THE PROBLEM OF ESOTERICISM IN BACON'S SCIENCE

PROBLEMA EZOTERISMULUI ÎN ŞTIINŢA BACONIANĂ

Grigore VIDA
Faculty of Philosophy
University of Bucharest, Romania
grigore.vida@gmail.com

Abstract
Francis Bacon is commonly regarded as someone who shifted arcane knowledge into the public domain (and dispelled the aura of secrecy that surrounded the gestating 'Baconian sciences', to use Kuhn's term) – a general movement of the seventeenth century in which he plays an important part. He contributed thus to our present image of science as an open, public enterprise. By focusing on the 'New Atlantis', as well as on other texts, I try to show that Bacon's science is still esoteric, while esotericism is not to be understood as some form of obscurantism, but as having a positive function, namely the protection against the dangers that the advancement of knowledge (power) implies. Esotericism appears to be somehow inescapable even to modern science; the motivations behind it are involuntary as well as voluntary, a double aspect that I will try to point out in Bacon as well.

Key words: *history and philosophy of science*; *Francis Bacon*; *Baconian science*; *esotericism*.
Cuvinte cheie: *istoria şi filosofia ştiinţei*; *Francis Bacon*; *ştiinţa baconiană*; *ezoterism*.

Introduction

Thomas Kuhn famously distinguished between a seventeenth-century group of 'classical sciences' such as astronomy, optics, statics, harmony (theory of music), which had been developing since the Antiquity under the label of 'practical (mixed) mathematics', which conferred them a certain unity, and a cluster of much more disorganized 'Baconian sciences', gestating during the sixteenth century and leading, after their full emergence, to a new experimental approach to phenomena such as magnetism, electricity, heat and chemical reactions. [1] But what would the 'Baconian sciences' have looked like to Bacon himself? They were certainly not taught in the universities, they lacked the official status of the 'classical sciences' and they were, instead, the business of non-academic figures such as alchemists and magicians or craftsmen, metallurgists, artisans, mechanical engineers and so on. An essential feature of these people was the practical character of their activity; they were all, in one way or another, engaged in "mastering nature". However, one other thing that they had in common was the secrecy surrounding their labor. Secrecy was a *sine qua non* of alchemy, magic and other occult practices that were protecting themselves from getting in the wrong hands, with supposedly disastrous effects, while in the case of crafts, secrecy was needed in order to maintain the 'how-to' skills in a family or, later, in a guild, that depended on such technological knowledge ("art") for its subsistence and that, consequently, regarded it as a private property which is not to be shared with others. [2] From a general view-point, secrecy has always the role of separating an outside from an inside, conferring autonomy to the latter and setting the border between the 'few chosen' and 'ordinary people'; access to knowledge differentiates people socially as much as epistemologically in a value-system where the more hidden, the more precious. [3]

The era that was the most passionate about secrecy was the Renaissance and this general trend was motivated by a certain disenchantment with scholasticism, while the search for an ancient, lost wisdom looked much more promising. Bacon certainly despised the teachings

professed in the Schools and he tirelessly criticized the scholastic entanglement in useless debates that were in no way advancing learning, but just hindering it. Instead, the dynamic of the mechanical arts, for instance, which flourished during the Renaissance, was much more appealing to him, although they were not perfect either. Alchemy and natural magic had also attained useful results, although in the manner of the sons who dug the earth in search of gold, following their father's vain promise. All this had to be reformed, Bacon always claimed; chance discoveries and isolated individual successes were to be replaced by an enterprise guided by a method, a plan and, most importantly, put into practice by a community of learned people that were efficiently collaborating in order to produce an outcome not for some individuals or nations, but for human welfare in general: science.

So Bacon was considered to be a major actor in the transformation of arcane knowledge into public science, a fundamental change that characterizes the seventeenth century in general. Descartes famously appealed to the 'common sense' that most people possess, while Bacon proposed the equally famous "leveling of wits" [4]; Mersenne criticized the alchemists for their allusive, enigmatical language [5] and so did Gilbert [6] (taking into account only the beginning and first half of the century). The new science had to be clear and accessible to any ordinary man who wanted to access it; it was, thus, a great democratizing process [7], in which the major figures of the age unanimously rejected the distinction between the few chosen and the ignorant rest. [8]

The collaborative character of Baconian science has usually been invoked to sustain the idea that his plan for reforming and advancing learning is an open and democratic one: "[…] Sir Francis Bacon, who put forth a powerful argument for the idea that knowledge would be most efficiently advanced by cooperative endeavor. Since science had to be grounded upon a new foundation of reliable factual information, Bacon argued, it needed the ordinary talents of many investigators rather the uncommon genius of a few. The project of assembling the great Baconian natural history required a spirit of openness among investigators. If individual discoverers jealously withheld their «secrets» from the public, that collaborative enterprise would certainly fail." [9] The institutional setting he was devising was: "[…] the price one paid for shifting natural philosophy out of the realm of arcane knowledge into the public domain." [10]

