowledge. His criticism also concerns contemporary technical literature, in so far as it lacks a new view of nature and an innovative methodological program. Bacon takes to task the ancients, the scholastics and also the moderns. Like a bee, the empiricist, by means of his inductive method, collects the natural matter or products and then works them up into knowledge in order to produce honey, which is useful for healthy nutrition. But in the same text he sharply criticizes his contemporary Telesio for propagating a non-experimental halfway house empiricism. According to Bacon, the human mind is not a *tabula rasa*. Instead of an ideal plane for receiving an image of the world in toto, it is a crooked mirror, on account of implicit distortions Bacon IV [], “ He does not sketch a basic epistemology but underlines that the images in our mind right from the beginning do not render an objective picture of the true objects. Consequently, we have to improve our mind, i. As early as *Temporis partus masculus*, Bacon warns the student of empirical science not to tackle the complexities of his subject without purging the mind of its idols: On waxen tablets you cannot write anything new until you rub out the old. With the mind it is not so; there you cannot rub out the old till you have written in the new. Farrington , 72 In *Redargutio Philosophiarum* Bacon reflects on his method, but he also criticizes prejudices and false opinions, especially the system of speculation established by theologians, as an obstacle to the progress of science Farrington , , together with any authoritarian stance in scholarly matters. In his paragraph on judgment he refers to proofs and demonstrations, especially to induction and invention. There is no finding without proof and no proof without finding. But this is not true for the syllogism, in which proof syllogism: The caution he suggests in relation to the ambiguities in elenches is also recommended in face of the idols: 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 “! Judgment by syllogism presupposes—in a mode agreeable to the

human mindâ€™mediated proof, which, unlike in induction, does not start from sense in primary objects. The reduction of propositions to principles leads to the middle term. Bacon deals here with the art of judgment in order to assign a systematic position to the idols. The complete doctrine of detection of fallacies, according to Bacon, contains three segments: Sophistical fallacies, Fallacies of interpretation, and False appearances or Idols. Concerning 1 Bacon praises Aristotle for his excellent handling of the matter, but he also mentions Plato honorably. He focuses his attention on the logical handling when he relates the detection of fallacies of interpretation to the wrong use of common and general notions, which leads to sophisms. In the last section 3 Bacon finds a place for his idols, when he refers to the detection of false appearances as the deepest fallacies of the human mind: For they do not deceive in particulars, as the others do, by clouding and snaring the judgment; but by a corrupt and ill-ordered predisposition of mind, which as it were perverts and infects all the anticipations of the intellect. In his Preface to the *Novum Organum* Bacon promises the introduction of a new method, which will restore the senses to their former rank Bacon IV [], 17f. These idols are due to the preconditioned system of every individual, comprising education, custom, or accidental or contingent experiences. They enter our minds quietly by a combination of words and names, so that it comes to pass that not only does reason govern words, but words react on our understanding. These systems resemble plays in so far as they render fictional worlds, which were never exposed to an experimental check or to a test by experience. The idols of the theatre thus have their origin in dogmatic philosophy or in wrong laws of demonstration. He discusses the idols together with the problem of information gained through the senses, which must be corrected by the use of experiments Bacon IV [], This meager result stimulated his ambition to establish a new system of the sciences.

Chapter 3 : Roger Bacon | Biography, Inventions and Facts

Roger Bacon, byname Doctor Mirabilis (Latin: "Wonderful Teacher"), (born c. , Ilchester, Somerset, or Bisley, Gloucester?, England" died , Oxford?), English Franciscan philosopher and educational reformer who was a major medieval proponent of experimental science.

His date of birth is estimated to be around or He was born in Somerset to a wealthy family during the reign of Henry III, when their property was seized and some of his family members were forced into exile. Bacon studied at Oxford and was thought to be a disciple of the English philosopher Robert Grosseteste. He returned to Oxford to become a lecturer on Aristotle. He later became a lecturer at University of Paris as Paris was then the intellectual capital of Europe. In he became a friar, and relinquished his teaching position. At that time, friars were prohibited from publishing books, so Bacon used his influence with Cardinal Guy le Gros de Foulques, who later became Pope Clement IV, to allow him to continue writing and publishing books and pamphlets. When the Pope passed away, Bacon lost his writing privileges and was even placed under house arrest for some time, the reason for which remains unknown. Bacon was thought to have had a variety of interests. He studied topics such as optics, and refraction of light, which led to the development of spectacles. He also worked to reform the traditional calendar and had a marked interested in astronomy. He also worked to reform the Julian Calendar, which he believed was inefficient. Bacon suggested to Pope Clement IV in to rectify the errors in the existing calendar by dropping one day in the calendar every years. He believed that Christians were celebrating holidays on the wrong days because the calendar was incorrect. The Pope considered his suggestions but his death put an end to this development. He was also the first European to research and propound his views about the ingredients of gunpowder. Some authors suggest that he was strongly opposed to the Medieval Church for which he was often victimized and even imprisoned. He advocated scientific methods of learning in an age where it was ill received and his ideas were treated with hostility. Some even suggest that he predicted the invention of the submarine, automobile, and airplane in the 13th century, at a time when such notions were not even heard or conceived of. Perception about Bacon has considerably changed with one study by Lindberg saying that Bacon was not a modern scientist but an eccentric scholar of the thirteenth century who capitalized on the early spread of knowledge but remained true to medieval notions prevalent at that time. Many scholars today are influenced by his views. Write About Roger Bacon.

Francis Bacon, 1st Viscount St Alban, PC QC (/ ˈ ɛ ː b ɛ ɛ ː k ɛ ɪ ˈ m ɪ n /; 22 January - 9 April) was an English philosopher, statesman, scientist, jurist, orator, and author. He served both as Attorney General and as Lord Chancellor of England.

