

On the Origin of the Royal Society of London

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런던王立學會의 起源에 관하여

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요 약

런던王立學會가 형성되어간 과정과 또한 이學會의 창립의 철학적 견지에 대해서는 여러 가지의 상반되고 혼동을 가져오는 증거들이 발견된다. 이미 17세기에 이 학회의 기원에 대한 다른 의견들이 있었으며, 이 현상은 금일에 이르기까지 계속하여 존속하고 있다. 두 개의 相爭하는 說이 있다. 옥스포드假說에 의하면, 1648년에 시작하였고 1650년대에 계속되었던 옥스포드에서의 一連의 미팅들을 통하여 학회의 기원이 이루어졌다는 것이고, 런던가설은 王立學會의 선구자가 1645년이나 혹은 그 조금전에 런던에서 실험과학을 장려하기 위하여 모인 지식인들의 비공식모임체였다고 한다. 두 說은 학회의 철학적 성격에 대하여도 그들에 결부된 틀린 주장을 제시하고 있다. Thomas Sprat(1635—1713)에 의해서 1667년에 제시된 옥스포드기원설은 11년후에 John Wallis(1616—1703)에 의해서 수정된다. 그에 의하면 Sprat이 말한 Oxford미팅들은 1645년경에 런던에서의 다른 모임들에 의하여 先行되었으며, 이 주장은 후세의 역사가들에 의해서 일반적으로 받아들여져 왔던 것이다.

그런데 1967년에 학회의 기원과 철학에 관한 일대파문을 일으킨 주장이 Magery Purver에 의해서 제시되었다. Purver에 의하면, Sprat이 런던그룹을 학회의 선구자로서 인정하기를 거론한 것은 단순한 무시이거나 편견이 아니라는 것이다. 두 그룹은 개념적으로 또 질적으로 달랐는데 옥스포드그룹만이 진정한 베이컨주의자들의 모임이었다는 것이다. 학회의 진정한 철학적 기반은 베이컨주의뿐이다. 결국 Purver의 주장은 17세기 과학혁명의 완성에 있어서 Bacon主義의 절대적 영향력이 강조된 대표적인 예이다. 그러나 이 인식은 과연 타당한 것인가?

비록 과학촉구의 방법에 대한 베이컨의 진술이 많은 과학자들을 인도한 것은 사실이나, 이는 과학혁명의 쏠시기를 통하여 이룩된 업적에 대한 부분적인 설명이상을 제공하지는 못한다. 청교도혁명의 기간(1649—1660) 동안에는 옥스포드 그룹 외에도 상호연관이 되어 있는 많은 비공식단체들이 증식하고 있었다. 그러한 많은 미팅들은 실험과학의 珍新性(novelty)에 자극되었으며 또한 실험과학의 발전을 위한 이상적 매개체였다. 최근에는 베이컨의 “새로운 과학”의 체계가 실려있는 그의 저서들의 권위에 대한 의문이 학자들에 의하여 제기되고 있다. 어쩌면 학회의 창설자들은 理想的인 과학자로서 베이컨보다는 하비, 갈릴레오, 데카르트, 가상더 등이 더 인상적이었을지 모르겠다. 런던그룹의 대부분의 멤버가 후에 옥스포드그룹의 멤버가 되었으며, 왕정복고후에 아직도 살아

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있던 런던그룹의 멤버는 모두 王立學會의 회원이 되었다는 사실은 런던그룹이 진정한 Baconian이 아니었다는 논의에 반박이 되고 있다. 런던그룹, 옥스포드그룹 그리고 베이컨 哲學의 三者이외에도 학회의 탄생에 관련있는 여러 요소와 사상(idea)이 존재한다. 그들중의 몇몇을 이름들어 보면, Gresham College說, 外國人들의 기여, 소위 말하여지는 "Invisible College" 그리고 Merton의 淸교도命題 등이 있다. 단 하나의 그룹이 단 하나의 과학철학을 가지고 런던王立學회의 선구자가 되었다는 의견은 틀린 것 같다. 왕립학회의 기원을 구성한 요소로서는 다른 장소와 시간속에서 다른 철학적 견지를 가지고 만난 많은 그룹들이 존재하였다.

The Royal Society was established in 1660 at Gresham College in London, which is generally referred to as a significant landmark in intellectual history. Being the oldest scientific organization in Great Britain and one of the oldest in Europe, the Royal Society was first incorporated in 1662 as the Royal Society of London for improving physical sciences in particular.¹⁾ In this paper I will chiefly be concerned with the process by which the Society was formed and its philosophical discipline. However, they are not easy issues to approach at all. Concerning the origin of the Royal Society of London we find different, confusing and inconsistent evidences for its answer. As we shall see soon, even in the seventeenth century there were different opinions on the origin of the Society and they continued to persist in that way till modern days. Charles Webster recognized well this problem when he asserted that no sufficient attention had been given to the difficult problem of the Society's origin and intellectual outlook during its crucial formative period.²⁾ Thus he states:

Assessing the relationship between the Royal Society and its precursors has thus become a complex historical problem, the solution of which requires a sensitive understanding of the many factors involved and a recognition that no single explanation is totally sufficient and exclusive.³⁾

This view will represent the basic line of my argument in discussing the emergence and the nature of the Society.