I don't want to deny that Bacon's ideas played a crucial role in establishing the open character of science and its professionalization. But I claim that Bacon's own texts sustain an image of science that is more esoteric than exoteric, while esotericism has, I will argue, a positive function. The universalist reading of Bacon cannot be denied to his Puritan followers of the 1640s, as well as, later, to some of his admirers at the Royal Society; however, with an eye to the *New Atlantis* as well as to other texts, I think that Baconian science can be honestly described as esoteric.

First I want to investigate the passages that are enabling an 'exoteric' reading of Bacon and afterwards I will argue for an 'esoteric' perspective that tries to also integrate the first part.

The 'exoteric' reading of Lord Verulam

One of the constant features of Bacon's thought is his conviction that a real progress in knowledge is to be achieved by a collaborative effort of a community. His visions were always large and he hoped that such a community will gain financial and institutional support from the royal authority, so that it would develop into a grand scale project. From the device performed at Gray's Inn for the entertainment of Queen Elisabeth up to the dedications to King James, his message for the royalty is clear: collaboration, at all levels, is the key for the advancement of learning. [11]

Bacon does not value outstanding intellects that are supposedly able to bring major contributions all by themselves. When interpreting the last part of the fable of Prometheus in *De sapientia veterum*, he stresses the idea that a person who is more gifted than others actually fails the task as well as the one with low skills, whereas a succession that is not disturbed accomplishes the job: "[…] that the perfection of the sciences is to be looked for not from the swiftness or ability of

any inquirer, but from a succession. For the strongest and swiftest runners are perhaps not the best fitted to keep their torch alight; since it may be put out by going too fast as well as too slow." [12]

It is not the extreme that Bacon is interested in, but the 'middle way'. [13] So he rejects the excellence of intellects and points instead to a leveling of wits as the most successful process of advancing knowledge; he does this most famously in the *Novum organum*: "But the course I propose for the discovery of sciences is such as leaves but little to the acuteness and strength of wits, but places all wits and understandings nearly on a level." [14]

Comparing the mechanical arts with philosophies and sciences, the superiority of the former results precisely from their cumulative nature that implies the work of many minds through time: "For hence it hath comen that in arts mechanical the first deviser comes shortest, and time addeth and perfecteth; but in sciences the first author goeth furthest, and time leeseth and corrupteth. So we see, artillery, sailing, printing, and the like, were grossly managed at the first, and by time accommodated and refined; but contrariwise the philosophies and sciences of Aristotle, Plato, Democritus, Hippocrates, Euclides, Archimedes, of most vigour at the first, and by time degenerate and imbased; whereof the reason is no other, but that in the former many wits and industries have contributed in one; and in the later many wits and industries have been spent about the wit of some one, whom many times they have rather depraved than illustrated." [15]

To put individual capacities together is the only way to gain results efficiently: "For then only will men begin to know their strength, when instead of great numbers doing all the same things, one shall take charge of one thing and another of another." [16]

Bacon is also concerned to eliminate any theological restriction that would impede inquiries about nature; there is no forbidden knowledge for the natural historian. In order to do this, he has to reinterpret the myth of the Fall and to disengage curiosity, the vice that made man break God's interdiction, from its association with the quest for natural knowledge [17]: "My first admonition […] is that men confine the sense within the limits of duty in respect of things divine: for the sense is like the sun, which reveals the face of earth, but seals and shuts up the face of heaven. My next, that in flying from this evil they fall not in the opposite error, which they will surely do if they think that the inquisition of nature is in any part interdicted or forbidden. For it was not that pure and uncorrupted natural knowledge whereby Adam gave names to the creatures according to their propriety, which gave occasion to the fall. It was the ambitious and proud desire of moral knowledge to judge of good and evil, to the end that man may revolt from God and gives laws to himself, which was the form and manner of the temptation. Whereas of the sciences which regard nature, the divine philosopher declares that «it is the glory of God to conceal a thing, but it is the glory of the King to find a thing out»." [18] Bacon is turning enemies into friends and natural knowledge becomes the most reliable ally of religion, helping man to regain his prelapsarian status; this rhetoric will become very common later in the seventeenth century, together with a serious development of the "argument from design", on which Bacon himself does not rely so much.

