
Science and Society in the New Atlantis and Other Renaissance Utopias

Author(s): Judah Bierman

Source: *PMLA*, Vol. 78, No. 5 (Dec., 1963), pp. 492-500

Published by: [Modern Language Association](#)

Stable URL: <http://www.jstor.org/stable/460726>

Accessed: 13/05/2013 12:57

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at
<http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



Modern Language Association is collaborating with JSTOR to digitize, preserve and extend access to *PMLA*.

<http://www.jstor.org>

SCIENCE AND SOCIETY IN THE *NEW ATLANTIS* AND OTHER RENAISSANCE UTOPIAS

BY JUDAH BIERMAN

I

THOUGH apparently only a fragment, the posthumously published *New Atlantis* provides insights into Bacon's idea of science not discoverable in his other works.¹ In Salomon's House, the poet of science gave a local habitation and a name to the process and product of science, creating a concrete image of the "learning" for which he had sued so eloquently and so fruitlessly twenty years earlier before the new monarch, the learned James. Clearly an integral part of Bacon's program, in many places the *New Atlantis* is no less than a fictionalized paradigm of *The First Book of the Advancement of Learning*.² For example, as a correlative to the arguments by which he defended learning from the ignorant zeal of religious, political, and social fanatics, Bacon created in the *New Atlantis* a little world sanctified to God, politically stable, socially conservative, and morally pure and dedicated to the pursuit of science. Further, in its leading institution, the College of the Six Days Works, we find also a correlative to the criticisms of contemporary scientific practice that Bacon had offered earlier in *The Advancement* in his analysis of "the errors and vanities which have intervened amongst the studies themselves of the learned" and in the "peccant humours" which weaken and corrupt learning. But the *New Atlantis* is more than a mere paradigm: it projects an image of science in operation and of the relation of scientists to society not to be found in Bacon's earlier works. My purpose here is to explore the structure of that image, emphasizing in particular the contrast between it and the image of science projected by other Renaissance utopias.

In attempting to explicate Bacon's idea of science, I wish to avoid at this time the question of Bacon's responsibility for man's current dilemma.³ In this essay, utopias are considered primarily as narrative fictions rather than as social blueprints or reform programs.⁴ While it is true that in utopias, as in other fictions, the persons, places, and things which appear are drawn from the ken and milieu of the author, in this analysis the institutions of the utopist's created society are considered as characters in his fictional world. The order of their coming and their going and of their being is a ceremony of meaning that speaks more effectively than the stilted di-

ologue of the visitor and his guide. Thus, we shall look for the idea of science in the relative size and place of the buildings which house it as well as in the modes of its opera-

¹ Assessments of Bacon's role in the rise of the idea of science are standard enough not to require broad documentation. The most frequently quoted judgments come from Basil Willey's chapter, "Bacon and the Rehabilitation of Nature," in *Seventeenth Century Background* (London, 1934), and Douglas Bush's *English Literature in the Earlier Seventeenth Century* (Oxford, 1945), pp. 261-268. R. F. Jones, *Ancients and Moderns* (St. Louis, Mo., 1936), and F. H. Anderson, *The Philosophy of Francis Bacon* (Chicago, 1948), especially Chs. i, ii, and xxv, are important studies. Two significant articles discussing Bacon's science and scientists, with special reference to the *New Atlantis*, are Robert P. Adams, "The Social Responsibilities of Science in *Utopia*, *New Atlantis* and After," *JHI*, x (1949), 374-398, and Moody E. Prior, "Bacon's Man of Science," *JHI*, xv (1954), 348-370. Relevant also are the earlier articles by Geoffrey Bullough, "Bacon and the Defence of Learning," and Rudolf Metz, "Bacon's Part in the Intellectual Movements of his Time," both appearing in *Seventeenth Century Studies Presented to Sir Herbert Grierson* (Oxford, 1938). See also J. G. Crowther, *Francis Bacon: First Statesman of Science* (London, 1960). The *New Atlantis* and its portrayal of science is discussed in most histories of utopias, as noted below, *passim*.

² The rest of this paragraph summarizes a detailed comparative analysis of the two works with special emphasis on the structure of the first half of the *New Atlantis*, to be published as "Bacon's Advancement of Learning and his Utopia of Science."

³ The charges seem to be of two kinds. One emphasizes what Adams calls "the Baconian lust to make all knowledge man's province and the restless Baconian desire for perpetual new inventions and material improvements which go beyond what the Utopians or, we might add, any rational men regard as naturally 'necessary'" ("Social Responsibility . . ." *JHI*, x, 382). The other, also noted by Adams, raises questions about the autonomy of the scientists themselves. But on the latter question see Prior, *op. cit.* A typical, generally unsympathetic account is Marie Berneri's in *Journey Through Utopia* (London, 1950), p. 136. Richard Wahrhaft, "Science Against Man in Bacon," *Bucknell Review*, vi (1957-58), 158 ff., rehearses the charges, emphasizing the inadequacy of religious control and direction.