Roughly there are two major contending theories concerning the origin issue: The London hypothesis is that the precursor of the Royal Society was an informal body of learned men who met together in London in or slightly before 1645 to encourage experimental science. The Oxford hypothesis, on the other hand, claims that the Society was originated through the series of meetings in Oxford which started in 1648 and continued during the 1650s. Now let us examine these theories and their proponents in more detail.

The oldest account of the emergence of the Royal Society of London is going to be found in Thomas Sprat's (1635—1713) *History of the Royal Society* (London, 1667). Sprat, the first historian of the Royal Society, then a Fellow of Wadham College, Oxford, afterwards Bishop of Rochester, clearly announced that the Oxford meetings of the 1650s became the precursor of the Society. Sprat narrated the following:

1) *The New Columbia Encyclopaedia* (New York: Columbia University Press, 1975), p. 2368.

2) Charles Webster, "The Origins of the Royal Society," *History of Science*, 6 (1967), 106.

3) *Ibid.*, p. 107.

It was there, some space after the end of the Civil Wars at Oxford, in Dr. Wilkins his Lodgings, in Wadham College, which was then the place of Resort for Vertuous, and Learned Men, that the first meetings were made, which laid the foundation of all this that follow'd. The University had, at that time, many Members of its own, who had begun a free way of reasoning; and was also frequented by some Gentlemen, of Philosophical Minds, whom the misfortunes of the Kingdom, and the security and ease of a retirement amongst Gown-men, had drawn thither.

Their first purpose was no more, than onely the satisfaction of breathing a freer air, and of conversing in quiet one with another, without being engag'd in the passions, and madness of that dismal Age....⁴⁾

The principal, and most constant of them, were Doctor Seth Ward, the present Lord Bishop of Exeter, Nr. Boyle, Dr. Wilkins, Sir William Petty, Mr. Mathew Wren, Dr. Willis, Dr. Bathurst, Dr. Christopher Wren, Mr. Rook: besides several others, who joyn'd themselves to them, upon occasions.⁵⁾

Sprat himself was a disciple and protégé of John Wilkins(1614—72), prominent mathematician and the Warden of Wadham College.

Eleven years after Sprat's explanation had been given we encounter a totally different account of the origin issue. In 1678 John Wallis⁶⁾(1616—1703) offered a correction of Sprat's narration with his assertion that there Oxford meetings had been preceded by others at Gresham College beginning about 1645. What Wallis stated is that about 1645 he, Wilkins, several physicians, and others met weekly either in Gresham College or in a neighboring town to talk on natural science, or experimental philosophy. Wallis is quoted hereby:

I take its first Ground and Foundation to have been in London, about the year 1645. (if not sooner) when the same Dr. Wilkins (then Chaplain to the Prince Elector Palatine, in London), Dr. Jonathan Goddard, Dr. Ent, (now Sir George Ent) Dr. Glisson, Dr. Scarbrough, (now Sir Charles Scarbrough) Dr. Merrit, with myself and some others, met weekly, (sometimes at Dr. Goddards Lodgings, sometimes at the Mitre in Wood-street hard by) at a certain day and hour, under a certain Penalty, and a weekly Contribution for the Charge of Experiments, with certain Rules agreed upon amongst us. Where (to avoid diversion to other discourses, and for some other reasons) we barred all Discourses of Divinity, of State-Affairs, and of News, (other then what concern'd our business of Philosophy) confining our selves to Philosophical Inquiries, and such as related thereunto; as Physick, Anatomy, Geometry, Astronomy, Navigation, Staticks, Mechanicks, and Natural Experiments. We there discoursed the Circulation of the Blood, the Valves in the Veins, the Copernican Hypothesis, the Nature of Comets and new Stars, the Attendants on Jupiter, the Oval shape of Saturn, the Inequalities and Selenography of the Moon, the several Phases of Venus and Mercury, the Improvement of Telescope, and grinding of Glasses for that purpose,.....the weight of the Air, the Possibility or Impossibility of Vacuities, and Natures abhorrence thereof, the Torricellian Experiment in Quicksilver, the Descent of Heavy Bodies, and the Degrees of Acceleration therein; with others of like nature. Some of which were then but new Discoveries, and others not so generally known and embraced as now they are.