What is then the true impulse behind science? Nothing else than the Christian virtue of charity, of which there can be no excess. Bacon's scientist is a pious person, a philanthropist who, in his great charity, works for the benefit of the human race. [19] When Bacon refers to the rightful end of knowledge, one of the answers that appears repeatedly is that "[...] the true and lawful goal of the sciences is none other than this: that human life be endowed with new discoveries and powers." [20]

In this quest for the common welfare, Bacon seems to leave the door open for everybody: "[...] I ask them to deal fairly by their own interests, and laying aside all emulations and prejudices in favour of this or that opinion, to join in consultation for the common good; and being now freed and guarded by the securities and helps which I offer from the errors and impediments of the way, to come forward themselves and take part in that which remains to be done." [21]

Putting all these pieces together, a very nice image of the Baconian science emerges: it is a collaborative enterprise in which people have given up their solitude so that they can work together for the general benefit, being motivated by charity and released of obscurantist concerns; moreover,

Bacon invites his readers to join this wonderful association that sets intellects on the same level, and to take part in this great restoration of the fallen man.

The 'esoteric' reading of Lord Verulam

To begin with the last quote, where Bacon calls for a democratic gathering of well-motivated people, I think that, since it comes at the end of the 'Praefatio' to *Instauratio magna*, we can reasonably take it as a triumphal speech that wants to create enthusiasm. Other passages in Bacon tell us a different story. For instance, in his only autobiographical piece, the 'Prooemium' to *De interpretatione naturae*, he clearly mentions the division between what is going to circulate from mouth to mouth and what is destined for a selected public; Bacon also takes care to distance himself from those who use this distinction in order to hide their imposture: "Now for my plan of publication – those parts of the work which have it for their object to find out and bring into correspondence such minds as are prepared and disposed for the argument, and to purge the floors of men's understandings, I wish to be published to the world and circulate from mouth to mouth: the rest I would have passed from hand to hand, with selection and judgment. Not but I know that it is an old trick of impostors to keep a few of their follies back from the public which are indeed no better than those they put forward: but in this case it is no imposture at all, but a sober foresight, which tells me that the formula itself of interpretation, and the discoveries made by the same, will thrive better if committed to the charge of some fit and selected minds, and kept private." [22]

The discussion about exoteric and esoteric or 'acroamatic' teaching reappears in an important passage of *De augmentis scientiarum*; the deficiency of this 'method' does not lie in itself, since the ancients used it successfully, but in its usage by the moderns, guilty (again) of imposture: "Let the one then be distinguished as the *Exoteric* method, the other as the *Acroamatic*; a distinction observed by the ancients principally in the publication of books, but which I transfer to the method of delivery. Indeed this acroamatic or enigmatical method was itself used among the ancients, and employed with judgment and discretion. But in later times it has been disgraced by many, who have made it as a false and deceitful light to put forward their counterfeit merchandise. The intention of it however seems to be by obscurity of delivery to exclude the vulgar (that is the profane vulgar) from the secrets of knowledge, and to admit those only who have either received the interpretation of the enigmas through the hands of the teachers, or have wits of such sharpness and discernment as can pierce the veil." [23]

It appears that Bacon does not have a problem with the esoteric-exoteric distinction *per se*, but only with the abuse of it by the impostors. Otherwise, he accepts the division and considers it useful for his own purposes. A selection of 'fit minds' is required for Bacon's project and the ancient 'acroamatic method' is actually well-suited for this. Its intentions were righteous, but it was badly put into practice; however, in the reformed version of the 'method' (restored to its original meaning), this error is removed.

The division between the '"crowd of learners" and the "sons of science" is made evident in Bacon's description of the 'magistral'- initiative pair that is said to have some resemblance to the other, but is in fact quite the contrary to it [24]: "Let the first difference of Method then be this: it is either *Magistral* or *Initiative*. Observe however that in using the word «initiative», I do not mean that the business of the latter is to transmit the beginnings only of sciences, of the former to transmit the entire doctrine. On the contrary I call that doctrine *initiative* (borrowing the term from the sacred ceremonies) which discloses and lays bare the very mysteries of the sciences. The magistral method teaches; the initiative intimates. The magistral requires that what is told should be believed; the initiative that it should be examined. The one transmits knowledge to the crowd of learners; the other to the sons, as it were, of science. The end of the one is the use of knowledge, as they now are; of the other the continuation and further progression of them." [25]

Contrary as the two types of method (exoteric-'acroamatic' and 'magistral'-initiative) might be, they both have in common a selective character. The problem of the selection of the public

becomes very important for Bacon especially in the crucial last years of his life, when he is rewriting and rethinking the project of the 'Great Instauration'. Dana Jalobeanu has called attention [26] to the importance that the problem of the transmission of knowledge has for Bacon at this final stage; in revising his works, Bacon is always aware that knowledge is to be delivered in accordance with the level of the public. Maybe this is a sign of the realism for which he has been praised. [27]

Communicating teachings involves a serious process of selection to be done by the teacher. One fundamental criterion of the selection is the mental state of the knowledge-receiver, in particular, his success in liberating his mind from the idols; Baconian induction cannot function in an intellect that is clouded by *idola*. But this is even more stringent in the case of the knowledge-deliverer. The status of teacher presupposes, of course, that he has done already some heavy purging of the mind, way beyond his pupils.