⁴ For a sampling of approaches to the *New Atlantis* in histories of utopias, see A. L. Morton, *The English Utopia* (London, 1952), p. 62: ". . . *New Atlantis* which under cover of describing a utopian commonwealth is really a prospectus for a state-endowed college of experimental science." R. Ruyer, *L'Utopie et les utopies* (Paris, 1950), p. 173: "Bacon n'annonce pas tant une société transformée par la science qu'une société où la science aura la première place, et la plus confortable." See also V. Dupont, *L'Utopie et le roman utopie dans la littérature anglaise* (Lyons, 1941), pp. 127-154; Berneri, *op. cit. supra*, n.3; Frederic White, *Famous Utopias of the Renaissance* (New York, 1955), xxi, among others.

tion and in its relations to such critical social activities as the production of goods and the education of the young. The institutional relations that reflect the structure of the society can be viewed as a plot pattern, and thus what appears first in the story and what appears at the center of the utopian space will reflect most clearly the ideology of the utopian world.⁵ One example from a contemporary utopia should suffice to make clear what we seek. Near the entrance to B. F. Skinner's *Walden II*, the most penetrating of modern scientific utopias, there is a "natural" structure, a small pool that signifies the human world. Once muddy, it now stands clear; nature has been changed by the hand of the scientist who rearranged its constituent elements into a more stable society. So long as their relationships are scientifically controlled, the inhabitants live in productive harmony. The little allegory suggests Skinner's idea of a utopia reached by means of human engineering. For Skinner, psychology, in particular his learning theory, provides the special scientific tool needed to construct an ideal society.⁶ The role of science is similarly suggested by fictional structures in Renaissance utopias. A brief glance at the image of science that emerges from More's *Utopia*, Andreae's *Christianopolis*, and Campanella's *City of the Sun* will provide a useful background against which to project the image of science in Bacon's *New Atlantis*.⁷

More's *Utopia* seems as far away as one can get from the brave new world of scientific gadgets. Though great advances toward reducing human misery and increasing human comfort have been made in *Utopia*, we see few material goods about, learn of few experiments or projects in progress. To be sure, there is no question of the inhabitants not being able to master a complex process; as the incident of the Greek books shows, *Utopia* is no primitive Eden where the natives live by shaking the palm trees. Thomas More had other solutions in mind for the problems usually solved by a beneficent nature or applied science. What Hythloday found when he stayed behind was a country organized and ruled by men who sought to create in their social relations the same order they perceived in the fabric of God's universe.⁸ Instead of saying that there was no science in *Utopia*, we may say that science was everywhere: all actions and all institutions reflected deliberate choice following "the methodical use of reason to understand a universe of natural law through direct observations and experiments and to use the knowledge thus acquired to benefit human society."⁹ We can prop-

erly call this "natural social science" a more desirable science than mere industrial technology; it does not corrupt man by pandering to his pride, sense of power, and sensual desire for comfort. Adoring the harmonies of God's universe and using them as a pattern for living according to nature is different from making the physical world the proper object and locus of man's activities.¹⁰ More's attitude toward science, pure and

⁵ I am not, however, attempting here the same kind of analysis as that undertaken by H. S. Herbruggen in *Utopie und Anti-Utopie* (Bochum-Langendreer, 1960). Dr. Herbruggen's structure principles, said to be common to all utopias, include *Isolation, Selektion der Kräfte und Idealität* and do not refer to physical structures within the utopias themselves. I also purposely avoid any introduction of materials from the history of science at this point.

⁶ Burrhus F. Skinner, *Walden II* (New York, 1948).

⁷ Inasmuch as I am not concerned here with literary genetics, I avoid all questions of order of composition and influence. Also, I reserve Burton's "own utopia" for separate analysis, though its very formlessness makes it relevant here. There are complex questions of continuing additions to the text noted by J. Max Patrick in "Robert Burton's Utopianism," *PQ*, xxvii (Oct. 1948), 345-358 and other, largely unnoted, relations to later Baconian utopists which make separate treatment desirable.

⁸ Fritz Caspari, *Humanism and the Social Order in Tudor England* (Chicago, 1954), pp. 50-51. More sought to prove, Caspari points out, that "a society could be organized on the basis of reason alone, and ruled by those who possessed it in the highest degree." Accordingly, "he eliminated . . . property, inherited social position and within limits revealed religion." He created a society of rational men "to investigate how [reason] could serve as the only basis of society, without interference from any of the other factors which traditionally influenced societies."

⁹ Adams, p. 380.