Francis Bacon Rene Descartes It has been said that both modern philosophy and modern mathematics began with the work of Rene Descartes. His analytic method of thinking focused attention on the problem of how we know epistemology , which has occupied philosophers ever since. Descartes was educated at the renowned Jesuit school of La Fleche where he was taught philosophy, science, and mathematics. He earned a law degree and then volunteered for the military in order to broaden his experience. When his duties allowed he continued his studies in mathematics and science. Eventually he became dissatisfied with the unsystematic methods utilized by the previous authorities in science, since he concluded they had not "produced anything which was not in dispute and consequently doubtful" 1, p. The only exception to this was in the field of mathematics which he believed was built on a "solid foundation" 1, p. Medieval science, on the other hand, was largely based on authorities from the past rather than observations in the present, therefore Descartes decided to conduct a personal plan of investigation. But, for Descartes, even his personal observation of the "book of nature" 1, p. Descartes aspired to rebuild a new system of truth based upon an unquestionable first principle which, like the fulcrum of Archimedes, would allow him to "move the earth from its orbit and place it in a new orbit" 2, p. The first principle that he finally felt was self evident was summarized in the statement, "I think, therefore I am" 1. Descartes believed that he could then use his new method of reasoning to build on such a first principle, ultimately leading to the unification of all knowledge. The method developed by Descartes was based on the following rules 1, p. In short, his method required 1 accepting as "truth" only clear, distinct ideas that could not be doubted, 2 breaking a problem down into parts, 3 deducing one conclusion from another, and 4 conducting a systematic synthesis of all things. Descartes based his entire philosophical approach to science on this deductive method of reasoning. Descartes was highly optimistic about his plan to reconstruct a new and fully reliable body of knowledge. He even wondered if among "all things knowable to men" there might not be a proper application of his method so that "there cannot be any propositions so abstruse that we cannot prove them, or so recondite that we can not discover them" 1, p. In point of fact, he considered himself a good Catholic and with respect to the "truths of revelation" he clearly stated, "I would not have dared to Ultimately it was his religion that kept him from living in a cocoon of personal introspection. However, Descartes did plant the seeds for later dissent from the theistic view of the world allowing for the humanistic dependence on human reason alone. It was left to the humanists who followed to assert an all encompassing rationalism that would take human reason as the sole measure of what constitutes "truth. At the age of twelve Bacon went to study at Trinity College, Cambridge, later acquired an education in law, and was eventually admitted to the bar. He next embarked on a political career in the hope that it would allow him to advance his emerging ideas for the advancement of science. He gained fame as a speaker in Parliament and as a lawyer in some famous trials in which he was considered an expert on English constitutional law. An outstanding thinker, Bacon was motivated to write in areas as far-reaching as science and civil government in a battle against the old order of scholasticism with its slavish dependence on accepted authorities. He advocated the view that whatever the "mind seizes and dwells upon with particular satisfaction is to be held in suspicion" 3, p His passion for the advancement of natural philosophy was rooted in his belief that science was dependent on and the key to technological progress. Much of his greatest philosophical effort was applied to the *Novum Organum* in which he described the inductive method of reasoning for the interpretation of nature. Bacon was very critical of those in the scholastic tradition who jumped from a few particular observations to remote axioms, and then deduced intermediate axioms through syllogistic demonstration. He also took a dim view of those empiricists who had been side-tracked with experiments done in depth without reference to related phenomena, since they were unjustified in the breadth of their generalizations. According to Bacon there were four categories of false knowledge, or "idols," that had captured the minds of the men of his day. They are paraphrased as follows 3, pp. False notions due to the

human nature and common to all men. An example would be geocentricity which was due to the limits of human insight. Personal interpretations due to individual makeup or disposition. The problem of language and the confusion of words and terms. An example of this relates to the problem with definitions of words which likewise depend upon words. The dogmas of philosophies that are received from wrong "laws of demonstration. In contrast to these, Bacon said that a true science progressed "in a just scale of ascent, and by successive steps not interrupted or broken, we rise from particulars to lesser axioms; and then to middle axioms, one above the other; and last of all to the most general" 3, p. In short, his method required 1 accumulating a store of particular empirical observations, 2 from these inductively inferring lesser axioms, 3 from these inductively inferring middle axioms, 3 and then proposing the most general of notions, each in progressive steps. If we read modern meaning into the language used by Bacon, we might see a foreshadowing of the idea of a hypothesis in a "lesser axiom" and a theory in the "middle axiom. Bacon also argued that this inductive method "must be used not only to discover axioms, but also notions," which may be taken to correspond to the concept of a paradigm, but again this may be reading into the text. The radical commitment to empiricism advocated by Bacon may imply for some that he did not accept any knowledge that was not received by personal observation. Bacon actually saw his new way of acquiring knowledge as a fulfillment of Biblical prophecy concerning the last days: Further, he saw the technological advancement of science as a restoration of the "dominion mandate" Gen 1: Both of these losses however can even in this life be in some parts repaired; the former by religion and faith, the latter by the arts and sciences" 4, p. For those who later advocated a "scientific world view," this prediction was claimed to be fulfilled. Comparison and Contrast of the Methods of Descartes and Bacon The differences between the methods of Descartes and Bacon are many and deep, but there are also many things they have in common. Each of these pioneers advocated the complete overthrow of all the methods and most of the results of the authorities that came before them. Both of these men demanded a new standard of precision, since there were so many examples of sloppy reasoning and observation that littered the path of the science of the past. There was also a common commitment to doubt in general and a concern about the "deceptions of the senses" 3, p. In addition, they believed in the reduction of problems to their smallest constituent parts as a general principle. Descartes and Bacon each saw himself primarily in the role of an advocate for science and therefore they contributed very little to any particular field of empirical science 5. Finally, both of these men were uniquely gifted to promote the particular aspects of science that were eventually crucial to its advance. The most obvious difference in methodology between Descartes and Bacon was related to their procedures for reasoning. Descartes began with intuitively derived principles that were taken as the premises in the standard deductive method of reasoning, but Bacon began with empirical observations that were used to inductively educe higher axioms. A crucial difference in the background of the two men is seen in the mathematical mastery of Descartes as compared to the mathematical neglect of Bacon. Background may explain the similarities in the method of Descartes which parallels that of mathematical proofs. For Bacon the empirical observations he emphasized for science may parallel the kind of "eye witness" evidence he required when building a case in a court of law. In view of Descartes background it appears obvious that his exemplar would be found among the mathematicians who he said "alone have been able to find some demonstrations, some certain and evident reasons. Because of this observation he was greatly impressed with the discovery of printing, gunpowder, and the magnet. In his view "no empire, no sect, no star seems to have exerted greater power and influence in human affairs than these mechanical discoveries" 3, pp. It is important to note that as different as the methods of Descartes and Bacon were, when their exemplars are synthesized into one, we have an anticipation of the modern mathematical-experimentalist. We can now see that when taken together, Rene Descartes and Francis Bacon were germinal for the modern scientific method. Rene Descartes, Discourse on Method, Trans. Rene Decartes, Meditations, Trans. Modern Library, 4. Macmillan Publishing, 5. Descartes did, however, contribute greatly to mathematics which is the proper place of application for his deductive method.

