



CHICAGO JOURNALS



History
of
Science
Society

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Source: *Isis*, Vol. 23, No. 2 (Sep., 1935), pp. 373-388

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Comenius and the Invisible College ⁽¹⁾

The work of the Royal Society in seventeenth century England is of such significance in the development of experimental science and in the recognition given this "new philosophy" that great importance is attached to any part of the life of that century which may help to explain the origins and growth of the Society. It has long been known that nearly a score of years before the Society obtained its charter, some science-lovers, or "virtuosi," were meeting informally first in London and then also in Oxford whither Parliamentary appointments had sent some of them. When the two groups came together again at the time of the Restoration, the Society was formally organized, receiving its charter from CHARLES II in 1662. The period of the first meetings of the Invisible College,—as that first group was called,—has been much discussed in regard to the scientific interests of the group as a whole and as individuals. But what the influences were that affected scientific work in the decade before these meetings began in 1645, and just why these particular virtuosi came together at that time are subjects less well understood. Various investigations, however, are now being made that may throw some light on these matters.

Recently a writer has placed great importance upon the visit of COMENIUS to England in 1641-2 as one of the hitherto less well-known influences leading to the formation of the Royal Society. The title of the book is worth quoting in full: *Comenius in England, the visit of Jan Amos Komensky (Comenius) the Czech Philosopher and Educationist to London in 1641-1642, its bearing on the Origins of the Royal Society, on the Development of the Encyclopaedia, and on plans for the Higher Education of New England and Virginia as described in contemporary documents,*

(1) Much of the material for this article was gathered while the writer was a fellow on the John Simon Guggenheim Memorial Foundation.

selected, translated and edited with an Introduction and Tables of Dates, by ROBERT FITZGIBBON YOUNG. In his introduction Dr. YOUNG writes: "The visit of COMENIUS to London in 1641-2 marks an important stage in the development in this country of the idea of a great institution for scientific research, which resulted in the organization of the 'Invisible Philosophical College' [*sic*] by THEODORE HAAK and others in 1645, and the foundation of the Royal Society in 1662." (2) These and similar statements led to a review of the evidence available about the genesis of the Society. As a result of this review, this study seeks to show that the Invisible College of 1645 was quite other than the great pansophic institution for which COMENIUS, backed by prominent statesmen and scholars, sought parliamentary support; that only one of COMENIUS's backers was a member of the Invisible College and that his most ardent supporter, HARTLIB, though a warm friend of many of the members then and later, was never himself a member; and that however much both COMENIUS and the Royal Society were influenced by BACON's *New Atlantis*, the Invisible College which was the Royal Society's "first beginnings" was no pansophic university carrying out the dreams of COMENIUS. Rather, it was merely a club of young men, some of the intelligentsia of that day, brought together by common college backgrounds and many common interests for rest and refreshment from the political, theological and military turmoil of the times. The close connections with similar groups on the continent have not hitherto been fully presented; but Dr. HARCOURT BROWN's book now in press presents correspondence between the virtuosi in England and those in France (3). In addition to probable European influences, the movement resulting in the formation of the Royal Society seems also more closely related to Puritanism than has hitherto been made clear; for that attack upon authority in the church and in the state had its effect upon authority in science also.

Only one of the ten documents in Dr. YOUNG's book on

(2) *Op. cit.*, pp. 6-7, Oxford Press 1932.

(3) *Scientific Organizations in Seventeenth Century France* (1620-1680), published in March, 1934 by WILLIAMS and WILKINS for the History of Science Society. Dr. BROWN kindly permitted the writer the use of his typescript in advance of its publication.