¹⁰ Wahrhaft, pp. 163 ff; Adams, pp. 384 ff. The critical passage on which Adams based his argument for natural science in *Utopia*, within his "natural-social science" formula, begins: "For though there be almost no nation under heaven that hath lesse nede of Phisicke than they, yet, this notwithstanding, Phisicke is no where in greater honour; bycause they count the knowledge of yt emonge the goodlieste, and mooste profytable partes of Philosophie. For whyles they by the helpe of thys Philosophie searche owte the secrete mysteres of nature, they thynke that they not onlye receaue therby wonderfull greate pleasur, but also obteyn great thanks and fauour of the auctoure and maker thereof. Whom they thynke, accordynge to the fassyon of other artyfycers, to have sett furthe the marvelous and gorgious frame of the worlde for man to beholde; whome onelye he hathe made of wytte and capacitye to consydre and understand the excellencye of so greate a woorke. And therefore, say they, dothe he beare more good wyll and loue to the curyous and diligent beholder and vewere of his woorke, and maruelour at the same, than he doth to him, whyche lyke a very beaste wythowte wytte and reason, or as one wythowte sense or motynge, hath no regarde to soo greate and soo wonderfull a spectacle." *The Utopia*, ed. J. H. Lupton (Oxford, 1895), pp. 217-218. Subsequent references to *The Utopia* will be to this edition. If we follow Lupton and Adams and expand "Phisicke" to mean natural philosophy or natural science, we discover that the Utopians

applied, is reflected in the temporal and spatial structures that tell the story of the kingdom of Utopia, as well as in the lessons that Hythloday teaches.

Compared to Bacon's detailed account of the history of Bensalem, More spends almost no time on the early history and founding of Utopia.¹¹ Yet we learn that though nature, craft, and art have united to make the island invulnerable to attack, the happy island is itself man-made. Utopus, the eponymous founder, formed Utopia out of Abraxa, as in an act of creation. The isthmus-cutting feat is not treated, however, as a technological triumph; nor is its message one of scientific advancement. Rather, it proclaims the power of communal endeavour. What More stresses is that the equal division of labor between conquerors and conquered alike made the channel possible and turned the early jests of the spectators to wonder and fear. This incident is the first reported action and illustrates in parable More's social philosophy.¹² Contrast the deeds of Bensalem's Altabin and Solamona in the *New Atlantis*. King Altabin, protector of his island from the invasions of old Atlantis, operates through craft to disarm the enemy and achieves victory without force. His action is the first announcement of the peace theme that runs through the *New Atlantis*. Solamona, coming later, after the island has enjoyed long peace and isolation, finds an organized and stable society; he regularizes and formalizes its procedures; turning his energies toward science, "the true riches of the kingdom," he founds Salomon's House. More's fable reads that one cannot live rationally as part of a world dominated by private property and passions, that communal endeavour is the key to social progress. Bacon's fable suggests that the progress of science depends on the prior existence of external peace and internal harmony.

If we leave the beginnings and move to the living center of More's ideal society, we find the same lack of interest in the role of science. Decentralized in its political structure, Utopia lacks a place where the tasks of science could be performed.¹³ Amaurot, its principal city, incorporates many welfare features—wide streets, drainage systems, three-story houses, hospitals, and other improvements pleasing to the city planner who loved his London. These are structures of communal living and wise governance. Outside the city, the "scientific" agriculture consists not of devices for improving the means of supply, but of rational procedures for equalizing effort and reducing demand, eliminating luxury and waste.

The state provides universal agricultural training, paternal, familial craft training, and book learning; but we find no mention of science in any form of its educational program. People, living in small groups, grow things, make things, and pursue wisdom, or at least are free to do so since they possess, as a result of their rational economy and polity, leisure to cultivate ease and improve their minds. Scientific method may be fully integrated into this society, but the institutions of science occupy no space; they cannot be seen. In sum, we do not find in Utopia any place, either isolated or centrally located, where scientific activity, as we might recognize it, is being pursued.

Compared to More's haven of felicity, Tommaso Campanella's rigidly authoritarian City of the Sun seems a singularly unpleasant place.¹⁴ We are confronted by a curious hodge-podge of mystical astrology, Platonist eugenics, military

pursue knowledge, which is otherwise of no value to them, for the pleasure they get from knowing it and for the rewards God bestows with his love and good will when they take the effort to comprehend the curious pattern of His universe. The passage does not say that among the excellencies of "the marvellous and georgous frame of the world" is its capacity to serve as a model for human, social organization. Even more important, the passage says nothing about man taking any other action beyond beholding the frame. Further, I am indebted to R. J. Schoeck for noting that the Latin text gloss *Medicina Utilissima* suggests a more restricted meaning for "Phisicke." See Adams, op. cit. pp. 377 ff., where he develops the natural-social science formula. I should like to make clear that my use of Adams' analysis as a point of departure does not imply dissent from his general position, and certainly not a failure to appreciate his contribution to the understanding of More in this and his earlier essays.

¹¹ The three-part structure of the *New Atlantis* and Bacon's use of a "flash-back" technique are discussed in the essay referred to above in n. 2. More does note that Utopia was founded 1760 years earlier. The significance of the date 244 B.C. and of its use by More has been discussed in detail by R. J. Schoeck in "More, Plutarch and King Agis: Spartan History and the meaning of Utopia," *PQ*, xxxv (1956), 366-375, esp. p. 372.

¹² See Edward Surtz, *The Praise of Pleasure* (Cambridge, Mass., 1957), p. 4 and note, on More's use of the name Abraxa.