Chapter 5 : The Scientific Methods of Rene Descartes and Francis Bacon

Renowned painter, scientist, educator and civil rights activist Dr. Art Bacon will discuss his new exhibit at Troy University's International Arts Center on Feb. Bacon's Gallery Talk takes place from a.m. until p.m. in the center, which will display his work through April

Reproduced by permission of Archive Photos, Inc. The medieval English philosopher Roger Bacon insisted on the importance of a so-called science of experience. In this respect he is often thought of as a forerunner of modern science. Childhood, education, and university life It appears that Bacon was born in Ilchester, Somerset, England. He was born into a noble family, although not a major one. In his youth he studied the works of the ancient Greeks as well as arithmetic, geometry, astronomy, and music. At thirteen years old he entered Oxford University, where he spent the next eight years. He eventually received an advanced arts degree. In the s, perhaps in the early years of the decade, Bacon lectured at the University of Paris, France, on the works of the ancient Greek philosopher Aristotle c. During this period he also wrote three works on logic, or the study of how to reason correctly. Francis of Assisi " A universal science Early on Bacon had the idea for a universal, or general, science that would promote the spread of Christianity, prolong life, aid health, and unite theology the study of God and His ways and the science of experience. He praised science as being "most beautiful and most useful. At the time there were many who believed that a struggle with the antichrist or great evildoer whose arrival on Earth was predicted in the Bible was near at hand. Bacon saw a science of experience as a Christian weapon for the fight. It is quite likely that Bacon became a Franciscan in Francis had posed problems for his followers. Franciscans were required to take a vow of poverty, but their work had grown to such size and importance that it was impossible to continue it unless the order owned property and other possessions. The owning of property by the Franciscan order, however, was seriously questioned by a group of Franciscans. Bacon joined this group. His works About Bacon was taken from England to France and, for unknown reasons, underwent some kind of confinement, perhaps even an imprisonment, in a French monastery. One theory is that people questioned him because of his scientific interests, but it is more likely that his views on Franciscan life proved unpopular with some Franciscans in England. During this period of confinement Bacon wrote his greatest works: Opus majus major work , Opus minus minor work , and Opus tertium third work. In Opus majus he made use of scientific materials already written, added new material, and included a section on moral theory. With respect to the sciences, the overall tone of Opus majus is a plea, attempting to persuade the pope the head of the Catholic Church about the importance of experimental knowledge. After the three works, Bacon wrote a great part of Communium naturalium general principles of natural philosophy , one of his finest works. In he published another book on the study of philosophy in which the old, angry, argumentative Bacon reemerges. In it he claimed to see the presence of the antichrist in the then-warring Christian groups, and he took in general the extreme view of Franciscan life. It is also possible that an imprisonment in the final years of his life stems from this book. His works mention flying machines, self-driven boats, and an "instrument small in size, which can raise and lower things of almost infinite weight. He seems to have studied the refraction bending of light under experimental conditions. However, in his so-called science of experience he did not make any known advances in what is today called physics, nor did he make any known practical inventions. There is no evidence that Bacon made any important contribution to science, but there is much evidence that he was instead a reader, writer, and champion of science. The Life and Work of Roger Bacon. Roger Bacon in Life and Legend. Folcroft Library Editions, Desirey Sep 5, 4: I would greatly appreciate this.

Chapter 6 : Francis Bacon and the scientific revolution (article) | Khan Academy

Francis Bacon, gesturing towards an array of scientific instruments, is identified as the 'Renewer of Arts'." (from the National Portrait Gallery, London) Once Bacon's philosophies regarding experimentation and observation came to be accepted, people began using them to harness nature for profit.