These Meetings we removed, soon after, to the Bull-head in Cheapside; and (in Term-time) to

4) Thomas Sprat, *History of the Royal Society*(London, 1667) ; ed. with critical apparatus by Jackson T. Cole and Harold Whitmore Jones(St. Louis, Mo.: Washington University Press, 1958), p.53. Subsequent citations are to this later edition.

5) *Ibid.*, p.55.

6) John Wallis(1616—1703) was Savilian professor of geometry in Oxford from 1649 until his death.

Gresham College, where we met weekly at Mr. Foster's Lecture, (then Astronomy-Professor there) and, after the Lecture ended: repaired, sometimes to Mr. Foster's Lodgings, sometimes to some other place not far distant, where we continued such Inquiries; and our numbers encreased.

About the years 1648, 1649, some of our Company were removed to Oxford; (first Dr. Wilkins, then I, and soon after, Dr. Goddard;) whereupon our Company divided. Those at London, (and we, then we had occasion to be there) met as before. Those of us at Oxford, with Dr. Ward, (now Bishop of Salisbury) Dr. Petty, (now Sir William Petty) Dr. Bathurst, Dr. Willis, and many others of the most inquisitive Persons in Oxford, met weekly (for some years) at Dr. Petty's Lodgings on the like account; (to wit, so long as Dr. Petty continued in Oxford, and for some while after; because of the conveniences we had there, (being the House of an Apothecary) to view, and make use, of Drugs and other like matters, as there was occasion. (John Wallis, *A Defence of the Royal Society, and the Philosophical Transactions, Particularly Those of July 1670, in Answer to the Cavils of Dr. William Holder*. London, 1678.)⁷⁾

Actually this is the first of two versions of Wallis's account made by Wallis himself: The first one quoted above is made in 1678 in a pamphlet which formed a part of a controversy against William Holder;⁸⁾ The second statement of Wallis made in an autobiographical letter to a friend on January, 1696 modified the first account in detail but identical in substance.⁹⁾ The quotation of his first statement will provide us with essential evidences for our later arguments concerning the relation between the London and Oxford groups. We see through Wallis's statement that some members of the London group later moved to Oxford and began the Oxford meetings, while the London group kept on meeting there. According to Douglas McKie, the differences between Wallis's two versions are due to his careful re-editing of detail.¹⁰⁾ In his second statement Wallis omitted the name of Scarbrough and added that of Haak, "a German of the Palatinate, and then Resident in London,"¹¹⁾ which makes the major difference between his two accounts.

Historians in general accepted Wallis's account of the original meetings in London which led to the foundation of the Royal Society in 1660, thus Thomas Birch after 100 years faithfully repeated the content of Wallis's statement in the first pages of his *History of the Royal Society* of 1756.¹²⁾ It seems to be that historians believed that Wallis did not contradict Sprat's account but complemented him. As we see from both of Wallis's and Sprat's quotations, Wallis had been a member both of the London and of the Oxford groups.

7) Reproduced in Douglas McKie, "The Origins and Foundation of the Royal Society of London," *Notes and Records of the Royal Society of London* 15(1960), 11-13.

8) *Ibid.*, p. 11.

9) In *Ibid.*, p. 14 McKie informs that the original form of the second version is printed in vol. i, pp. clxi-clxiv, of *Peter Langford's Chronicle*, ed. Thomas Hearne, 2 vols. (Oxford, 1725). The original is in the Bodleian Library; see for its copy, D.H.D. Roller and R.E. Schofield, eds., *Readings in the History of Science: The Sixteenth & Seventeenth Centuries* (Unpublished MSS., History of Science Collection, University of Oklahoma, 1964), pp. 174-175; Wallis's second statement is also found in his autobiography in C.J. Scriba, "The Autobiography of John Wallis, F.R.S., *Notes and Records of the Royal Society of London*, 25(1970), 39-40.

10) McKie, p. 15.

11) *Ibid.* Haak will be discussed later again on his possible connection with the "Invisible College."

12) Thomas Birch, *The History of the Royal Society of London for Improving of Natural Knowledge, from its First Rise*, Vol. 1 (London, 1756), pp. 1-3.