¹³ It is, of course, not necessary for there to be a building with a sign engraved in gold letters HOME OF SCIENTIFIC METHOD IN THE IDEAL STATE. My argument is simply that the lack of an organized space in Utopia is evidence of a distinction between More's advocacy of rational procedures and the more common use of "science" as a term involving laboratory or similar operations with things.

¹⁴ I use William Gilstrap's translation, included in Glenn Negley and J. Max Patrick, *The Quest for Utopia* (New York, 1952), pp. 317-347. Subsequent references will be noted by page number only in the text itself. I am indebted to both authors for encouraging my interest in utopias and to Professor Patrick for bibliographical aid.

regimentation, anti-Aristotelian education, and hyper-rationalist welfare schemes, all administered by personified intellectual virtues serving as magistrates; the individual tends to disappear, smothered in rules and projects designed for the good of "Society."¹⁵ On the other hand, few Renaissance utopias leave one with a warmer sense of the possibilities of a rationally-organized human brotherhood than Valentin Andreae's *Christianopolis*.¹⁶ There, one is invited to enter into a cooperative communist fraternity in which highly rational Christians apply the most advanced scientific knowledge toward the solution of their social problems. My purpose, however, is not to provide a comparative analysis of the social programs of Renaissance utopias. I note only briefly here that in contrast to More's Utopia, the ideal societies of Campanella and Andreae have organized central zones in which structures and space are allotted to science, permitting us to measure in part the role assigned science among the institutions that organize those societies.

To the Genoese captain who tells Campanella's story, the City of the Sun appears suddenly on a vast plain, atop an enormous hill, surrounded by seven gigantic walls, crowned by a temple. The opening pages of the *City of the Sun* consist primarily of a detailed description of these walls (pp. 320–322). They make the inner temple the inviolable center of the ideal city; but the protection they offer is not merely military. Somewhat curiously for military structures, they lie within the jurisdiction of Wisdom rather than of "Por," Power, the magistrate responsible for matters relating to war and defense. "Sin," or Wisdom, has given them their role in the society; he has caused all human knowledge to be transcribed on them, from mathematical knowledge exceeding that of Archimedes and Euclid on the outer wall to the depiction of "all the mechanical arts, their tools and the manner in which they are practised in the various countries" on the inner wall. These are placed and described in the order of their importance, and the inventors are named (p. 322). The walls between record man's useful knowledge gleaned from all civilizations. Thus, in the structure of Campanella's utopia, the city walls provide the military strength and protection for the ideal city; they also protect the city by preserving and passing on man's knowledge.¹⁷ Knowledge, learning, science give form to the daily life of the people living between these walls. In this ideal city science appears everywhere; true knowledge has been freed for the service of mankind. Family and private property have been eliminated; selfishness, prime enemy of the polis,

has disappeared. The hierarchy of rule seems genuinely based on intellectual capacity; magistracy falls to the specialist. Yet throughout this city dominated by its walls, there is no place for exploring new knowledge; in effect, knowledge is fully known, codified, and exhibited. There are no laboratories, only museums.¹⁸ If we look at the structure of the center of the city, we can understand this paradoxical combination of a high regard for human knowledge and science together with a total lack of significant machinery for the expansion of this knowledge.

The walls which protect Campanella's city are separated from the temple by an extended open plain, as though to indicate that the enclosed and consecrated spot does not take its character from its surroundings. A small opening in the huge temple dome admits celestial light, focussing it on the altar below with its two globes, one of the heavens and beneath it one of the earth (p. 319). The temple serves as a sacred astrological institute, the home of the priests who advise Sol, the supreme ruler, and from among whom Sol is chosen. This monastic brotherhood differs from Bacon's fellowship at Salomon's House. The latter is a technical research group, isolated from its society, whose task is the remodeling of the natural environment. These priests, closely allied to the ruling power, translate their readings of heaven into social directives. Such knowledge enables them to govern the City's internal affairs, setting breeding times and harvesting times, acting generally as "intercessors and mediators between God and man." They may well "write admirable treatises and investigate the sciences," but they are primarily concerned with discover-

¹⁵ Some alternative interpretations of the *City of the Sun* are summarized in Negley and Patrick, *Quest*, p. 315. See also A. D. Franck, *Réformateurs et publicistes de l'Europe dix-septième siècle* (Paris, 1881), pp. 150–201, who regards the work as a *reductio*. On the contradictions in his works, Harold Hoffding, *A History of Modern Philosophy*, tr. B. E. Meyer (New York, 1900), pp. 157–158, writes: "This vision of the future which swam before Campanella . . . stands in a certain opposition alike to his philosophical and to the politico-religious conceptions which he developed in his other works."

¹⁶ Johann Valentin Andreae, *Christianopolis*, tr. Felix E. Held (Oxford, 1916). Subsequent references will be to this edition and will be noted in the text itself.

¹⁷ Bernardus M. Bonansea discusses the relation of Campanella's epistemology to his metaphysics, perhaps crudely figured in the walls and the city, in *The Theory of Knowledge of Thomas Campanella* (Washington, D.C., 1954), Catholic Univ. of America, Phil. Ser., Abstract 14, p. 20 ff.

