

# The Bookman

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## FRANCIS BACON AND HIS MEDICAL UTOPIA

Some readers will wonder why I have chosen to devote this article to Francis Bacon, a man who lived more than three and a half centuries ago, and had only an indirect involvement with medicine. It is true that Bacon was not a practicing scientist, and as an English aristocrat he spent most of his life in court circles.<sup>1</sup> Yet, he became preoccupied with the development of science and its implications for bettering the human lot. He saw medicine as the most important of all the scientific disciplines, and drew up a program for its advancement. He assessed the state of medicine as practiced by his contemporaries, and pointed out areas of research that would contribute significantly to medical progress. In his New Atlantis, a utopian work which is still very readable today, Bacon demonstrated how his visionary ideas on science could be utilized to create an ideal society.

Most of us remember Bacon as one of the founders of modern science, and perhaps associate his name with the empirical method. Disillusioned with the principles of Aristotelian natural philosophy, which he felt provided no useful knowledge, Bacon set out to establish science on a new foundation. His famous method entailed making observations, performing experiments, and drawing inductive inferences from them. The conclusions thus obtained would be infallible, if the procedure was followed carefully and thoroughly. We now know that the Baconian method was not incorrect but was incomplete. The development of science has

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<sup>1</sup> Francis Bacon was born in London in 1561 to an aristocratic family. He served in various official capacities in the courts of Elizabeth I and James I, becoming lord chancellor in 1618. After his dismissal from this post in 1621, he lived in retirement, and devoted his last years to science and philosophy, topics which had been of extreme interest to him since the early 1590's. He died alone in April 1626, probably from pneumonia, in a cold and empty house that belonged to a nobleman, where he had taken shelter. "I leave my name," he wrote, "in books exempted from the wrongs of time and capable of perpetual renovation."

depended on far more complex circumstances than envisioned by Bacon, and has been more in a "leaps and bounds" fashion than in the linear progression that he imagined.

Bacon still continues to command our attention because he was the first to define clearly the goals of scientific development and to envision an ideal society governed by a group of technocrats. He advocated the utilization of science for the benefit of mankind, while warning against the evils of its misuse. As a Christian, he upheld the Biblical account of the fall of man as the cause of man's troubles on earth. The use of scientific knowledge constituted the only means of improving the human condition and raising man's dignity and greatness to its original level. "Wherefore there is no hope of greater advancement and progress," Bacon declared, "but in the Restauration of Sciences."<sup>2</sup>

Yet, Bacon was keenly aware of the dangers which might arise from the misuse of knowledge. After all, "the desire of Knowledge" was the direct cause of the fall of man, and knowledge, if not directed properly, could become easily a hazardous commodity.

In summ, I would advise all in general, that they would take into serious consideration the true and Genuine ends of knowledge; that they seek it not either for pleasure, or Contention, or Contempt of others, or for Profit, or Fame, or for Honour and Promotion; or such like adulterate or inferior ends: but for the merit and emolument of Life,....<sup>3</sup>

Bacon disapproved the pursuit of science for personal ends. Scientific knowledge was not to be used simply to derive personal pleasure and to obtain promotions and financial benefits. Rather, the application of scientific knowledge was restricted to areas which had direct bearing on the condition of mankind as a whole.

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<sup>2</sup>Francis Bacon, Of the Advancement and Proficiencie of Learning: or the Partitions of Sciences (London: Printed for Thomas Williams, 1674), Preface, p.22.

<sup>3</sup>Ibid., pp. 12-13.

Undoubtedly, Bacon would have condemned some of the uses to which scientific knowledge has been put in contemporary society. Science has become a tool for political powers who willingly allocate significant portions of society's resources to the development of war machines. To the capitalist mind, science has offered the possibility of manufacturing a wide range of commodities and developing the need for them. Further, science has helped a certain group of people to rise to power, technocrats capable of manipulating the body of knowledge to solve a variety of problems. There are many uses of science, however, which fall within the scope envisioned by Bacon. Most of the research and development in the biomedical sciences are in this category.