COMENIUS, the first and the most important, is new in English; for DAVID MASSON in his monumental life of MILTON (4) discusses most of the other documents in relation to MILTON's associations with SAMUEL HARTLIB, the sponsor of COMENIUS in England. The document newly translated is part of a treatise, *Continuatio admonitionis fraternae*, that COMENIUS wrote in 1669 to defend himself from attacks. The only known copy was found in 1913 in the Public Library at St. Petersburg. Dr. YOUNG believes it to have been based largely on COMENIUS's diaries, though it was written when COMENIUS was seventy-seven years old (5). In it COMENIUS gives an account of the development of his pansophic ideas. He tells also how in 1636 SAMUEL HARTLIB (1600-1662?), a wealthy German-speaking Pole living in London, hearing of his recent work along these lines through two young Czechs whom the Londoner had befriended, sent COMENIUS a generous subsidy and invited correspondence. The *Outline* of his *Compleat Wisdom* sent to HARTLIB came back to COMENIUS in printed form as *Praeludia Conatuum Pansophicorum Comenii*, having been printed at Oxford by HARTLIB because of the interest aroused in COMENIUS's theories. Finally HARTLIB urged COMENIUS so insistently to come to England to present his plans in person that COMENIUS arrived in September, 1641. He found that Parliament's attention had already been drawn to his ideas and those of JOHN DURIE in a sermon preached before it by Mr. GAUDEN, and that he had been invited by members of Parliament through HARTLIB. COMENIUS then quotes from that sermon the passage in which Mr. GAUDEN asks Parliament's favor "for the noble endeavours of two great and publique spirits, who have laboured much for truth and peace, ... COMENIUS [*sic*] and DURAEUS... The one hath laide a faire designe and foundation for the raising up a Structure of Truth, Human and Divine, of excellent use to all mankind, for the easiness and exquisiteness of attaining the true knowledge of things. The other hath long studied, and with greate pains endeavoured and wel advanced the peace and unity of the reformed churches."... (6) But the King was in Scotland, and only a

(4) MASSON : *Life of Milton*. (6 vols., London, 1881) vol. III, pp. 199-228.

(5) YOUNG, *Op. cit.*, p. 5.

(6) *Ibid.*, pp. 39-40.

handful of people were left to transact business. COMENIUS was invited to dine with the Bishop of Lincoln, who a few months later was to be appointed Archbishop of York. The bishop welcomed both DURIE and COMENIUS with HARTLIB and asked why COMENIUS had not brought his wife to England with him, at the same time offering him a yearly pension. COMENIUS reported that his wife was unwilling to come into exile with him, as she felt life in England would be. Unfortunately for COMENIUS the outbreak of war in Ireland upset Parliament's plans so that COMENIUS at length decided to accept an urgent invitation to visit Sweden. He therefore left England in June, 1642.

The men named by COMENIUS in this account as his "greater friends" or patrons in addition to HARTLIB and BISHOP WILLIAMS (1582-1650), were ROBERT GREVILLE, Lord BROOKE (1608-1643), JOHN SELDEN (1584-1654), JAMES USSHER (1581-1656), Archbishop of Armagh, JOHN PYM (1584-1643), and Sir CHENEY COLEPEPER (1603-1663), the latter a friend of BOYLE as the Bishop himself had been a friend of BACON (7). It is worth noting that most of these men were born in the 1580's in the middle of ELIZABETH's reign and that only one of them lived to see the Restoration. Other friends who welcomed COMENIUS when he first landed, as he states elsewhere (8), in addition to HARTLIB and DURY, were JOACHIM HÜBNER, from Cleves, a researcher for HARTLIB, JOHN PELL and THEODORE HAAK, all three young scholars with European experience.

Of all these men, old and young, only one, THEODORE HAAK (1605-1690), was named by his contemporaries as a member of the Invisible College. Dr. WALLIS, writing in 1696-7 (9) to supplement the account of this group which he had made in 1678 (10) credited HAAK with having suggested that the "College" meet in 1645. While JOHN PELL (1611-1685) was a skilled mathematician who later became a charter member of the Royal Society, he had scant opportunity in the late forties and early fifties to be with the virtuosi himself for he was much

(7) *Ibid.*, pp. 42, 44, 46.

(8) *Ibid.*, p. 64.

(9) "Dr. WALLIS's account of some passages of his own life, January 29, 1696-7," in T. HEARNE : *Works* (4 vols., London, 1810), vol. III, p. clxii.

(10) WALLIS : *Defence of the Royal Society* (London, 1678), pp. 7-8.

on the continent first as Professor of Mathematics in Amsterdam and at Breda and then as an envoy for CROMWELL to the Swiss cantons. With these exceptions of PELL, HAAK, HÜBNER and HARTLIB, the friends and patrons of COMENIUS were of an older generation and were most of them men of great prominence in the state by reason of their birth and their position. They were well chosen as the patrons for a great state-supported college with universal knowledge for its province; for their rank, their standing as men of learning and affairs and their prominence politically and socially would reflect glory upon the proposal and draw supporters to it.