¹⁸ Edgar Zilsel, "The Genesis of the Concept of Scientific Progress," *JHI*, vi (1945), 346, n. 5, notes the presence of museums but not of institutions for research in the City of the Sun. "Scientific progress and cooperation are not mentioned there."

ing guideposts for man in the influential movements of the heavens (p. 341). Moreover, no discoveries are ever made in the society at large. Nor is there any provision for expanding the walls on which man's knowledge is recorded. Campanella's idea of science is bound up with his passion for astrology: the dominant image is that of the light that shines through the small hole in the dome of the Pantheon-like temple to the globes below. Knowledge is filtered through the temple and its priests to the city below. Both ritual shrine and operating center, the temple symbolizes the authoritarian role of science in Campanella's ideal city.

Campanella's *City of the Sun* resembles More's *Utopia* in some of its social and economic criticism. Both ideal societies suggest, for example, that the abolition of private property will release and organize human energy more rationally and hence more effectively. The essential difference between them can be seen perhaps most clearly in the contrast between More's decentralized country with its farms and towns and Campanella's monolithic city with its temple open to the heavens and surrounded by its circle of walls. In neither country, however, is there a place devoted to probing the physical world. On the other hand, such a place is provided in both Andreae's Christianopolis and Bacon's Bensalem. In Christianopolis science is integrated into the life of the whole society, whereas in Bensalem scientific research is pursued in isolation from the society which supports it and is supposed to benefit, in turn, from it. The isolation and autonomy of Salomon's House is, as we shall see, the distinctive characteristic of Bacon's utopia of science. To an even greater degree than More's *Utopia*, Andreae's Christianopolis is dominated by a religious-social science; it is a Christian communist brotherhood where life according to nature corresponds to man's Christian, moral nature. More forthrightly than Campanella, who argued that "man should not become the servant of things," Andreae urges that "only those persons are rich who have all of which they have real need, who admit nothing else, merely because it is possible to have it in abundance" (p. 156). Yet Andreae does not permit his moderate asceticism to overshadow his interest in science, a practical science that has become the proper instrument of social progress and a science education that has taken its place in the ideal curriculum. For example, as we approach this ideal city, we tour the environs devoted in turn to agriculture, mills and bakeries, meats and provisions, and metals and minerals.

While passing through the first three areas, we listen to little homilies, not unlike More's, on simplicity, temperance and abundance, and communal endeavor.¹⁹ On entering the west sector, devoted to the forge, however, Andreae's account changes to direct advocacy of experimental science: "Here in truth you see a testing of nature herself; everything that the earth contains in her bowels is subjected to the laws and instruments of science." And, "If a person does not here listen to the reason and look into the most minute elements of the macrocosm, they think that nothing has been proved. Unless you analyze matter by experiment, unless you improve the deficiencies of knowledge by more capable instruments, you are worthless" (pp. 154-155). The passage is typical of the attitude toward science that pervades the city; the structures and spaces devoted to science in the city itself reflect that same attitude.

On our journey, we arrive at "the innermost shrine of the city which you would rightly call the center of the activity of the state" (p. 173). After meeting the officers of the tightly-knit, paternalistic hierarchy, we tour the buildings of the inner square, beginning with a group consisting of the library, armory, archives, printing press, and treasury. Once past these five institutions, whose activities have been turned away from the gross purposes they serve in our corrupted world, the tone again changes. We come to the laboratory where "the properties of metals, minerals and vegetables, and even the life of animals are examined, purified, increased and united for the use of the human race and in the interest of health," and then to the drug supply house whose function is to translate the truths of natural sciences into practical uses: "for what a narrow thing is human knowledge if it walks about as a stranger in the most wholesome creations and does not know what advantage this or that thing bears to man. . . . It should rather be the aim, after something has been accomplished with that theory, to prove its practical value to men; after the nomenclature of things, to recognize also the things themselves" (pp. 196-198). At the center of the city, where the power is administered, more space is devoted to scientific research and the teaching of arts and

¹⁹ Concerning the adequacy and distribution of provisions from the mills and bakeries, Andreae writes (p. 152), "You will be surprised how a supply of provisions not at all very great, can be made to suffice for temperate habits in everything. For though no one in the whole island ever goes hungry, yet by the grace of God or the generosity of nature, there is always abundance, since gluttony and drunkenness are entirely unknown."

sciences than to any other activity. Nevertheless, Christianopolis is not a utopia of science; nor is it a community dedicated exclusively to the continuous exploration of nature and the manufacture of goods, if that is a "utopia of science." It is a cooperative Christian commonwealth, dedicated to peace and the simple life. The temple, both for worship and for meetings on solemn occasions, stands at the center of the inner square, surmounted by the council hall. All the more significant, then, is the space given to scientific activity, in particular the emphasis on experiment, observations, practical testing, within the utilitarian framework. In Christianopolis, science is integrated into the life of the ideal society in a fashion far beyond what can be claimed either for More, Campanella, or Bacon. Indeed, what distinguishes the *New Atlantis* from these other Renaissance utopias is Bacon's attempt to project a vivid picture of a properly organized science research "foundation" within a framework of a politically and socially conservative and religiously orthodox society. For Bacon's purposes, the image of science needs to be kept separate from the image of society.