He was deeply interested in it. Early life Bacon was born into a wealthy family; he was well-versed in the classics and enjoyed the advantages of an early training in geometry, arithmetic, music, and astronomy. Inasmuch as he later lectured at Paris, it is probable that his master of arts degree was conferred there, presumably not before a date in keeping with his claim that he saw the Franciscan professor Alexander of Hales at the University and scientific career. In the earlier part of his career, Bacon lectured in the faculty of arts on Aristotelian and pseudo-Aristotelian treatises, displaying no indication of his later preoccupation with science. His Paris lectures, important in enabling scholars to form some idea of the work done by one who was a pioneer in introducing Aristotle into western Europe, reveal an Aristotelianism strongly marked by Neoplatonist elements stemming from many different sources. The influence of Avicenna on Bacon has, however, been exaggerated. The change was probably caused by his return to Oxford and the influence there of the great scholar Robert Grosseteste, a leader in introducing Greek learning to the West, and his student Adam de Marisco, as well as that of Thomas Wallensis, the bishop of St. Asaph. Bacon devoted himself wholeheartedly to the cultivation of those new branches of learning to which he was introduced at Oxford—languages, optics, and alchemy—and to further studies in astronomy and mathematics. It is true that Bacon was more skeptical of hearsay claims than were his contemporaries, that he was suspicious of rational deductions holding to the superior dependability of confirming experiences, and that he extolled experimentation so ardently that he has often been viewed as a harbinger of modern science more than years before it came to bloom. Yet research on Bacon suggests that his characterization as an experimenter may be overwrought. His originality lay not so much in any positive contribution to the sum of knowledge as in his insistence on fruitful lines of research and methods of experimental study. Bacon, to be sure, did have a sort of laboratory for alchemical experiments and carried out some systematic observations with lenses and mirrors. His studies on the nature of light and on the rainbow are especially noteworthy, and he seems to have planned and interpreted these experiments carefully. He seriously studied the problem of flying in a machine with flapping wings. He was the first person in the West to give exact directions for making gunpowder; and, though he knew that, if confined, it would have great power and might be useful in war, he failed to speculate further. Its use in guns arose early in the following century. Bacon described spectacles which also soon came into use; elucidated the principles of reflection, refraction, and spherical aberration; and proposed mechanically propelled ships and carriages. He used a camera obscura which projects an image through a pinhole to observe eclipses of the Sun. Because of ill health and his entry into the Order of Friars Minor, Bacon felt as he wrote forgotten by everyone and all but buried. His university and literary careers seemed finished. His feverish activity, his amazing credulity, his superstition, and his vocal contempt for those not sharing his interests displeased his superiors in the order and brought him under severe discipline. He decided to appeal to Pope Clement IV, whom he may have known when the latter was before his election to the papacy in the service of the Capetian kings of France. In a letter the pope referred to letters received from Bacon, who had come forward with certain proposals covering the natural world, mathematics, languages, perspective, and astrology. Bacon had argued that a more accurate experimental knowledge of nature would be of great value in confirming the Christian faith, and he felt that his proposals would be of great importance for the welfare of the church and of the universities. The pope desired to become more fully informed of these projects and commanded Bacon to send him the work. But Bacon had had in mind a vast encyclopaedia of all the known sciences, requiring many collaborators, the organization and administration of which would be coordinated by a papal institute. The work, then, was merely projected when the pope thought that it already existed. He had to do this secretly and notwithstanding any command of his superiors to the contrary; and even when the irregularity of his conduct attracted their attention and the terrible weapons of spiritual coercion

were brought to bear upon him, he was deterred from explaining his position by the papal command of secrecy. Under the circumstances, his achievement was truly astounding. Instead, he aspired to penetrate realms undreamed of in the schools at Paris and to lay bare the secrets of nature by positive study. The *Opus majus* was an effort to persuade the pope of the urgent necessity and manifold utility of the reforms that he proposed. Bacon, Roger English Franciscan philosopher and educational reformer Roger Bacon shown in his observatory at the Franciscan monastery, Oxford, England engraving c. The condemnation was probably issued because of his bitter attacks on the theologians and scholars of his day, his excessive credulity in alchemy and astrology, and his penchant for millenarianism under the influence of the prophecies of Abbot Joachim of Fiore , a mystical philosopher of history. How long he was imprisoned is unknown. His last work , incomplete as so many others, shows him as aggressive as ever.

bacon not preoccupied with science Among writers on education, the very magnitude of Bacon's position in the history of science has tended to overshadow his influence in other respects. Yet he urged the development of science because in his day it was relatively the most neglected and chaotic department of human endeavor, and not because he.

References and Further Reading 1. Albans, and Lord Chancellor of England was born in London in to a prominent and well-connected family. Lady Anne was a learned woman in her own right, having acquired Greek and Latin as well as Italian and French. Bacon was educated at home at the family estate at Gorhambury in Herfordshire. In , at the age of just twelve, he entered Trinity College, Cambridge, where the stodgy Scholastic curriculum triggered his lifelong opposition to Aristotelianism though not to the works of Aristotle himself. Yet only a year later he interrupted his studies in order to take a position in the diplomatic service in France as an assistant to the ambassador. In , while he was still in France, his father died, leaving him as the second son of a second marriage and the youngest of six heirs virtually without support. With no position, no land, no income, and no immediate prospects, he returned to England and resumed the study of law. In the meantime, he was elected to Parliament in as a member for Melcombe in Dorsetshire. He would remain in Parliament as a representative for various constituencies for the next 36 years. In his blunt criticism of a new tax levy resulted in an unfortunate setback to his career expectations, the Queen taking personal offense at his opposition. Any hopes he had of becoming Attorney General or Solicitor General during her reign were dashed, though Elizabeth eventually relented to the extent of appointing Bacon her Extraordinary Counsel in . It was around this time that Bacon entered the service of Robert Devereux, the Earl of Essex, a dashing courtier, soldier, plotter of intrigue, and sometime favorite of the Queen. No doubt Bacon viewed Essex as a rising star and a figure who could provide a much-needed boost to his own sagging career. After being knighted by the king, he swiftly ascended the ladder of state and from filled a succession of high-profile advisory positions: As Lord Chancellor, Bacon wielded a degree of power and influence that he could only have imagined as a young lawyer seeking preferment. Yet it was at this point, while he stood at the very pinnacle of success, that he suffered his great Fall. In he was arrested and charged with bribery. After pleading guilty, he was heavily fined and sentenced to a prison term in the Tower of London. Although the fine was later waived and Bacon spent only four days in the Tower, he was never allowed to sit in Parliament or hold political office again. The entire episode was a terrible disgrace for Bacon personally and a stigma that would cling to and injure his reputation for years to come. Yet the damage was done, and Bacon to his credit accepted the judgment against him without excuse. According to his own *Essays, or Counsels*, he should have known and done better. In this respect it is worth noting that during his forced retirement, Bacon revised and republished the *Essays*, injecting an even greater degree of shrewdness into a collection already notable for its worldliness and keen political sense. Yet whatever his flaws, even his enemies conceded that during his trial he accepted his punishment nobly, and moved on. Bacon spent his remaining years working with renewed determination on his lifelong project: The final edition of his *Essays, or Counsels*. The remarkable *Sylva Sylvarum*, or *A Natural History in Ten Centuries* a curious hodge-podge of scientific experiments, personal observations, speculations, ancient teachings, and analytical discussions on topics ranging from the causes of hiccups to explanations for the shortage of rain in Egypt. His utopian science-fiction novel *The New Atlantis*, which was published in unfinished form a year after his death. **Literary Works** Despite the fanatical claims and very un-Baconian credulity of a few admirers, it is a virtual certainty that Bacon did not write the works traditionally attributed to William Shakespeare. Indeed even if Bacon had produced nothing else but his masterful *Essays* first published in and then revised and expanded in and , he would still rate among the top echelon of 17th-century English authors. And so when we take into account his other writings, e. In fact it is actually a fairly complex affair that achieves its air of ease and clarity more through its balanced cadences, natural metaphors, and carefully arranged symmetries than through the use of plain words, commonplace ideas, and straightforward syntax. In this connection it is noteworthy that in the revised versions of the essays Bacon seems to have deliberately disrupted many of his earlier balanced effects to produce a style that is