Let us turn now to the Invisible College—to use BOYLE's name (11) for the little group of friends that was meeting weekly in London in 1645 to discuss the new philosophy. In the earliest (12) account of the College, Dr. WALLIS names seven members—WILKINS, GODDARD, ENT, SCARBROUGH, GLISSON, MERRIT, HAAK—besides himself and says there were some others also. One of these others almost certainly was BOYLE, for a few months later BOYLE writes proudly of the work "our" group was doing. Although in his first account WALLIS does not include SAMUEL FOSTER's name as a member, he does name him in 1696. Furthermore he remarks in his first statement that the group met in FOSTER's rooms at Gresham College until his death in 1652, and that they continued on there in the rooms of his successor LAWRENCE ROOKE. It is possible therefore to count FOSTER as a tenth member of the Invisible College. As professor of mathematics at Gresham College he logically belongs.

A study of these ten men (including BOYLE, FOSTER, and WALLIS) to ascertain their ages in 1645, their college backgrounds, their theological or political positions and the field of their business or professional interests brings to light certain interesting facts. The range in age of the group in 1645 is from 18 (BOYLE) to 48 (Dr. GLISSON) and five of them are from 28 to 31. In other words these men were definitely of the STUART times, born with two exceptions long after ELIZABETH had died. This is the

(11) BOYLE: *Works* (ed. Birch, 6 vols., London, 1772), vol. I, p. xxxiv.

(12) WALLIS: *Defence*, pp. 7-8. SPRAT's *History of the Royal Society* (London 1667) places the first meetings at Wadham College, Oxford, during the Commonwealth (p. 53).

first point of contrast between the Invisible College group and the much older men who had supported COMENIUS.

Of significance also are their common college backgrounds. BOYLE had gone abroad after three years at Eton. The other men were all university trained and had been in college with one or other of their number. WILKINS and GODDARD had each overlapped the other's term at Magdalen Hall, Oxford, in the early thirties. MERRIT and HAAK had done the same at the same time at Gloucester Hall, the other Puritan center in Oxford. ENT, WALLIS, GLISSON, SCARBROUGH and FOSTER were Cambridge men, WALLIS and FOSTER from Emmanuel, the Puritan foundation there, GLISSON and SCARBROUGH from Caius College (from which HARVEY had graduated some years before). Later SCARBROUGH went on to Merton at Oxford. ENT had followed Cambridge with Padua. It seems more than a mere coincidence that in this group of ten there should be two men from each of four colleges, and that three of the colleges should be the ones noted for their Puritan leanings and the fourth for its strongly medical trend.

Among the ten were two divines keenly interested in mathematics, a professor of mathematics, five doctors of medicine who also had other scientific interests, HAAK a translator, and BOYLE who was a "gentleman." SCARBROUGH was the Royalist of the group, the others having recognized Puritan tendencies and, some of them, Parliamentary appointment later. FOSTER, the professor of mathematics at Gresham College, because of his death in 1652 of course was not on the Royal Society list ten years later, but the others were all among its charter members.

Clearly, then, these were young professional men of the middle class, well educated and eager about the interests that had brought most of them to London in the early sixteen-forties. WILKINS was there as chaplain to the Prince Elector Palatine while he was in England. WALLIS, having served as secretary to the assembly of divines at Westminster the preceding year, had been awarded by Parliament a fellowship at Queens College, Cambridge, but in 1645 married and moved to London. Dr. GLISSON was already an authority on rickets and had a professorship at Cambridge, not moving to London from Colchester to live until 1648. THEODORE HAAK, a Calvinist refugee from the Palatinate, had come to England in 1625 when twenty years old, and after

several years at Oxford broken by a visit in Europe, had been employed by the Westminster Assembly to translate into English the Dutch annotations on the Bible. He was later given by Parliament the sole right of translation for fourteen years from the time of publication, together with a pension (13). It was HAAK who according to WALLIS first suggested the meetings of 1645 (14). And it was HAAK who had joined with HARTLIB in welcoming COMENIUS to England four years earlier.

Why then, if COMENIUS's visit resulted in the organization of the College, did WALLIS in 1678 in his defence of the Royal Society fail to mention HAAK's initiation of it and instead why did he emphasize the important part WILKINS played in the group, an importance borne out by the records of WILKINS' later activities at Oxford, Cambridge and in London from the very first meeting of the Royal Society? Do not informal club groups need the leadership of attractive personalities interested in their fellow-men as well as in their common intellectual pursuits? WILKINS from all accounts was preeminently such a tactful winning person, wherever he went forming the center of a group of eager minds and hailed by the younger men like HOOKE and CHRISTOPHER WREN as their great friend and patron (15). Furthermore, WILKINS had already published two books on scientific subjects (the first appearing in 1638). A third, *Mathematicall Magick*, he states (16) was written in the early forties, and it was probably available then in manuscript although it was not published until 1648. Of the group named as members of the Invisible College in 1645, the Prince Palatine's chaplain was probably the best known by virtue of his personality, his official standing and these publications.