II

The first half of the *New Atlantis* can be likened to a long journey through religious propriety and social conservatism to the sanctuary that is the College of the Six Days Works.²⁰ As Bacon tells the story, the founding of the college antedates the coming of Christianity; in fact, the Father from the College presides over, and makes possible, the Christianization of the island; it is he who recognizes the sign, interprets the miracle. Moreover, in the pattern of the plot, both college and Christianity come to Bensalem only after the achievement of social stability and perfect polity, external and internal peace. Unlike Utopus, who first conquered and then cut off Abraxa to begin the creation of Utopia, Solamona turned his energy to endowing and creating the foundation that bears his name "in part to give perpetuity to that which was in his time so happily established," the perfect social order. Realizing the perfection the Bensalemites had already attained, Solamona moved to prevent contamination by strangers (while providing for the care and relief of occasional visitors) and to erect "Salomon's House, the noblest foundation (as we think) that ever was upon the earth . . . dedicated to the study of the works and creatures of God" (III, 145). Regardless of what Bacon might have included had he in fact gone

on to prescribe a constitution of laws, he is unlikely to have changed the history of the island. Taking its history as evidence, then, ordered political and social structure is a prerequisite for scientific advancement, as indeed for Christianity. Bacon does not show what the inventions of the college and the precepts of Christianity may have added to the quality of life in Bensalem. Bacon's purpose is not to argue a causal relationship either way—with either science or religion as the cause of peace and prosperity—but rather to show that scientific research properly pursued is not inconsonant with religious propriety and social stability; in sum, that science will not make atheists and communists of the citizens. The image of the city takes up the first half of the *New Atlantis*; the image of science emerges wholly from the second half of the tale. That image is defined as much by the site and situation of the research institute as by the procedures that go on within it.

Salomon's House is the least particularized structure in a utopian fiction notable for its lack of concrete detail. Bensalem has a port and is very large (5,600 miles in perimeter); it has at least two cities and a Stranger's House. The city we enter has fair streets, a hall where the Tirsan Feast is held, and Adam and Eve inspection pools. No doubt there are other structures. With the arrival of the Father, an unsuccessful and rather repellent attempt to picture the scientist as Royal Magnificence, Bacon provides the only detailed description in the story. But even as we do not know where we are when we are in Bensalem, we do not know where the Father comes from. The college is not at the heart or the center of the city. If it is in some central island fastness, it is as isolated from its supporting societies as the island itself is isolated from the world. Wherever it is, the college consists of "houses," i.e., experimental laboratories of all kinds, and two exhibition halls. In sum, Bacon's emphasis is on the pursuit of science, on the process, almost *in vacuo*. Salomon's House is not a place, but an operating fellowship, self-perpetuating, with novices and apprentices from we know not where and servants and support of equally unknown origin (III, 165). Taking the spatial structure as evidence, science is something men do—a way of life detached from society and its daily routines. What is done as science may well eventually

²⁰ See above, n. 2. Subsequent references to the *New Atlantis* are to the edition by J. Spedding, R. L. Ellis, and D. D. Heath, *Works* (London, 1857), and will be included in the text.

ameliorate social conditions—reduce want and increase comfort—but no single routine procedure demonstrates how science has been absorbed into Bensalemic life during these last eighteen hundred years, though many profitable inventions are said to have been published. We first learn about the importance of science in Bensalem as we approach it through its history, in the images that mark the Christianization ceremony. Except for the inspector's antiseptic orange, we see nothing, no process, no product in the city or its activities. Even the Father who comes conveys nothing that might be connected with his work. Secondly, in our journey into the city, through the city, and to the college, we see nothing, no place given over to any scientific activity, no monument of any kind. The college itself has neither form nor place that identifies it in relation to the rest of the city, only distance and activity. We do not even go to the college; we only hear about what people there have and do.

What in fact do they do at the college? What they do is well known. They seek "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" (III, 156). What they do derives wholly from turning their eyes outward to the physical world. The activities are first described in terms of their equipment and its uses. The brothers engage in mechanically reproducing natural processes, in imitations and observations of natural phenomena. The products of these activities range from artificial metals to remedies for illness. They experiment with biological phenomena in gardens "wherein they do not so much respect beauty," as the products; and in zoos with animals, and in ponds with fish. As previously they had experimented with inanimate structure, so now they push to the limits of forms of life. Next, they experiment with the goods of daily living, in bakehouses and brew-houses, dispensatories and medicine shops, manufactories for mechanical arts and clothes—in their search for the new and the exotic. Finally, in a less easily classified group, there are experimental houses—perspective houses, sound houses, perfume houses—that seek ways to extend the sensory capacities themselves. Also, there are furnaces, forges, an engine house for mechanical inventions, and a mathematical house, all concerned with expanding man's control over his environment. There are also the much commented on "houses of deceits of the senses" (III, 156–164). If we look among these activities for forecasts and prophecies of things to come, we can draw what conclusion we choose