actually more jagged and, in effect, more challenging to the casual reader. The work thus stands in the great tradition of the utopian-philosophical novel that stretches from Plato and More to Huxley and Skinner. In terms of its sci-fi adventure elements, the *New Atlantis* is about as exciting as a government or university re-organization plan. But in terms of its historical impact, the novel has proven to be nothing less than revolutionary, having served not only as an effective inspiration and model for the British Royal Society, but also as an early blueprint and prophecy of the modern research center and international scientific community.

Scientific and Philosophical Works It is never easy to summarize the thought of a prolific and wide-ranging philosopher. Yet Bacon somewhat simplifies the task by his own helpful habits of systematic classification and catchy mnemonic labeling. In effect, he dedicated himself to a long-term project of intellectual reform, and the balance of his career can be viewed as a continuing effort to make good on that pledge. In 1620, while he was still at the peak of his political success, he published the preliminary description and plan for an enormous work that would fully answer to his earlier declared ambitions. Of the intended six parts, only the first two were completed, while the other portions were only partly finished or barely begun. Consequently, the work as we have it is less like the vast but well-sculpted monument that Bacon envisioned than a kind of philosophical miscellany or grab-bag. It is basically an enlarged version of the earlier *Proficience and Advancement of Learning*, which Bacon had presented to James in 1612. It first appeared in 1620 as *The Advancement of Learning*.

Relatively early in his career Bacon judged that, owing mainly to an undue reverence for the past as well as to an excessive absorption in cultural vanities and frivolities, the intellectual life of Europe had reached a kind of impasse or standstill. Yet he believed there was a way beyond this stagnation if persons of learning, armed with new methods and insights, would simply open their eyes and minds to the world around them. This at any rate was the basic argument of his seminal treatise *The Proficience and Advancement of Learning*, arguably the first important philosophical work to be published in English. It is in this work that Bacon sketched out the main themes and ideas that he continued to refine and develop throughout his career, beginning with the notion that there are clear obstacles to or diseases of learning that must be avoided or purged before further progress is possible. But the phrase applies to any intellectual endeavor in which the principal aim is not new knowledge or deeper understanding but endless debate cherished for its own sake. Prodigal ingenuity is sterile results. What is needed is a program to re-channel that same creative energy into socially useful new discoveries. In many respects this idea was his single greatest invention, and it is all the more remarkable for its having been conceived and promoted at a time when most English and European intellectuals were either reverencing the literary and philosophical achievements of the past or deploring the numerous signs of modern degradation and decline. Indeed, while Bacon was preaching progress and declaring a brave new dawn of scientific advance, many of his colleagues were persuaded that the world was at best creaking along towards a state of senile immobility and eventual darkness. That history might in fact be progressive, in the *Advancement*, the idea is offered tentatively, as a kind of hopeful hypothesis. But in later works such as the *New Organon*, it becomes almost a promised destiny: Enlightenment and a better world, Bacon insists, lie within our power; they require only the cooperation of learned citizens and the active development of the arts and sciences.

The Reclassification of Knowledge In Book II of *De Dignitate* his expanded version of the *Advancement* Bacon outlines his scheme for a new division of human knowledge into three primary categories: Although the exact motive behind this reclassification remains unclear, one of its main consequences seems unmistakable: Meanwhile, poetry the domain of everything that is imaginable or conceivable is set off to the side as a mere illustrative vehicle. This notion of surpassing ancient authority is aptly illustrated on the frontispiece of the volume containing the *New Organon* by a ship boldly sailing beyond the mythical pillars of Hercules, which supposedly marked the end of the known world. The *New Organon* is presented not in the form of a treatise or methodical demonstration but as a series of aphorisms, a technique that Bacon came to favor as less legislative and dogmatic and more in the true spirit of scientific experiment and critical inquiry. Bacon points out that recognizing and counteracting the idols is as important to the study of nature as the recognition and refutation of bad arguments is to logic. Thus a Baconian idol is a potential deception or source of misunderstanding, especially one that clouds or confuses our knowledge of external reality. Bacon identifies four different classes