In 1698/9 Robert Hooke incidentally made a statement which confirmed Wallis's view when he wrote that "tis well known who were the principal Men that began and promoted that Design (the origins of the Royal Society), both in this City [London], and in Oxford."¹³⁾

Margery Purver published a controversial book in 1967 which dealt with the origin and the philosophy of the Royal Society of London with the title, *The Royal Society: Concept and Creation*.¹⁴⁾ Hugh Trevor-Roper, in his "Forward" to the work, offers an excellent summary of Purver's assertion which may be summarized as follows: After Purver examined the statements of both Sprat and Wallis and the circumstances in which each was made, she came to the conclusion that Sprat's authority should be preferred to that of Wallis, claiming that Sprat's refusal to recognize the London group of the 1640s as a direct ancestor of the Royal Society could not be dismissed as mere ignorance or prejudice. Purver argues that the two groups were conceptually and qualitatively different. The earlier group was concerned with particular discoveries, while the latter were involved with conceptual change. The former was vulgar Baconian, according to Purver, and the latter real Baconian.¹⁵⁾ Purver claims that the main thesis of her work is to show that

the effective scientific revolution of the seventeenth century owed a considerable debt to an intellectual revolution of a far more conscious kind than has hitherto been indicated, whose practical application was the deliberate inauguration of a new system of sciences.¹⁶⁾

Thus the crystallization of the intellectual revolution was, for Purver, the formation of the Royal Society in 1660, which adopted the real Baconianism as its philosophical foundation, a new system of sciences. Purver believes that Francis Bacon's role for the advancement of science was unduly underestimated and gives high praise to him when she states:

In fact, Bacon's contribution was not scientific but philosophical in nature. Yet so profound was his concept in its perception, scope and foresight, that in action, its effect was dynamic, as he predicted. His concept embraced the entire range of nature in its working, both in its uninhibited manifestations and under controlled conditions created by the experimenter. The structure of 'the New philosophy' was to be a comprehensive and expanding system of related inductive sciences, and to this vast theme Bacon brought a powerful imagination.¹⁷⁾

Purver's assertion is that, while it is generally accepted that the activities of the Royal Society were essential for the rise of the natural sciences, historians usually forget that it was the

13) Quoted by A.R. Hall and M.B. Hall, "The Intellectual Origin of the Royal Society—London and Oxford," *Notes and Records of the Royal Society of London*, 23(1968), 158; originally from W. Derham ed., *Philosophical Experiments and Observations*(London, 1726), pp. 388—389 and facsimile reprint(London: Frank Cass, 1967). For other confirmations, see R.H. Syfret, "The Origins of the Royal Society," *Notes and Records of the Royal Society of London*, 5(1948), : 81, 83.

14) Margery Purver, *The Royal Society: Concept and Creation*, with an Introduction by H.R. Trevor-Roper(London: Routledge & Kegan Paul, 1967).

15) Hugh Trevor-Roper, "Forward," in Purver, *The Royal Society*, pp.xiv—xvii.

16) Purver, p. 3.

17) *Ibid.*, p. 236.

result of "a conscious and deliberately-conceived ideal."¹⁸⁾ She blames modern scholars for their belief that "this undertaking was the unpremeditated, inevitable product of its age."¹⁹⁾

Charles Webster challenges Purver's thesis as a whole.²⁰⁾ Webster, pointing out the general misconception of historians that the Royal Society's philosophy was that of Francis Bacon, challenges the validity of Sprat's book which described Baconianism as only one legitimate philosophy of the Society and the Oxford meeting was the first precursor of the Royal Society. When Purver argued that the Oxford group was the only true precursor of the Royal Society,²¹⁾ Webster believes she did so because Purver believed Sprat's description was totally reliable, therefore her book naturally repeated what Sprat argued; namely, the outline of the history of the natural philosophy of Francis Bacon.²²⁾ Purver oversimplified Bacon's natural philosophy, the ideology and history of the Royal Society, because, Webster continues, she is obviously unfamiliar with the literature of Bacon and the Royal Society.²³⁾

As Webster correctly mentions, "even at the Society's inception there was evidence of hostility from the universities, medical profession and section of the church."²⁴⁾ Under this situation Sprat's book was aimed at to be an apologetics toward detractors, therefore, the *History* of Sprat is hard to be regarded as "a calm, impartial survey of their natural philosophy."²⁵⁾ "Therefore the Baconianism," continues Webster, "which is so evident in the *History* [of sprat], is partly an expression of Sprat's philosophy, partly an indication of the philosophical alignment of the early Royal Society, but also the most effective means of undermining current criticisms."²⁶⁾ Against Purver's claim that "Sprat's exposition of the role of the new society is the only comprehensive contemporary account,"²⁷⁾ Webster argues that

Sprat's personality, his lack of familiarity with the current scientific developments and the apologetic bias of his work, prevent our accepting Miss Purver's opinion that he is the only reliable source for our judgements about the early Royal Society.²⁸⁾

Webster also asserts that Bacon's system is too fragmentary, unsystematic and ambiguous to be the only one legitimate natural philosophy of the Society. Although it is true that many scientists guided by Bacon's statements on scientific method, as Webster argues, it is only a partial explanation for the whole scientific achievement of this time.²⁹⁾ The Oxford group is only "an indirect precursor of the Royal Society, along with the interrelated complex of informal scientific societies which proliferated during the Puritan revolution," and "these meetings were

18) *Ibid.*, p. 239.