about Bacon's role: benefactor, quack, or madman, perhaps all three. It is clear that Bacon's experimental College of the Six Days Works, where man would create another world, is but a jumble of experiments of fruit and light. Rawley is our best guide here; one has only to read through the curious experiments solitary of the *Sylva Sylvarum* to realize that Bacon's love was experiment; the kind mattered little. In a negative way, the *Sylva* reveals also how little concerned he was with social problems that might be solved by "scientific knowledge." It is worth noting that except for the publishing of profitable inventions, the only contacts between the college and the community in Bensalem are the forecasts of natural disasters and suggestions for prevention and remedy—a kind of farmers' almanac or "radio central" for the kingdom. The scientific college prefigures a foundation for experiment and observation whose activities are guided not by feedback from the social world around them, but by a ruling conviction of the value of investigating the natural world. In one sense, the college occupies no formalized place because its activities are designed to go on everywhere. But, also, one surmises that Bacon recognized that such activities could not be pursued within the social framework. The College is therefore presented as isolated from that social world. Bacon's science is rooted in the natural environment, not in the social structure.

In contrast to the practical science or the natural-social science of other Renaissance utopists, one distinctive "scientific" characteristic of Bacon's college rests in its special hierarchy of workers. Whether the history of scientific development has followed this path, or whether, in fact, knowledge can be discovered by the use of this strange ladder, is quite beside the point. Bacon was not providing what might serve as a blueprint for modern laboratory staffing, but a scheme of group activity, of men working together to increase man's store of knowledge, a schema designed to capture the imagination. Similarly, the whole collection of equipment and experiments is not itself an operating plan, but "a model or description of a college instituted for the interpreting of nature and the producing of great and marvellous works for the benefit of man," that is, a model of what can be done if the conditions are optimum.²¹ So, too, the collecting, sift-

²¹ I consciously give Rawley's term a contemporary meaning. Utopias present models in the sense that they exhibit the possible working relations between institutions, not in the sense that they provide exhibits to scale of parts of the social structure.

ing, axiomizing, and generalizing, is not so much a formula for this group of men to follow as an image of man's collective search for knowledge. Given the opportunity to exercise his power over nature, that is, freed from the constraint of ignorant zealots, on the one hand, and instructed in the proper method, on the other, man can discover the inner secrets of God's universe and so "enlarge the bounds of Human Empire." The organizational ladder thus contributes not only a methodological critique, comparable to that which appears in *The Advancement* and more fully in the *Novum Organum*, but also a sense of the division of labor necessary for progress. Like Andreae, Bacon might have included a straightforward lecture on method;²² instead he personifies the steps in his system, giving the reader an opportunity to see a place in the ideal scheme of things for himself and for all others devoted to the idea of man's progress. Those dedicated to such activity carry on the work described among "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," and the successful among them, inventors and discoverers, are honored and have their memories perpetuated in statues raised to them in the halls of the College (III, 166).

In the utopias of Andreae and Campanella, science as the pursuit of knowledge was intimately connected with education, the transmission of knowledge and the training of the future citizen. Though it is always dangerous to speculate about omissions from utopias, the total lack of all mention of education either in Bensalem or in the College merits attention, particularly since Bacon had spoken so fully of the necessary *opera basilica* in the preface to *The Second Book of the Advancement*.²³ Some of those recommendations are included in the College itself, but none that reflect his deep concern for collegiate education. The omissions may be explained in part by recognizing that when he came to write what he did of the *New Atlantis*, Bacon's attention was turned wholly to the discovery rather than to the transmission of knowledge. More relevant to our analysis of the *New Atlantis* as a fiction, formal science education does not appear in that work because it was not possible within the limits of his story to show a place where knowledge was being transmitted. No place existed for education in the city and no need for it at the college. To have described an educational institution in the city would have required Bacon to comment on the

role of scientific education, as distinct from research, in the society. Bacon was anxious to avoid that problem. In addition, describing a college in the city would have involved describing its curriculum, another subject that would have turned attention from his research institute. Moreover, Bacon needed the space of the city to provide the proper perspective for the entrance to the college. As we approach the sacred center of science, the holy college of creation, we see it through the images of sanctity, security, and propriety that define its supporting city.

There is no institution devoted to the transmission of knowledge at the College because the process of discovery is its sole function. Its achievements are passed on to the community as profitable inventions. It does not deal in learning, but in science; not in what is known, but in what is to be discovered; above all, in *how* it is to be discovered. We should have known this from the isolation of the College; regardless of what activity it was engaged in, the college could not be concerned with education. Such institutions must be located in or near the city itself; at least, well-articulated lines of communication and control must be clearly established. Our view of Salomon's House shows us rather what we assume to be the apex of a societal pyramid, at least some vertically oriented diagram; how the distance between the apex and the base is organized we can only speculate upon.