of idol. Each arises from a different source, and each presents its own special hazards and difficulties. The Idols of the Tribe. These are the natural weaknesses and tendencies common to human nature. Because they are innate, they cannot be completely eliminated, but only recognized and compensated for. Our senses "which are inherently dull and easily deceivable. Which is why Bacon prescribes instruments and strict investigative methods to correct them. Our tendency to discern or even impose more order in phenomena than is actually there. As Bacon points out, we are apt to find similitude where there is actually singularity, regularity where there is actually randomness, etc. Our tendency to rush to conclusions and make premature judgments instead of gradually and painstakingly accumulating evidence. The Idols of the Cave. Unlike the idols of the tribe, which are common to all human beings, those of the cave vary from individual to individual. They arise, that is to say, not from nature but from culture and thus reflect the peculiar distortions, prejudices, and beliefs that we are all subject to owing to our different family backgrounds, childhood experiences, education, training, gender, religion, social class, etc. Special allegiance to a particular discipline or theory. High esteem for a few select authorities. The Idols of the Market Place. The Idols of the Theatre. Like the idols of the cave, those of the theatre are culturally acquired rather than innate. And although the metaphor of a theatre suggests an artificial imitation of truth, as in drama or fiction, Bacon makes it clear that these idols derive mainly from grand schemes or systems of philosophy "and especially from three particular types of philosophy: Sophistical Philosophy "that is, philosophical systems based only on a few casually observed instances or on no experimental evidence at all and thus constructed mainly out of abstract argument and speculation. Bacon cites Scholasticism as a conspicuous example. Empirical Philosophy "that is, a philosophical system ultimately based on a single key insight or on a very narrow base of research, which is then erected into a model or paradigm to explain phenomena of all kinds. Bacon cites the example of William Gilbert, whose experiments with the lodestone persuaded him that magnetism operated as the hidden force behind virtually all earthly phenomena. He cites Pythagoras and Plato as guilty of this practice, but also points his finger at pious contemporary efforts, similar to those of Creationists today, to found systems of natural philosophy on Genesis or the book of Job. According to Bacon, his system differs not only from the deductive logic and mania for syllogisms of the Schoolmen, but also from the classic induction of Aristotle and other logicians. As Bacon rightly points out, one problem with this procedure is that if the general axioms prove false, all the intermediate axioms may be false as well. In effect, each confirmed axiom becomes a foothold to a higher truth, with the most general axioms representing the last stage of the process. Thus, in the example described, the Baconian investigator would be obliged to examine a full inventory of new Chevrolets, Lexuses, Jeeps, etc. And while Bacon admits that such a method can be laborious, he argues that it eventually produces a stable edifice of knowledge instead of a rickety structure that collapses with the appearance of a single disconfirming instance. Indeed, according to Bacon, when one follows his inductive procedure, a negative instance actually becomes something to be welcomed rather than feared. For instead of threatening an entire assembly, the discovery of a false generalization actually saves the investigator the trouble of having to proceed further in a particular direction or line of inquiry. Meanwhile the structure of truth that he has already built remains intact. Although he himself firmly believed in the utility and overall superiority of his method, many of his commentators and critics have had doubts.

Chapter 8 : Francis Bacon Biography - Francis Bacon Childhood, Life & Timeline

Order Quality Bacon Here! Bacon is one of the ultimately-loved Paleo foods. It is generally prepared from the fatback, the sides, or the belly of the pig. These cuts are then cured using salt, either in a brine (with water) or via dry packing.

Sophistical Syllogisms, Defective in Form 3. Accent, Figure of a Word. Accident, Consequent, Secundum quid et simpliciter, Ignoratio elenchi, Petitio principii, Non causa pro causa, Plurium interrogationum. He taught Aristotelian physics and metaphysics as a Master of Arts at the University of Paris before His lectures are the earliest known surviving Western lectures on these subjects Rufus flourished between and , teaching philosophy and theology at Oxford and Paris in this crucial period. One thing is clear: Whether the work was written by Richard Rufus is another matter. The issue of ascription, however, does not lessen the importance of this text for understanding English natural philosophy in the 13th century. Bacon holds that scientific knowledge is twofold: This implicit knowledge is innate. Second, there is explicit rational knowledge. One part of this has to do with the knowledge of the principles of science; the other is the knowledge of conclusions. This latter is complete knowledge though it is not exhaustive. Bacon distinguishes experientia from experimentum. Experience experientia is the distinct knowledge of singular things, and all animals have this distinct knowledge of singulars. But not all animals have experimentum, that is, a science of principles based on experience. Many animals have an image imaginatio of singular things and live by innate art and industry, naturally knowing how to adapt to changing weather conditions. Human art, however, is acquired and is a science of principles based on experience experimentum principium. Scientific knowledge, once established, proceeds by demonstration. Experientia designates the simple perception of singulars. Only in a very loose sense can it be used of scientific knowledge. Sometimes, however, these two terms about experience are used interchangeably. In this account, Bacon has not yet come to his later notion of a scientia experimentalis, and the experimental verification certificatio of the conclusions of demonstrative knowledge ca. He is dealing only with experience as the source of the principles of our knowledge of art and science. It is the principle of action and of knowledge. In general, for Bacon, matter is not a mere potency. It is an incomplete something substance and so for him matter and form are two incomplete substances that integrate to make one individual substance. In this one notices a notion of matter as in some sense a positive thing. It is not a nullity. In both early and later works, Bacon objects to the idea that matter is one in number in all things. The background to this issue arises from Franciscan discussions at Paris on the nature of the unity of matter. Bacon holds that matter "is not numerically one, but in itself and from itself it is numerically distinct in numerically different beings. For example, matter as potentiality is the original source of the being of contingent things. This is the non-being of the creature in contrast with the being of the Creator. Thus, Bacon will speak of the matter of both corporeal and spiritual beings, and hence of "spiritual matter," a concept that Aquinas found to be contradictory. The very strong influence of the Fons Vitae of Ibn Gabirol on Roger Bacon, John Pecham, and other Franciscan authors forms the background for their treatment of hylomorphism Hackett, forthcoming. The importance of this hylomorphism in the Franciscan school at Paris has been examined by Anna Rodolfi In his later works, and specifically in his works on natural philosophy, Bacon presents nature as an active agent. The form or the species is the first effect of any natural agent. The power of the species educes the emergence of the thing from the potency of matter. Matter has an active potency, and this is actualized due to the action of the natural external agent. In the works from the s, Bacon distinguishes the real universal from the mental universal. Hence, the universal as the ultimate basis of predication is not the species as mental intention. Universals in the primary sense as the basis of scientific objectivity are extra-mental. Certainly, he is not a complete Platonist in regard to universals. To the objection that since form is individuated through its matter and whatever exists in things must exist in matter as individuated, but the universal is not such a thing, he replies that a universal is either in the mind or in things; if it is not in the former, it has to be in the latter. A universal arises from common matter and common form and so has no need of being immediately individuated: Hence, one cannot split apart the common matter from the particular matter or the common form from the particular form of a particular individual. In one question, Bacon rejects