As a matter of fact also, it is now being claimed that THEODORE HAAK was of far greater influence in these early days than has hitherto been recognized, despite WALLIS's having credited him with suggesting the first meetings of the Invisible College. In his

(13) *Dictionary of National Biography*, "HAAK," "GLISSON," "WALLIS."

(14) In HEARNE : *Works*, vol. III, p. clxiii.

(15) STIMSON : "Dr. WILKINS and the Royal Society," *Journal of Modern History*, (Dec. 1931), vol. III, No. 4, pp. 539-563.

(16) WILKINS : *Mathematical Magick* (5th edition, London, 1707), "Dedication."

forthcoming book on the scientific societies of seventeenth century France, Dr. HARCOURT BROWN calls attention to the correspondence between the French Minorite, Père MERSENNE (1588-1648) and HAAK on scientific matters that began as early as 1639 and shows HAAK even then as a channel of communication between the science-lovers of France and of England (17). If it was the influence of COMENIUS upon HAAK that had stimulated him to suggest the Invisible College, why did he delay doing so until three years after COMENIUS had left England? The true influences upon HAAK and upon the Invisible College seem to be the same ones that were stimulating similar groups of science-lovers on the continent, whether in Florence at the Cimento or in France in the Cabinet of the brothers DU PUY and in MERSENNE's circle,—a desire to promote natural knowledge by experimental methods, combined with the leadership and the patronage of strong personalities.

It seems, therefore, that the Invisible College met in 1645 not because COMENIUS had visited England but because some young professional men with common interests and backgrounds and rather close if not conspicuous connections with the momentous questions of the day, being weary of those same problems, sought recreation and refreshment weekly in philosophical inquiries at a small informal club; as WALLIS says, "where (to avoid diversion to other discourses, and for some other reasons) we barred all Discourses of Divinity, of State-Affaires, and of News (other than what concern'd our business of Philosophy)..." (18) In modern phrasing they barred shop-talk, politics and the latest news from the front; for 1645 saw the battle of Naseby and civil war had already been in progress for three years. What really interested them were the subjects they had perhaps been discussing in the universities and with their friends on the continent and at home, such matters as recently published books and newly devised instruments—topics comparable to those HAAK and MERSENNE had been writing about for at least six years before the College began its meetings.

Why they avoided the topics they banned can be easily inferred

(17) BROWN : *Op. cit.*, chap. 3, and appendix A.

(18) *Defence*, p. 7.

from the vivid autobiography of one of their contemporaries. RICHARD BAXTER, the noted non-conformist divine, writing in 1664 about his experiences twenty years or so earlier, states: "While I lived here [Coventry in 1643] in Peace and Liberty, as Men in a dry House to hear the Storms abroad, so did we daily hear the news of one Fight or other, or one Garrison or other won or lost... So that hearing such sad news on one side or other was our daily work; insomuch that as duly as I awakened in the morning I expected to hear one come and tell me 'Such a Garrison is won or lost...' And 'do you hear the news' was commonly the first Word I heard..." (19) After Naseby, BAXTER visited CROMWELL's army, and finding what he thought to be a dangerous shift in its members' opinions he deemed it necessary to serve as preacher to the troops; for, he wrote: "they made it too much of their Religion to talk for this Opinion or for that; sometimes for State Democracy and sometimes for Church Democracy; sometimes against Forms of Prayer, and sometimes against Infant Baptism (which yet some of them did maintain); sometimes against Set-times of Prayer, and against the tying of ourselves to any Duty before the Spirit move us; and sometimes about Free-grace and Free-will and all the points of Antinomianism and Arminianism... But their most frequent and vehement Disputes were for Liberty of Conscience, as they called it; that is, that the Civil Magistrate had nothing to do to determine of anything in Matters of Religion by constraint or restraint, but every Man might not only *hold* but *preach* and *do* in Matters of Religion what he pleased. That the Civil Magistrate hath nothing to do but with Civil Things, to keep the Peace, and protect the Church's Liberties." (20) In the face of such discussions by CROMWELL's troopers surely the Invisible College did well to bar all "Discourses of Divinity, of State Affaires, and of News." We who have lived through the years 1914-1918 have some comprehension of the bitter weariness of fratricidal dissensions and of the pressing need at such times for less inflammable topics of conversation.