Putting the teacher Bacon aside, what I am interested in are the practitioners of science that he imagines in the *New Atlantis*, the members of Salomon's House. Only at the highest level, that of a 'Father of Salomon's House', is someone in a position to deliver an account about the "eye of the kingdom", and he does this to an audience which is so heavily selected that it comes to consist of only one single sailor. The small number of receivers parallels the small number of deliverers. Only at the top of the hierarchy are there the "interpreters of nature" who establish axioms trough induction and it is only they who get to know all the secrets. A strongly meritocratic division of labor rules Salomon's House, in which each member has his place according to his capacities and skills. There is nothing more remote to the democratic call that ends the 'Praefatio' to the *Instauratio magna* than the organizational structure of Salomon's House.

But how is then the "leveling of wits" to be understood? Certainly not in the sense that every intellect will be the same. A teleological perspective might throw some light on the matter: just like an organism in which organs of various degrees of importance work together for the same purpose, so too, the members of Salomon's House participate, each according to his capacities and variously distributed, in the production of the great outcome, science. Their endeavours being directed towards a single end, a certain unified enterprise is achieved, in which each part is equally necessary, while at the same time their vertical arrangement is preserved.

What about the collaborative nature of Bacon's project, the one that was thought to imply the public character of his science? The truth is that a secret society also presupposes collaboration. [28] This seems to be the case with Salomon's House; they collaborate in order to do science, but this does not mean that all results are simply made public after their discovery. Salomon's House bares little resemblance to a modern scientific institution; Eamon notes its affinity rather with Girolamo Ruscelli's *Accademia Segreta*. [29]

However, secrecy is not kept on the island of Bensalem just for the sake of it, but I think it has a positive function, so that we should not take it as a form of obscurantism.

The positive function of secrecy in the *New Atlantis*

One of the puzzling effects that utopias in general have is that in trying to present a perfect society, they create a certain impression of dystopia (the dystopian aspects of the *New Atlantis* have also attracted interpreters [30]). Something seems not to be in order with people that are only do good things: they appear to be lacking freedom, the freedom to do evil.

So how does Bacon address the moral issue in his utopia? Why does the herald proclaim that "Happy are the people of Bensalem"? [31] How come that the Fathers of Salomon's House are such good persons? I think that the problem of secrecy has to do with all these things, and esotericism has the function of preserving only the good outcomes of science, this superior form of knowledge that comes together with a great amount of power, one that has to be somehow restricted.

The whole fable of the *New Atlantis* is a progressive unraveling of secrets [32]. Secrecy defines the general atmosphere of the island. This is one of the first things made clear by the

governor of the House of Strangers: "We of this island of Bensalem […] have this; that by means of our solitary situation, and of the laws of secrecy which we have for our travelers, and our rare admission of strangers, we know well most part of the habitable world, and are ourselves unknown." [33]

The wise king Solamona is said to be at the origin of the secrecy laws: "[...] amongst his other fundamental laws of this kingdom, he did ordain the interdicts and prohibitions which we have touching entrance of strangers". [34] In contrast with the similar Chinese laws, the Bensalemite ones had a positive effect on the island.

But if everything is so secret, how come that the sailors get to know so many things about Bensalem? Why do some figures of the island decide to abandon silence and practically break the law? One way to understand this is to take into account that the sailors undergo a serious process of selection, so that, in the end, only one sailor out of fifty-one receives the entire story. It may be that the mysteries of Bensalem are not kept hidden just for the sake of secrecy; they could be accessible to anyone who proves worthy of them.