Bacon expounded his ideas on medicine in the fourth book of The Advancement of Learning (1605). Finding the medicine of his day burdened with worthless speculations, he pointed out areas which needed cultivation. First of all, medicine was a natural science with a threefold task: "The first is Conservation of Health, second the Cure of Diseases; the third Prolongation of Life." In this regard, the physician assumed a great responsibility for man's well being on this earth. He needed to have detailed knowledge of how man's body functioned so that he would "know how to tune, and finger this Lyre of man's body; that the Harmony may not become discordant and harsh."<sup>4</sup> The knowledge of diseases, their causes and symptoms, and of various drugs was indeed essential for a practicing physician. But such knowledge alone did not suffice:

So, in Disquisitions Anatomical, the manner is, that those parts which pertain in general to Man's body, are most diligently enquired and observed even to a curiosity, and that in every least file: but as touching the variety which is found in divers bodies, there the diligence of Physicians fails. And therefore I grant that simple

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<sup>4</sup>Ibid., p. 120.

Anatomy has been most clearly handled; Comparative Anatomy, I define to be deficient.<sup>5</sup>

By comparative anatomy, Bacon did not mean knowledge of the anatomical structure of various species, "but the divers figure, condition, and posture of those parts in diverse men." He insisted that knowledge gained by dissecting one or two bodies, as was the case with teaching medicine then, proved insufficient. Rather, man's knowledge of his own body "must arise from the attentive and exact observation of many Dissections:...."

Equally, Bacon placed importance on the study of pathological anatomy and its role in understanding diseases.

And in these differences of inward parts, there are often found the Causes continent of many Diseases;....In like manner the Footsteps and Impressions of Diseases, and the lesions and devastations of the inward parts by them, are to be observed with diligence in divers Anatomies;.... I say all these and such other, should be with great diligence inquired,...and the experiments of many Physicians collected and collated together.<sup>6</sup>

The significance of the research program which Bacon outlined in the above passage would not be appreciated for another two hundred years. The application of pathological anatomy to the diagnosis of diseases became standard practice in the nineteenth century. Only then, physicians were able to correlate successfully lesions found at autopsy with symptoms observed during the course of disease.

Another area in medical research involved experimentation with animals. Especially, performing experiments on the living body would provide one with information otherwise not obtained by studying the non-living. "That many Pores, Passages and Pertusions, which are more subtile than the rest, appear not in Anatomical dissections, because they are shut and latent in Dead Bodies; whereas

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<sup>5</sup>Ibid., p. 123.

<sup>6</sup>Ibid., p. 124.

they are open and manifest in Live."<sup>7</sup> Since vivisection on humans could not be carried out for practical and humanitarian reasons, Bacon advocated the use of animals instead. However cruel the practice seemed to many people, it had to be undertaken for no other reason than the usefulness of this knowledge in medical applications.

While maintaining health and curing diseases comprised the traditional duties of physicians, the prolongation of life, Bacon believed, had received minimal attention. Efforts to prolong human life, which implied not only living longer but also living in a healthier state, would be held in high esteem and be "the most noble of all." He urged that physicians undertake research into the problem of prolonging human life by means of special diets and exercise, and by creating environments conducive to better health. Bacon further noted, quite perceptively, that improved longevity would give the medical profession unmatched powers over human life: "nor shall Physicians be honour'd only for Necessity, but for a gift, the greatest of earthly Donations that could be confer'd on mortality, whereof men, next under God, may be the Dispensers and Administrators."<sup>8</sup>

Let us now turn to New Atlantis, a work that Bacon wrote during his declining years and was left unfinished. It involves the story of a group of voyagers who sail from Peru towards the Far East but get lost in the Pacific during a severe storm. When the bad weather subsides, they find themselves off the coast of an island inhabited by people of European origin. After negotiations conducted in Spanish (the residents of the island can also communicate in Latin, Greek, and Hebrew), the crew of the ship are permitted to land on the island of

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<sup>7</sup>Ibid.

<sup>8</sup>Ibid., p. 127.