the view that universals are constituted only by the mind. He holds that the universal in and of itself is prior to the knowledge process: This sounds Platonic, but in fact for Bacon there are no Platonic universals in a separate world; rather, real universals do exist, but they are found only in and with individual things. There is a mutual interpenetration of common form and matter and proper form and matter such that there is just one individual, and so the common nature is realized in this or that individual. Only three kinds of being are imaginable: And thus, without them [the particulars] there can be no universals⁴. Bacon treats the problem of individuation both in the early Parisian lectures and the later *Communia naturalium*. It is addressed in the next section. Here, I will briefly review his account of individuation in the Parisian lectures. Some hold that accidents are the cause of individuation. The examples are taken from Boethius and from Al-Ghazali. Bacon raises objections and states that matter and form constitute the thing and are the causes of individuation. For Bacon, an individual is both a substance and an individual. As a substance, accident could not be the cause of individuation. First, from the formal cause, accident could be the cause of individuation, but from the efficient cause the principles of substance matter and form are the efficient causes of the one substance. He devotes much space to whether matter alone or form alone or both are causes of individuation. He outlines the reasons why matter alone can be taken as the cause of individuation. He holds that matter is a cause of individuation and that form is a co-cause of individuation. The latter, however, is not the principal cause; it is an instrumental or formal cause. On the Way to Late Medieval Nominalism? In the light of the foregoing, a key issue arises in his early works: This realism is continued in the *Communia naturalium* [OHI, 2⁴] but with certain important qualifications. This polemical account of the discussion of Aristotle in the *Metaphysics* is understood by Bacon as an aid for the study of theology. And now, it is clear that for Bacon, in the intention and execution of nature, the individual has definite ontological priority over genera and species. His account becomes an attack on contemporary positions influenced by Albertus Magnus that would subordinate the individual to the universal. Species and genera are there for the sake of the production of the individual. He states, "In no other field are the authorities in such disagreement. Bacon finds a correct answer in the *Metaphysics* of Avicenna: There are two kinds of nature, universal and particular, Avicenna teaches in the sixth book of [his] *Metaphysics*. This universal nature is the corporeal nature that is designated in the second genus, which is [that of] body, and this nature excludes all incompatible things which are abhorrent to the whole universe, such as a vacuum. The "particular nature" is the directing power of the species with its individuals, and is divisible into the directive power of the species and of the individual. The example he gives is from embryology: And there is the directing power of the individual, which aims at the determinate individual human as such and mankind in general. He then states the ontological priority of the individual over universals as follows: But if we would speak about the universal nature that is the directing power of the universe, [we should say that] it intends and brings about an individual first and principally, about which there is mention in the *Book of the Six Principles*. Nature operates in a hidden manner in things: And the cause of this is that one individual excels all universals in the world, for a universal is nothing but the agreement of many individuals. One can notice that Bacon is now writing as a person with a theological interest: Bacon knows that he is defending a position in rank opposition to the common view: This account has given rise to opposing interpretations. Theodore Crowley saw in these passages the beginnings of late medieval nominalism that would find its expression in William of Ockham. Maloney challenged this reading and argued that the later Roger Bacon, like the earlier Bacon, was not a nominalist but a moderate realist. Perhaps we should hold that there are elements of proto-nominalism in this account in the *Communia naturalium*. In his important essay on individuation in the fourteenth century, Jorge J. Gracia argues for seeing this text and others as the beginning of the strict tradition of late medieval nominalism. Early Works Bacon understands the soul to be a spiritual substance in union with the Body. At this early stage, he does not hold the Avicennian notion of a separate agent intellect. In union with the body, the soul has two intellects, potential and agent. The former is directly connected with the sensitive powers and the object of this intellect is the singular material thing. The agent intellect is directed upward and knows spiritual beings in its own essence.

Chapter 9 : Sir Francis Bacon > By Individual Philosopher > Philosophy

Francis Bacon was a legendary English philosopher, scientist, lawyer, author, statesman, jurist and father of the scientific methods. He was one of the most influential personalities in natural philosophy and was also a key thinker to develop new scientific methodologies.