What exactly the criteria of the selection are is not altogether clear. There are some requests that each one of the fifty-one sailors has to meet: "If ye will swear (all of you) by the merits of the Saviour that ye are no pirates, nor have shed blood lawfully nor unlawfully within forty days past, you may have licence to come on land." [35] Afterwards, they have to spend three days in the House of Strangers; the narrator tells them what the safest thing to do is for all of them during this time: "[…] in regard of our deliverance past, and our danger present and to come, let us look up to God, and every man reform his own ways. […] let us not bring that confusion of face upon ourselves, as to show our vices or unworthiness before them. […] let us so behave ourselves as we may be at peace with God […]." [36] After all, a sailor's life might not be an ethical standard [37], so they have to take this 'break' before going further. The reasons for the other steps of selection are not known. It is certain that the basic criteria have a moral and religious nature; hence we might conjecture that the last person is the most moral and pious, being fit to know the secrets of the House of Salomon.

But most of all, secrecy surrounds the activity of Salomon's House: "And this we do also: we have consultations, which of the inventions and experiences which we have discovered shall be published, and which not: and take all an oath of secrecy, for the concealing of those which we think fit to keep secret: though some of those we do reveal sometimes to the state, and some not." [38] They Fathers are placed even above the state; the island of Bensalem is literally a scientocracy. Why cannot things go wrong with them?

If Bacon's scientist were not a highly moral and religious person, he would not be doing science in the first place. He must not only clear his mind of idols, but also of temptations (like pride and lust) and cultivate charity and piety. [39] Again, the ever decreasing group of the sailors parallels the restrictive hierarchy of Salomon's House: the most virtuous sailor gets to know the secrets from one of the most virtuous members of the college.

The problem of the relation between science and religion in Bacon is a complicated one and to see the former as presupposing the latter is just one way to consider it. For David Spitz [40], for instance, the Fathers of Salomon's House are above religion also, in a scheme (reminding of Auguste Comte's tripartite stages) in which religion (represented by the Governor of the House of Strangers) is surpassed by philosophy (Joabin the Jew), with science coming at the top (the Father of Salomon's House). However, one important aspect that Spitz does not mention is the fact that, after a long day of experiments, the members of Salomon's House give prayers to God, so that he may reveal to them more and more of nature's secrets. They still recognize God as the highest authority, even though the priests themselves, such as the Governor of the House of Strangers, have a lower rank.

So the members of Salomon's House reveal the scientific discoveries they make only according to their high moral and religious standards. If it is for a good cause, like curing diseases, they do not hesitate to make them public. But since (natural) knowledge means power, the truths

they discover have to pass their moral/religious filter, so that they do not cause disasters. Secrecy prevents such things from happening and that is why it is associated with the island's general welfare. Far from being the forefather of the technocratic civilization that eventually led to the atomic bomb (as he has been accused [41]), Bacon is the first to be aware of the social responsibilities of science. [42]

Conclusion

In our modern days, when we think about scientific knowledge, one of the major features that we associate with it is its public character. There is nothing more free-access than a major formula that describes the physical universe, neither does it require divine election or ritual initiation in order for it to be understood. Once it is published, scientific knowledge becomes public good; we would not speak of science anymore if it were otherwise. Openness lies at the heart of the scientific enterprise and establishes its identity. It means also that scientific results are open for testing and reevaluation; science has nothing to hide and fears not even refutations. [43]

This is the nice story about science; however, things are more complicated. Science has to be available to anyone in order to be science, but in practice there is a wide gap between the practitioners of science and the rest of the world. Mathematics is in principle accessible to anyone who possesses reason, but still not everybody is a mathematician. An article in a scientific journal is public, but how many will ever read it? To be sure, the vast majority of people have really no idea about what is going on in a scientific laboratory (for instance). It is a fact that science is done by a limited community that has certain values and rules; it is also a community that establishes what counts as science, what is the right interpretation of an experiment and, generally, what constitutes "objectivity". [44] Once you're a 'specialist', you speak the language of the community, hardly understood by others, and share its norms, integrating yourself into an autonomous establishment. You will not be bothered by non-specialists from other domains, since the community is self-regulating and protective against intruders. Esotericism implies essentially being within [45] (something); so we may find, somehow surprisingly, that science and esotericism are not as far away from one another as it might appear at first sight. [46] The reasons behind this esotericism have to do with the epistemic skills of individuals and they also have a non-intentional character.

However, there is scientific knowledge that is voluntarily kept hidden; this is obvious when we think of the status of some scientific discoveries during the Second World War, or the Cold War. It is also evident in the alchemist's deliberate effort to encode his experiments in an enigmatic language that reveals its meanings only to an initiate; it could otherwise reach improper hands, like the "sorcerer's apprentice" or some people who want simply to get rich by producing gold. The voluntary type of secrecy had largely a protective role against the danger implied by the uncovering of nature's secrets.