Unlike the centrally located and closely integrated "science" centers of Christianopolis and the City of the Sun, Salomon's House was not built near any power structure; nevertheless, the Fathers do exercise some power. They are not rulers of men and states, nor are they advisors to such rulers. Nature is their subject and mastery of her secrets their source of power. Their position resembles slightly that of Campanella's priests, but they are far more remote, separated and unlocated, and their occasional advices are not to be compared to daily consultations. Twelve-year visits hardly qualify as channels of control. Nor do Fathers become rulers. The critical issue of their isolation lies not in possible authoritarian power but in their autonomy. The crux is that they alone decide what shall be done

²² See above, p. 496.

²³ In the opening to *The Second Book of The Advancement*, Bacon speaks of the need for collegiate endowment, for research facilities, for readerships and lectureships, for new books and new editions of old books—all these and more in a spirit that suggests not only broad support but close integration of these new works into the educational system. He would not only introduce the new but also reform the old.

with their discoveries.²⁴ The brotherhood "have consultations, which of the inventions and experiences which we have discovered shall be published, and which not; and take an oath of secrecy, for the concealing of those we think fit to keep secret: though some of those we do reveal sometimes to the state, and some not" (III, 165). Three groups are involved: the Brothers, the rulers (in the Latin referred to as King and Senate), and the public, the latter having no policy-making claim whatsoever. Though the brotherhood seems to recognize some responsibility to the rulers, Salomon's House is certainly no state-run, state-owned research laboratory. In the fable, the isolation suggests that the independent pursuit of knowledge, endowed but not controlled by society, committed to the glory of God and the relief of man's estate, but not subject to the irrational wills of the unenlightened, offers the best formula for both society and science. This peculiar isolation of the enclosed and separated, the sanctified "play" space which Salomon's House occupies in Bensalem,²⁵ stands in sharp contrast to the integrated structuring of the central zone by Campanella and Andreae; all three are to be contrasted to the decentralized pattern of More's vision. The temporal and spatial structures by which Bacon describes his society, the contrast makes clear, reveal no society at all. Except for the vaguest hints, there is no city to be seen. The structures which define Bacon's ideal world belong almost wholly to myths which tell the story of the growth of science, that is, define the conditions necessary for its progress, and to the College of the Six Days Works, which defines the ideal process for discovering the secrets of the world.

Seen in this perspective, against the structures which define the role of science in Utopia, in Christianopolis, and in the City of the Sun, the isolation of the college and the autonomy of its brotherhood emerge as the distinctive elements in Bacon's image. The process of discovery and invention that is Salomon's House dominates the forefront of the image and constitutes the core of Bacon's idea of science: "a great building erected stone by stone through the work of his predecessors and his contemporary fellow-scientists, a structure that will be continued but never completed by his successors."²⁶ What made the image so powerful was the creation of a separated place whose inhabitants had no other function in the city, and a class whose activities played no direct part in the daily routine of

society. To this institution he also gave a large measure of autonomy, so that as a self-directing group the brotherhood also generated values. While it is certainly true that isolation from other societies is characteristic of most utopias, the isolation of this elite and the institution it operates within its own society constitutes Bacon's unique contribution to Renaissance utopian speculation.

More directly than he did in the discursive arguments of *The Advancement* and the essays connected with the *Novum Organum*, Bacon considered in the *New Atlantis* the role of science in the society that supports it. Though he sought primarily to exhibit the College of the Six Days Works, that is, the process for discovering and remaking the physical world to satisfy man's needs, the fictional structure of the *New Atlantis* forced Bacon to give the college a concrete structure, a site, and a situation in an imagined society. The long first half of this work seeks to assure the zealots of God and the zealots of Caesar that the values of Salomon's House will be consonant with theirs. No other utopist needed such a long fable because no other removed the structure of knowledge, learning, or science so far from the community at large. We tend, and properly, to read the isolation and the autonomy as saying that Bacon sought to separate political power from scientific knowledge for their mutual protection. But we can also read the arrangement of these structures to say that so far as science is creative discovery, it cannot flourish within the shadow of places devoted to other purposes.²⁷

PORTLAND STATE COLLEGE
Portland 1, Oregon

²⁴ Concern about the autonomy is not limited to our own time. In the preface to his edition of the *Works* (London, 1737), Peter Shaw wrote: "Perhaps the Reserve of a Power of withholding certain discoveries from the State, though a thing in itself extremely wise and prudent (because Governors are not always good moral philosophers), may be the greatest Objection against the founding of such a college as is here modell'd out." See articles by R. P. Adams and M. E. Prior listed in first note.

²⁵ On the consecrated play space, see J. H. Huizinga, *Homo Ludens* (Boston, 1955), p. 10. But see also Huizinga's comments on the limited play element in science (pp. 203-204). The special place fits well with the theory of utopian construction suggested by R. Ruyer in *L'Utopie et les utopies* (Paris, 1950), pp. 3-27.

²⁶ Zilsel, p. 325.

²⁷ I am indebted to the Charles A. Weyerhauser Memorial Foundation for an opportunity to study seventeenth-century utopias. I note also a debt to Mr. F. M. Rarig, Jr.