London, England, 22 January ; d. London, 9 April philosophy of science. In he married Alice Barnham. He was knighted on the accession of James I In , became lord chancellor in , and was made viscount St. Bacon was dismissed from the chancellorship in after being convicted of bribery, a strain under which his health broke down. He then lived in retirement near St. Albans, devoting his remaining years to natural philosophy. During and immediately following his lifetime his principal publications in these areas were *The Advancement of Learning* , expanded and latinized as *De augmentis scientiarum* ; *De sapientia veterum* ; *Novum organum* ; and *Sylva Sylvarum* and *New Atlantis* . Many of his shorter works, some of them fragmentary and published posthumously, are of equal scientific and philosophical interest. Although Bacon was a contemporary of William Gilbert , Galileo, Johannes Kepler , and William Harvey , he was curiously isolated from the scientific developments with which they were associated. Mathematics was, he thought, to be used as a tool in natural philosophy, not as an end, and he had no pretensions to mathematical learning. Even in his earlier works, Bacon posed the fundamental dilemma of atomism: On the other hand, empirical phenomena of cohesion and continuity are impossible to understand in terms of inert atoms alone; and the existence of spirituous substances, even in space void of air, seems to cast doubt upon the existence of the absolute void demanded by atomism. That virtues seem thus to emanate from bodies through space is an argument for suspecting that there may be incorporeal substances: It would be a mistake, however, to suppose that Bacon necessarily thought of his view on spirits as opposed to a mechanical theory of nature. It can be argued, however, that, unlike Descartes, Bacon was not attempting to reach theoretical conclusions but, rather, to lay the necessary foundations for his inductive method. To that method we now turn. *De augmentis scientiarum* and *Novum organum* are the first and second parts of his projected Great Instauration, and the applications of the method that were to have constituted four further parts reached only a fragmentary stage in the *Histories*, most of which were published posthumously. In *De augmentis scientiarum*, which is concerned primarily with the classification of philosophy and the sciences, Bacon develops his influential view of the relation between science and theology. He distinguishes in traditional fashion between knowledge by divine revelation and knowledge by the senses, and divides the latter into natural theology, natural philosophy, and the sciences of man. Such a view was hardly influential until the Enlightenment, whereas seventeenth-century natural philosophers generally followed Bacon in claiming a religious function for their investigations; this was undoubtedly one important factor in the public success of the scientific movement. Having placed his project within the complete framework of knowledge in true Aristotelian fashion, Bacon proceeds to demolish all previous pretensions to natural philosophy. Such an impression is easily dispelled, however, by a closer reading of the text of *Novum organum*. We shall follow his account of the method in that work. The consequences of the Fall for the intellect will then be erased, and man will be able to return to his God-given state of dominion over creation. In order to discover what primary qualities are relevant to the form, Bacon prescribes his Tables of Presence, Absence, and Comparison: To ensure that as many irrelevant natures as possible are eliminated at this stage, these instances should be as unlike each other as possible except in the nature of heat. Second, a Table of Absence should be drawn up, in which as far as possible each instance in the Table of Presence should be matched by an instance similar to it in all respects except heat, such as rays of the moon and stars, phosphorescence, and cool liquids. This is the method of exclusion by negative instances, which will at once test a putative form drawn from the Table of Presence; if it is not the true form, it will not be absent in otherwise similar instances when heat is absent. Construction of the tables demands not a passive observation of nature, but an active search for appropriate instances; and it therefore encourages artificial experiment. The conception seems to be something like an Aristotelian classification into genus, species, and differentia, in which every nature has its place. It also has some affinity with the later conception of a

theoretical structure that yields observation statements by successive deductions from theoretical premises. The axioms are emphatically not the result of a leap to postulated premises from which observations may be deduced, for this is not an infallible method and gives no guarantee that the axioms arrived at are unique, let alone true. Bacon is not unaware that the infallibility of his method depends crucially on there being only a finite number of simple natures and on our ability to enumerate all those present in any given instance. His faith that nature is indeed finite in the required respects seems to rest upon his natural philosophy. Although he rejected atomism, he retained the belief that the primary qualities are few in number and regarded the inductive method as the means to discover which qualities they are. I hope I should bring in industrious observations, grounded conclusions, and profitable inventions and discoveries. In it was advertised in *The Advancement of Learning*—the only work Bacon ever published in English. His unfinished account of the ideal scientific society was published posthumously in *New Atlantis*, which ranks among the best-known and most delightful Utopian writings in the world and has been perhaps the most influential. Now that the true method had been described, he thought all that was required was the purgation of the intellect to make a fit instrument for the method, and the human and financial resources to carry it out. His successors in this area should be sought among the inductive logicians, beginning with Hume and Mill, and not among the scientists. Probably written before , published *Novum organum*, in Works I, ; IV, *De sapientia veterum*, in Works, VI, , *Novum organum*, 1, ; IV, *Historia vitae et mortis* , in Works, II, ; V, *Sylva sylvarum*, in Works, II, ff. *De augmentis scientiarum*, in Works, I, ; IV, Also *Novum organum*, I, ; IV, *Novum organum*, I, ; IV, 58 ff. *Abecedarium naturae*, in Works, II, 85; V, *Novum organum*, I, ; IV, *Letters and Life*, I, London, , which contains valuable prefaces and notes. The philosophical and scientific works are in Vols. All page references in the Notes are to these editions. I have modified some of the translations. For further original works and secondary literature, see R. A useful edition of an individual work with notes, introduction, and bibliography is *Novum organum*, Thomas Fowler, ed. There are many biographies, and their quality varies greatly. The most valuable recent examples are F. Crowther, *Francis Bacon* London, ; and B. The recent books and articles listed give references to further material whose absence from this list does not imply any value judgment: Levi, *Il pensiero di F. Rossi, Francesco Bacone, dalla magia alla scienza* Bari, ; English trans. Recent general works with extensive references to Bacon are R. Madden, *Theories of Scientific Method: Kargon, Atomism in England From Hariot to Newton* Oxford, , which contains a good bibliography of recent scholarly articles on Bacon, pp. *Concept and Creation* Cambridge, Mass. Mary Hesse Pick a style below, and copy the text for your bibliography.