To put it in Bacon's words, "[...] some things are secret because they are hard to know, and some because they are not fit to utter." [47] I think we can find this double motivation of esotericism in Bacon, although he is considered to be one of those who shifted arcane knowledge into open science. On the one hand, he is very concerned with the actual public that will receive his message, its readiness for the reform of knowledge he is proposing. On the other hand, he is aware of the necessity of a protection by means of secrecy against the unabridged power that knowledge about nature unleashes; he very acutely acknowledged this truth that has become so evident in our days that we must admit that we are living in 'Bacon's era'.

References

1. Kuhn, T. S., 'Mathematical versus Experimental Traditions in the Development of Physical Sciences' in Kuhn, T.S., *The Essential Tension*, University of Chicago Press, Chicago, 1977, pp. 31-65.

2. See also McMullin, E., 'Openness and Secrecy in Science: Some Notes on Early History', in *Science, Technology & Human Values* 10, 2 (1985), pp. 15-16.
3. Simmel, G., 'The Sociology of Secrecy and of Secret Societies', trans. by Small, A. W., in *The American Journal of Sociology* 11, 4 (1906), pp. 441-498.
4. Descartes, R., *Oeuvres de Descartes*, ed. by Adam, C. & Tannery, P., 11 vols., Vrin, Paris, ³1996, vol. VI, p. 1.
5. Mersenne, M., *La vérité des sciences*, chez Toussainct du Bray, Paris, 1625, p. 105.
6. Gilbert, W., *De magnete*, trans. by Mottelay, P. F., Dover Publications, New York, 1958, p. L.
7. Cohen, I. B., *Revolution in Science*, Harvard University Press, Cambridge/MA, 1985, p. 147: "Anyone who understood the art of making experiments could test the truths of science – a factor which completely differentiated the new science from traditional knowledge […]. Furthermore, the method could be easily learned and would then permit anyone to make discoveries or find new truths. It was thus one of the greatest democratizing forces in the history of civilization. Discovery of truth no longer was vouchsafed to a chosen few – men and women of special grace or with unusual gifts or mind."
8. Rossi, P., *The Birth of Modern Science*, trans. by Ipsen, C. N. and Ibsen, C., Blackwell, Oxford, 2001, p. 18: "[…] the controversial force found in so many of the theories advanced by the so-called founders of the modern world: they unanimously rejected the idea upon which […] secrecy was founded; namely, the difference between the learned few, or «true man», and the *promiscuum hominum genum*, or ignorant masses."
9. Eamon, W., *Science and the Secrets of Nature*, Princeton University Press, Princeton, 1994, p. 319.
10. Gaukroger, S., *Francis Bacon and the Transformation of Early-Modern Philosophy*, Cambridge University Press, Cambridge, 2001, p. 160.
11. See also Sargent, R.-M., 'Bacon as an advocate for cooperative scientific research' in Peltonen, M. ed., *The Cambridge Companion to Bacon*, Cambridge University Press, Cambridge, 1996, pp. 146-171.
12. Bacon, F., *The Works of Francis Bacon,* ed. by Spedding J., Ellis R. L., Heath D. D., 14 vols., 1870, Garrett Press, New York, 1968 [reprint] vol. VI, p. 753 [hereafter: WFB].
13. See also the interpretation of the fable of Icarus, Scylla and Charybdis (WFB VI, 676-677).
14. WFB IV, 62- 63.
15. *The Advancement of Learning*, WFB III, 289-290.
16. *Novum organum*, WFB IV, 102.
17. See Harrison, P., 'Curiosity, Forbidden Knowledge, and the Reformation of Natural Philosophy in Early Modern England', in *Isis* 92, 2 (2001), pp. 265-290; Harrison, P., 'Original Sin and the Problem of Knowledge in Early Modern Europe', in *Journal of the History of Ideas* 63, 2 (2002), pp.239-259.
18. 'Praefatio' to *Instauratio magna*, WFB IV, 20.
19. See Prior, M. E., 'Bacon's Man of Science', in *Journal of the History of Ideas* 15, 3 (1954), pp. 348-370; Harrison, P., 'Curiosity, Forbidden Knowledge, and the Reformation of Natural Philosophy in Early Modern England', in *Isis* 92, 2 (2001), pp. 279-282.
20. *Novum organum*, WFB IV, 79.
21. 'Praefatio' to *Instauratio magna*, WFB IV, 21.
22. WFB X, 87.
23. WFB IV, 450.
24. WFB IV, 450: "Another Method […] which in intention has an affinity with the former, but is in reality almost contrary."
25. WFB IV, 449.
26. Jalobeanu, D., 'The fascination of Solomon's House in seventeenth century England', in Alexandrescu, V. ed., *Branching off: The Early Moderns in quest of the unity of knowledge*, Zeta Books, Bucharest, 2009.