19) *Ibid.*

20) Charles Webster, "The Origins of the Royal Society," *History of Science*, 6(1967), 106-128.

21) Purver, p. 127.

22) Webster, p. 108.

23) *Ibid.*, pp. 109-110.

24) *Ibid.*, p. 114.

25) *Ibid.*

26) *Ibid.*

27) Purver, p. 94.

28) *op. cit.*, p. 115.

29) *Ibid.*, pp. 116-117.

30) *Ibid.*, p. 124.

stimulated by the novelty of experimental science and proved an ideal medium for its advancement."³⁰⁾ For Webster, the influence of Descartes, Galileo and Gassendi with their philosophies was as important as Bacon's for the rise of the experimental science in Restoration England.³¹⁾ Webster concludes as follows:

In philosophy Bacon was significant, but his pre-eminence lay as a visionary, providing the psychological motivation for the new philosophy.....no single pre-Restoration group was responsible for the Royal Society.³²⁾

And the belief "that the founders existed in discrete, ideologically uniform groups" is simply wrong because "the individual and the precursors of the Royal Society were the individuals who constituted its active nucleus."³³⁾

Recently, scholars began to raise serious doubt on the authority of Bacon's new system of sciences which was envisioned in his works. Douglas McKie directs our attention on the fact that scientific academies were developing on the Continent from the beginning of the seventeenth century and such societies existed in Italy and in France before the publication of the *New Atlantis* of Bacon, casting his serious doubt on the general understanding that Bacon's idea of a scientific experimental academy was a factor in the foundation of the Royal Society of London.³⁴⁾ Then McKie, turning to another work on the new scientific method, *Novum Organum*, presents a severe criticism of Bacon's inductive method as follows:

This new method involved the collection of as large a mass of facts as possible relevant to the problem to be investigated; the facts were then to be classified into three tables.....A study of these tables of data would, Bacon considered, reveal the nature or essence or cause of the phenomenon that was being investigated. However, it can safely be said that no man ever discovered or could discover anything by this method. It was all logic without imagination, and it comes near to being described as research by administration and the filling up of forms.³⁵⁾

Geoffrey Keynes wants to replace Bacon for Harvey as the champion who influenced most on the originators of the Royal Society of London.³⁶⁾ His argument starts with explaining the reason why Bacon's name became so famous. Sprat, in his *History of the Royal Society* (London, 1667), praised highly Bacon as the champion of anti-Aristotelianism,³⁷⁾ and this is the very reason, for Keynes, why Bacon was to be regarded as the Great Originator and advocator of experiment, though Keynes admits Bacon was the first statesman of science.³⁸⁾ For Keynes, Bacon is not a true advocator of experiment. Thus after branding Bacon's *Novun Organum*,

31) *Ibid.*

32) *Ibid.*, p. 125.

33) Webster, pp. 125—126.

34) Douglas McKie, "The Origins and Foundation of the Royal Society of London," *Notes and Records of the Royal Society of London*, 15 (1960), 9.

35) *Ibid.*

36) Geoffrey Keynes, "Bacon, Harvey and the Originators of the Royal Society of London," *Proceedings of the Royal Society of London*, B, 169 (1967), 1—16.

37) Sprat, *History of the Royal Society*, pp. 35—36.

38) *op. cit.*, p. 1.

which meant to replace Aristotle's *Organon*, as "too all-embracing and too nebulous,"³⁹⁾ Keynes directs his attack on Bacon's *Sylva Sylvarum* of 1627, discussing Bacon's contribution to forward experimental science, which read as follow:

A modern reader's chief complaint will be that seldom does Bacon suggest the performance of a fruitful experiment. The book is not, as might have been expected, a compendium of scientific method. The great statesman of science was sitting in his armchair reading books and building pseudo-scientific castles in the air. His material is all gathered from the books of others.....It is an irony of fate that one of the few experiments he is known to have done with his own hands, the refrigeration of the carcass of a hen with snow, resulted in his death from acute bronchitis.⁴⁰⁾

Furthermore Bacon tried to ignore contemporary scientific accomplishments to extoll himself and he showed his actual ignorance of them when

Bacon continually criticized the miserable, the pitiful state of science before and in his time in order to give more point to his own boastful extolling of new ways of investigation invented by himself. So it is not surprising that he should ignore the achievements of so many of his predecessors and contemporaries. Agricola's advances in mineralogy are not mentioned, nor those of Paracelsus in medicine. Giordano Bruno's work on the rotation of the earth, Galileo's and Kepler's on astronomy, Ubaldi's, Stevin's and Harriot's on physics and mathematics are ignored. At a time when no astronomer denied the rotation of the earth or its motion round the sun, Bacon disputed it. Gilbert's work on electricity and magnetism was mentioned, only to be dismissed as fables. Copernicus was declared wrong.⁴¹⁾