Bensalem. New Atlantis is an account of a Christian society ruled by a group of scientists who make it possible for its residents to lead peaceful lives, relatively free of disease and other calamities.

The highest governing body in this utopian land consists of the fellows of Salomon's House. The fellows work in a team, and each one is assigned specific duties such as designing and conducting experiments, evaluating data, formulating axioms and laws, determining the usefulness of such knowledge, and deciding what should be published. There is a considerable degree of clandestineness about their activities; the fellows are not easily accessible to residents, and take "an oath of secrecy for concealing of those which we think fit to keep secret." Nevertheless, they all work toward one common goal--to understand the laws of Nature and to use this knowledge for the betterment of mankind. "The End of our Foundation," asserts one of the revered fellows of Salomon's House, "is the Knowledge of Causes, and Secret Motions of things, and the enlarging of the Bounds of Human Empire, to the effecting of all things possible."<sup>9</sup>

The people of Bensalem have built towers to monitor climatic conditions and to make astronomical observations. They have dug tunnels, wells and underground caves to utilize the mineral resources and the extraordinarily healthful water and air found there. Some of these wells provide a special liquid called "Water of Paradise, being...sovereign for health and prolongation of life." The air in many of the caves is conducive to good health, and some hermits choose to live there for extended periods. By making observations on their health and behavior, the fellows learn a great deal about longevity. Air with modified

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<sup>9</sup>Francis Bacon, New Atlantis in Sylva Sylvarum (London: Printed for W. Lee, 1669), p.23.

New Atlantis has been reprinted in Great Books of the Western World, vol. 30 (Chicago: Encyclopaedia Britannica, Inc., 1952), pp.197-214.

properties is also employed in medical applications. "We have also certain Chambers, which we call Chambers of Health, where we qualifie the Air, as we think good and proper for the cure of divers Diseases, and preservation of Health."<sup>10</sup>

The island is also equipped with various laboratories for conducting experiments with plants and animals. We learn that scientists of this utopian land are already involved in genetic manipulation and can "make one tree or plant turn into another." They also have parks and zoos, where they keep a large variety of animals. These animals are employed in anatomical dissections, physiological and surgical experiments, and in testing drugs and poisons. Both plants and animals are also used in the manufacture of medicines and dietetic substances, especially prepared for preserving health.

Information gathered through different research projects is used to predict epidemics and other natural disasters, and to protect the people of Bensalem against them. Presumably, physicians of this utopian island already know a great deal about prevention and treatment of diseases, although the author of New Atlantis does not disclose any details. It is clear, however, that the ultimate purpose of scientific endeavor is to control and to mitigate the effects of devastating factors in human life. "And we do also declare Natural Divinations of Diseases, Plagues, Swarms of hurtful Creatures, Scarcity, Tempests, Earth-quakes, great Inundations, Comets, Temperature of the Year, and divers other things; and we give counsel thereupon, what the People shall do for the prevention and remedy of them."<sup>11</sup>

New Atlantis offered the first description of a scientific institution

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<sup>10</sup>Ibid., p. 24.

<sup>11</sup>Ibid., p. 28.

dedicated to solving the problems of the human race. It served as a model for other utopian writings with scientific themes, and strongly inspired the group of scientists who were instrumental in establishing the Royal Society of London in 1660. Thus, New Atlantis has been perhaps the most influential of Bacon's works. It still ranks among the best-known utopian writings.

Despite Bacon's awareness of the possible misuses of science, New Atlantis does not give any indication of ethical problems in the society of Bensalem. Undoubtedly, Bacon felt that if man's actions were undertaken with true Christian intentions, there would be no occasion for abuses of scientific knowledge. As one high official of Bensalem notes, "We have certain Hymns and Services, which we say daily, of Laud and Thanks to God for his marvellous Works; and Forms of Prayers, imploring his aid and blessing for the Illumination of our Labours, and the turning of them into good and holy uses."<sup>12</sup> This was the spirit in which Francis Bacon envisioned his ideal society governed by scientific principles.

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<sup>12</sup>Ibid. [my emphasis]