27. Bacon is called a 'realist' by no other than Friedrich Nietzsche (*Ecce homo*). On the other hand, his failure to gain institutional support for his plans was related to the unrealistic character of them [see Gaukroger, S., *Francis Bacon and the Transformation of Early-Modern Philosophy*, Cambridge University Press, Cambridge, 2001, p. 163]
28. Thanks to Jalobeanu, D. for discussing this point.
29. Eamon, W., *Science and the Secrets of Nature*, Princeton University Press, Princeton, 1994, p. 323; on Ruscelli's 'Accademia' see Eamon, W., 'The Accademia Segreta of Girolamo Ruscelli: A Sixteenth-Century Italian Scientific Society', in *Isis* vol. 75, 2 (1984), pp. 372-342; on the other hand, for Yates, Bacon's attitude towards secrecy distances him from the Rosicrucians: "Another great difference in outlook between Baconian and Rosicrucian schools of thought is Bacon's deprecation of secrecy in scientific matters, his attack on the long tradition of the alchemists of concealing their processes in incomprehensible symbols. Though the Rosicrucian manifestos advise, as does Bacon, an exchange of knowledge between learned men, they are themselves couched in mystifications, such as the story of the cave in which Rosencreutz's body was found, and which was full of geometrical symbols. […] This atmosphere is the opposite of that in which the Baconian manifestos move, and it is precisely his abandonment of magico-mystical mystification technique which makes Bacon's writings sound modern." [Yates, F. A., *The Rosicrucian Enlightenment*, Routledge, London/New York, 2003, p. 159]
30. For an overview of them see Price, B., 'Introduction' in Price, B. ed., *Francis Bacon's New Atlantis*, Manchester University Press, Manchester, 2002, pp.18-19.
31. WFB III, 149
32. Jalobeanu, D., 'Bacon's Brotherhood and its classical sources', in Zittel, C., Engel, G., Nanno, R., Karafyllis, N. C. eds., *Philosophies of Technologies. Francis Bacon and his Contemporaries*, in *Intersections* 11, 1 (2008), Brill, p. 200.
33. WFB III, 136.
34. WFB III, 144.
35. WFB III, 131.
36. WFB III, 134.
37. Weinberger, J. speculates on the immoral desires of the sailors; see Weinberger, J., 'Science and Rule in Bacon's Utopia: An Introduction to the Reading of the *New Atlantis*', in *The American Political Science Review* 70, 3 (1976) pp. 865-885.
38. WFB III, 165.
39. See Prior, M. E., 'Bacon's Man of Science', in *Journal of the History of Ideas* 15, 3 (1954).
40. Spitz, D., 'Bacon's *New Atlantis*: A Reinterpretation', *Midwest Journal of Political Science* 4, 1 (1960), pp. 52-61.
41. Adams, R. P., 'The Social Responsibilities of Science in *Utopia*, *New Atlantis* and after', *Journal of the History of Ideas*, vol. 10, 3 (1949), pp. 392-394.
42. See Prior, M. E., 'Bacon's Man of Science', in *Journal of the History of Ideas* 15, 3 (1954), pp. 369-370.
43. See also McMullin, E., 'Openness and Secrecy in Science: Some Notes on Early History', in *Science, Technology & Human Values* 10, 2 (1985), p. 14: "It has long been taken for granted that science ought to be an open enterprise, that it is of its nature public, and that knowledge is most effectively pursued when disseminated without hindrance."
44. See also Shapin, S. and Schaffer, S., *Leviathan and the Air-Pump*, Princeton University Press, Princeton, 1985, p. 343: "We regard our scientific knowledge as open and accessible in principle, but the public does not understand it. Scientific journals are in our public libraries, but they are written in a language alien to the citizenry. We say that our laboratories constitute some of our most open professional spaces, yet the public does not enter them. […] A form of knowledge that is the most open in principle has become the most closed in practice."
45. The Greek word "*esōterikos*" comes from "*esō*" ("within") < "*es*", "*eis*" ("into") [*Oxford English Dictionary*].

46. See also Eamon, W., *Science and the Secrets of Nature*, Princeton University Press, Princeton, 1994, p. 357: "In the modern setting, the social function of esotericism has been increasingly performed by the construction of disciplinary boundaries. […] Institutionalization may have replaced esotericism in science, but sociologically its goals are the same: it is a mechanism for protecting the discipline from external criticism and from pollution by outsiders. The modern scientific community, governed by the principle of peer review, has become essentially closed to input from the outside, even when its research is perceived by outsiders as threatening."
47. *The Advancement of Learning*, WFB III, 474.