Bacon might have been an expert in propaganda of science with his rhetoric, eminent social status and political power, however this does not entitle him to the first place in stimulating the originators of the Royal Society. For Keynes the small number of individuals who constituted the originators of the Society must have been influenced more by *Galileo, Gilbert, and Harvey, etc.* than by Bacon as the ideal scientists.⁴²⁾

The point of Keynes' argument was that most of the members who met in London in 1645 and later in Oxford possessed strong medical backgrounds. The consequent implication of this was, for Keynes, the probable importance of William Harvey as an influence on these original members of the Society. As we have seen on p. 125, Wallis gave the following names: Dr. Jonathan Goddard, Dr. George Ent, Dr. Glisson, Dr. Scarburgh, Dr. Christopher Merrett, Dr. Wilkins, and Wallis himself. Against the traditional stress on their being mathematicians and physicists, Keynes states their strong characteristics of physicians to substantiate the claim that Harvey's influence may have been of paramount importance in the early stages of the formation of the Society. The summarization of their careers is as follows:⁴³⁾ Jonathan Goddard became a

39) *Ibid.*, p. 2.

40) Geoffrey, "Bacon, Harvey and the Originators of the Royal Society," *Proceedings of the Royal Society of London*, B, 169(1967), 3.

41) *Ibid.*, p. 4.

42) *Ibid.*, p. 5.

43) *Ibid.*, pp. 9—10.

candidate of the College of Physicians in 1643 and a Fellow in 1646, and knew Harvey personally; Ent, being an M.D., was Harvey's close friend and admirer; Glisson was a reputed anatomist on Harveian lines and knew Harvey well; Wallis also, though primarily reputed as a mathematician, was much interested in medicine; Scarburgh worked as Harvey's assistant at one time; Merrett worked in close association with Harvey and was nominated by Harvey as the first keeper of the Harveian Library at the College; Lastly John Wilkins knew Harvey closely. The members added later in the Oxford meeting, namely Dr. Seth Ward, Dr. Bathurst, Dr. Willis and Dr. Petty, were all also friends of Harvey or worked in close relation with Harvey.

The possible influence of Harvey on the original members seems to be supported well if we remember the subjects of discussion of the early meetings, which were explained by Wallis on p.125, were, in addition to mathematics and astronomy, the circulation of the blood, valves, which seems to be very Harveian subject.

Keynes counts that among forty-one names listed after the establishment of the Royal Society, no less than fifteen of them were physicians.⁴⁴⁾

Joseph Agassi thinks that science has two images: "a shop-window image which is radicalist and neat and devoid of all problems, and a workshop image where all is in constant mess."⁴⁵⁾ Agassi believes that Purver tried to show science has only a shop-window image in her volume when she declared the distinction between true Baconianism and vulgar Baconianism. Agassi was amazed at Purver's "taking Sprat's claims seriously and literally.....her uncritical acceptance of so much on his mere say-so."⁴⁶⁾ For Purver, Sprat's History of 1667 was the only one reliable source for the origin of the Society. Sprat, the mouthpiece of Willkins of Oxford, claimed that the Oxford group was the one which led to the foundation of the Royal Society in 1660 as I mentioned earlier.

However Agassi agrees with Purver on the issue of ideology: "the quarrel with the universities was the Baconian radicalist ideology which made the Royal Society declare through Sprat that the universities were worse than nothing."⁴⁷⁾ But he does not believe that the London group and Oxford group are different in their ideologies.

Christopher Hill argues that Wallis was not contradicting Sprat, raising a question whether Wallis could lie about matters known to many still alive in 1678 and could pass for three hundred years without being detected. Hill believes Wallis was only adding to Sprat's narrative, and points to the fact that one of Wallis's contemporaries said that he was wrong.⁴⁸⁾ Wallis's accounts had its own internal consistency, argues Hill; Wallis forgot to mention Haak in 1678, so he revised his former statement by saying that Haak was the man who suggested the first meetings.⁴⁹⁾ Against Purver's argument that the London group was not real Baconian to be

44) *Ibid.*, p.12.

45) Joseph Agassi, "The Origins of the Royal Society," *Organon* 7(Warsaw, 1970), 135.

46) *Ibid.*, pp.120—121.

47) *Ibid.*, p.124.

48) Christopher Hill, "The Intellectual Origins of the Royal Society—London or Oxford?" *Notes and Records of the Royal Society of London*, 23(1968), 147—148.