Bibliography

1. Adams, R. P., 'The Social Responsibilities of Science in *Utopia*, *New Atlantis* and after', in *Journal of the History of Ideas*, 10, 3 (1949), pp. 374-398.
2. Bacon, F., *Noua Altantida*, trans. and introd. study by Jalobeanu, D., ed. by Jalobeanu, D., Nemira, Bucure□ti, 2007.
3. Bacon, F., *The Works of Francis Bacon,* ed. by Spedding, J., Ellis, R.L., Heath, D.D., *The Works of Francis Bacon: Baron of Verulam, Viscount St. Alban, and Lord High Chancellor of England*, 14 vols., 1870, Garrett Press, New York, 1968 [reprint].
4. Cohen, I. B., *Revolution in Science*, Harvard University Press, Cambridge/MA, 1985.
5. Descartes, R., *Oeuvres de Descartes*, ed. by Adam, C. & Tannery, P., 11 vols., Vrin, Paris, ³1996.
6. Eamon, W., *Science and the Secrets of Nature. Books of Secrets in Medieval and Early Modern Culture*, Princeton University Press, Princeton, 1994.
7. Eamon, W., 'The Accademia Segreta of Girolamo Ruscelli: A Sixteenth-Century Italian Scientific Society', in *Isis* 75, 2 (1984), pp. 372-342.
8. Gaukroger, S., *Francis Bacon and the Transformation of Early-Modern Philosophy*, Cambridge University Press, Cambridge, 2001.
9. Gilbert, W., *De magnete*, trans. by Mottelay, P. F., Dover Publications, New York, 1958.
10. Harrison, P., 'Curiosity, Forbidden Knowledge, and the Reformation of Natural Philosophy in Early Modern England', in *Isis* 92, 2 (2001), pp. 265-290.
11. Harrison, P., 'Original Sin and the Problem of Knowledge in Early Modern Europe', in *Journal of the History of Ideas* 63, 2 (2002), pp. 239-259.
12. Jalobeanu, D., 'Bacon's Brotherhood and its classical sources', in Zittel, C., Engel, G., Nanno, R., Karafyllis, N. C. eds., *Philosophies of Technologies. Francis Bacon and his Contemporaries*, in *Intersections* 11, 1 (2008), Brill, pp. 197-230.
13. Jalobeanu, D., 'The fascination of Solomon's House in seventeenth century England', in Alexandrescu, V. ed., *Branching off: The Early Moderns in quest of the unity of knowledge,* Zeta Books, Bucharest, 2009.
14. Kuhn, T. S., *The Essential Tension*. *Selected Studies in Scientific Tradition and Change*, University of Chicago Press, Chicago, 1977.
15. Mersenne, M., *La vérité des sciences*, chez Toussainct du Bray, Paris, 1625 [reprinted: Frommann-Holzboog, Stuttgart/Bad-Cannstatt, 1969].
16. McMullin, E., 'Openness and Secrecy in Science: Some Notes on Early History', in *Science, Technology & Human Values* 10, 2 (1985), pp. 14-23.
17. Price, B. ed., *New Atlantis. Interdisciplinary Essays*, Manchester University Press, Manchester/New York, 2002.
18. Prior, M. E., 'Bacon's Man of Science', in *Journal of the History of Ideas* 15, 3 (1954), pp. 348-370.
19. Rossi, P., *The Birth of Modern Science*, trans. by Ipsen, C. N. and Ibsen, C., Blackwell, Oxford, 2001.

20. Sargent, R.-M., 'Bacon as an advocate for cooperative scientific research' in Peltonen M. ed., *The Cambridge Companion to Bacon*, Cambridge University Press, Cambridge, 1996.
21. Shapin, S. and Schaffer, S., *Leviathan and the Air-Pump*, Princeton University Press, Princeton, 1985.
22. Simmel, G., 'The Sociology of Secrecy and of Secret Societies', trans. by Small, A. W., in *The American Journal of Sociology* 11, 4 (1906), pp. 441-498 [Simmel, G., 'Das Geheimnis und die geheime Gesellschaft', in *Gesamtausgabe* vol. 11, chap. 5, Suhrkamp, Frankfurt/M, 1992].
23. Spitz, D., 'Bacon's *New Atlantis:* A Reinterpretation', in *Midwest Journal of Political Science,* 4 (1960), pp. 52-61.
24. Weinberger, J., 'Science and Rule in Bacon's Utopia: An Introduction to the Reading of the *New Atlantis*', in *The American Political Science Review*, 70, 3 (1976), pp. 865-885.
25. Yates, F. A., *The Rosicrucian Enlightenment*, Routledge, London/New York, 2003.