49) *Ibid.*, p.148.

regarded as the original occasion for the establishment of the Royal Society, Hill responds: "So many members of the London group were later members of the Oxford group," including Wallis and Wilkins, and "all those members of the London group who were alive after the Restoration became Fellows of the Royal Society."⁵⁰⁾

Again we should pay our attention to the political situations of 1663—1667 to see why Sprat's *History of the Royal Society* tried to conceal the London origin. The colleagues of the Society were concerned with propagating themselves, their object being to show that they were not harmful to the universities, to the church, nor to government. The tricky political circumstances of the early 1660's may have forced them not to make the *History* too factual.⁵¹⁾

Besides the London group, Oxford group and Baconian philosophy, there are many other factors and ideas which are responsible for the birth of the Society. They are, to name a few of them, the Gresham College hypothesis, the contribution of foreigners, the so-called "Invisible College," and the famous Merton's thesis of Puritan contribution to the seventeenth century English science.

Hill informs us that of the twelve founders of the Royal Society and of the *forty-one initial members* seven of them come from Gresham professors, their names being Baines, Croone, Goddard, Petty, Rooke, Whistler and Wren.⁵²⁾ As Wallis said in his first statement, Gresham College was the very home for the meetings of the London group. Webster declares that it was the focus of London scientific activity, "at which three prominent members of the Oxford Group obtained chairs: Rooke(1652), Wren(1657), Goddard(1657)."⁵³⁾ These Gresham meetings, Webster believes, provided the immediate basis for the Royal Society.⁵⁴⁾ F.R. Johnson also claims that Gresham College was the true precursor of the Royal Society.⁵⁵⁾ Westfall identifies it with Robert Boyle's "Invisible College."⁵⁶⁾

In 1641 a famous Czech philosopher and educator named Comenius visited England at the invitation of Samuel Hartlib, and he is said to have proposed to build "a pansophic institution to spread the light of wisdom throughout the human race and to benefit mankind."⁵⁷⁾ Though Keynes and other historians mentions the possibility that Comenius' proposal had some influence on the formation of the Society, so far it is not clear, according to Keynes, how much Comenius influenced on the origin of the Society.⁵⁸⁾ Theodore Haak, "a German Palatine, and then Resident in London," was the person who was mentioned by Wallis in his second statement concerning the origin of the Society as the one "who, I think, gave the first occasion, and first suggested those meetings."⁵⁹⁾ Theodore Haak(1605—90) learned the pansophic

50) *Ibid.*

51) *Ibid.*, p. 152.

52) Christopher Hill, "The Intellectual Origins of the Royal Society—London or Oxford?" *Notes and Records of the Royal Society of London*, 23(1968), 150.

53) Charles Webster, "The Origins of the Royal Society," *History of Science*, 6(1967), 123.

54) *Ibid.*

55) Francis R. Johnson, Gresham College. Precursor of the Royal Society," *Journal of the History of Ideas*, 1(1940), 413—38.

56) Richard S. Westfall, *The Construction of Modern Science: Mechanisms and Mechanics*(New York: John Wiley & Sons, 1971), p. 10.

57) Keynes, pp. 12—13.

58) *Ibid.* p. 13.

Commenian movement through Samuel Hartlib.⁶⁰⁾ Douglas McKie asserts that, though there is no historical evidence to connect the origin of the Royal Society with Comenius and pansophism, it is very likely that Haak was the first to suggest the meetings,⁶¹⁾ for which we should also count the statement of Wallis. According to Hill, Haak and Hartlib carried on extensive correspondence partly on behalf of the London group and they exactly anticipated the Royal Society through their correspondence on regular terms with Catholic scientists like Mersenne, the founder of the Paris group.⁶²⁾ Hartlib is another foreign resident of London, whose strong influence on Robert Boyle is well acknowledged by historians,⁶³⁾ the latter being one of the most active figures in the early history of the Society.

Robert Boyle(1627—1691) mentioned the “Invisible College” in his letter of 1645,⁶⁴⁾ in which Boyle himself connected the “Invisible College” “with that ubiquitous promoter for universal benevolence, Samuel Hartlib,” but Thomas Birch, the eighteenth century historian of the Royal Society, believed that this was Wallis’s Gresham College group.⁶⁵⁾ Ever since Boyle’s time numerous hypotheses have sprang up concerning the identity of “Invisible College.” However, one thing clear is that historians generally regarded it the beginning of the group of men who founded the Royal Society, identifying it with Theodore Haak’s group.⁶⁶⁾ R.H. Syfret first declared that it is the group of Samuel Hartlib(—1662) who tried to realize the Commenian vision of universal truth and the practical benefit of science which constituted the “Invisible College,” and that it was different from the Gresham and Oxford groups.⁶⁷⁾ Her argument was to be refuted by Turnbull to the effect that Hartlib could not have any direct influence upon the early groupings because he was himself not a scientist at all.⁶⁸⁾

Robert King Merton’s classic work, *Science, Technology and Society in the Seventeenth-Century England*, first published in 1938 in *Osiris*, has over the years since its initial publication triggered considerable debate on the role of various social, economical and religious factors in scientific progress.⁶⁹⁾ Perhaps Merton’s most controversial issue in his work seems to be his assertion that Protestant ethic played a very important role investigation. Far from there being a conflict between the rise of natural science and the new religion, Merton argued that the latter was a new cultural value which fathered the growth of science. Merton gave Puritanism ethos-causal role for the rise of the sciences in the seventeenth century, when he declared as

59) Douglas McKie, “The Origins and Foundation of the Royal Society of London,” *Notes and Records of the Royal Society of London*, 15(1960), 15.

60) Ibid.

61) McKie, p.15 ; Hill, p.149.

62) Hill, p.150.

63) For example, see Webster, pp.122—123.

64) Thomas Birch, “The Life on the Honourable Robert Boyle,” p.xxxv, in Thomas Birch, ed., *The Works of the Honourable Robert Boyle*, Vol.1(London, 1772).

65) M.B. Hall, “Sources for the History of the Royal Society in the Seventeenth Century,” *History of Science*, 5 (1966), 64.

66) Joseph Agassi’ “The Origins of the Royal Society,” *Organon* 7(Warsaw, 1970), 132.

67) R.H. Syfret, “The Origins of the Royal Society,” *Notes and Records of the Royal Society of London*, 5 (1948), 75—137.

68) G.H. Turnbull, “Samul Hartlib’s Influence on the Early History of the Royal Society,” *Notes and Records of the Royal Society of London*, 10 (1953), 101—130.

69) With new preface, New York: Harvard Fertig, Inc., 1970 ; paperback edition, New York: Harper & Row, 1970.

follows: "The Protestant ethic had pervaded the realm of science and had left its indelible stamp upon the attitude of scientists toward their work."⁷⁰⁾

the frequent recourse of scientists to religious vindication suggests first of all that religion was a sufficiently powerful social force to be invoked in support of an activity which was intrinsically less acceptable at the time.⁷¹⁾

Puritanism altered social orientations. It, by reshaping the social structure, brought esteem to science and directed some talents into scientific fields which otherwise would have devoted to other callings.⁷²⁾

The key to Merton's hypothesis of Puritan role on science is to find out how many Puritan scientists existed at this time under study. This is the decisive factor in evaluating Merton's thesis. Merton declared that, as the crucial experiment to prove his hypothesis, the majority of the prominent scientists in the early Royal Society were Puritans. Ever since its appearance, Merton's Puritan thesis gained considerable popularity among historians of science.

Gresham College, a merchantile institution where practical rather than speculative knowledge was favored, was the natural place to accomodate Puritan scientists and gentlemen who believed in the utilitarian value of science based on the philosophy of Bacon.⁷³⁾ As we have seen, the London group of 1640s has inseparable connection with Gresham College. Charles Webster contemplates that Sprat may have worried that a full exposition of the Society's early situation might reveal its Puritan association of the founders, so he did not mention the London group at all.⁷⁴⁾ Thus we hear a very plausible and fascinating reason why Thomas Hobbes(1588—1679), the modern Democritus, could not become a member of the Royal Society. As Merton argued, the Society had a predominantly Puritan membership, therefore Puritan orthodoxy was an important factor to the Fellows as well as for the motivation of their scientific work. It might have been a natural consequence of the phenomenon that Hobbes, an atheist and a mechanical materialist, was rejected by the Society.⁷⁵⁾ Stating that the nuclear group of the five in the Society, Wilkins, Wallis, Goddard, Boyle and Petty, were genuinely Puritan Fellows,⁷⁶⁾ Quentin Skinner offers his support to Merton's claim that "religious forces seem to have had a singularly strong influence in the founding of the Society."⁷⁷⁾

The idea that a single group with a single philosophy of science became the precursor of the Royal Society of London seems to be wrong. It comes from the erroneous oversimplification of historical process. There were different groups met at different times and places with different philosophical outlooks of physical nature which constituted the origin of the Royal Society of London.

70) Robert King Merton, *Science, Technology and Society in the Seventeenth-Century England*(New York: Harper & Row, 1970), p.84.

71) *Ibid.*, p.91.

72) *Ibid.*, p.94.

73) Hugh Trevor-Roper, p.xi in Purver, *The Royal Society: Concept and Creation*.

74) Charles Webster, "The Origins of the Royal Society," *History of Science* 6, (1967), 119.

75) Quentin Skinner, "Thomas Hobbes(1588—1679) and the Nature of the Early Royal Society," *Historical Journal*, 12 (1969), 224,

76) *Ibid.*, p.225.

77) Robert King Merton, *Science, Technology and Society in the Seventeenth-Century England*(New York: Harper & Row, 1970), pp.471—472.