(19) *Reliquiae Baxterianae: Or Mr. Richard Baxter's Narrative of the Most Memorable Passages of his Life and Times*, published by Matthew Sylvester, (London, 1696), p. 46.

(20) *Ibid.*, p. 53.

The approach to truth and knowledge taken by the Invisible College was definitely through experimentation. In 1645 WILKINS and his friends at their weekly meetings “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 Telescopes, and Grinding of Glasses for that purpose... the weight of the Air, the Possibility or Impossibility of Vacuities, and Nature’s 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 but new Discoveries, and others not so generally known and embraced as now they are.” (21) Possibly the following passage from WILKINS’s first book *Discovery of a World in the Moone* illustrates the vigor with which these new topics would be discussed: “But here’s the mystery of it, wee first tie ourselves unto ARISTOTLE’S Principles, and then conclude that nothing could contradict them but a miracle, whereas twould be much better for the Common-wealth of learning, if we would ground our Principles rather upon the frequent experiences of our owne, then [*sic*] the bare authority of others.” (22)

COMENIUS, on the other hand, whatever his interest in nature as a part of his educational program was absorbed in the study of language as the gateway to knowledge. And science to him was knowledge. The education of all children regardless of sex or of condition was his concern, and his aim “was to simplify and shorten, by a kind of royal road to learning, all studies, arts and sciences.” (23) How best could the program of the schools be modified, particularly through the study of languages learned in relation to real objects, and the schoolroom be freed from the pedantry of mediaeval scholasticism? Though the study of nature had value and a place in his educational system,

(21) WALLIS : *Defence*, pp. 7-8.

(22) WILKINS : *Discovery of a World in the Moone* (London, 1638), p. 175. [A printer’s error : should be p. 177.]

(23) CROSSLEY, quoted by DIRCKS : *A Biographical Memoir of Samuel Hartlib, Milton’s Familiar Friend* (London, 1865), p. 52.

COMENIUS's own interest was not in exploring the new regions opened up by GILBERT, GALILEO, TORRICELLI, HARVEY and many others. Greatly as BACON's *Novum Organon* may have influenced his thinking, he seems to "have failed to appreciate that the one important point in the Baconian philosophy was the insistence on experiment and verification as a basis for sound induction." (24) Thus in his *Great Didactic* where he discusses the proper teaching of the sciences, of the arts, of morality and of piety, he defines science as the knowledge of nature through internal perception derived from the object to be observed and the light by which to observe it. "Therefore the youth who wishes to penetrate the mysteries of the sciences must carefully observe four rules: He must keep the eye of his mind pure; he must see that the object be brought near to it; he must pay attention; he must proceed from one object to another in accordance with a suitable method. For thus he will apprehend everything surely and easily." (25) Thus should science be taught in the schools. As the culmination of this graduated course of instruction the ablest should proceed to the School of Schools or Didactic College where learned men would work together "to thoroly establish the foundations of the sciences, to spread the light of wisdom throughout the human race with greater wisdom than has hitherto been attained, and to benefit humanity by new and useful inventions; for unless we wish to remain stationary or to lose ground, we must take care that our successful beginnings lead to further advances... This University College therefore will bear the same relation to other schools that the belly bears to the other members of the body, since it will be a kind of workshop, supplying blood, life and strength to all." (26) Yet COMENIUS sought to refute the Copernicans and the Cartesians, for his friend PELL wrote (probably to HARTLIB) about COMENIUS's loss of his papers in a fire: "I should have been willing to read over his refutations of the Copernicans and Cartesians but with that prejudice that I do not believe him to be a competent judge of all the differences

(24) KEATINGE: *The Great Didactic of John Amos Comenius*, trans. into Eng. and edited with biographical, historical and critical introductions (two parts, London, 1921), Part I, p. 36.

(25) *Ibid.*, Part II, chap. 20.

(26) *Ibid.*, Part II, chap. 31.

between them and other writers. And therefore of all his papers, there is none for whose loss I am less sorry" (27)... Verification, the essence of the experimental method, nowhere appears in the *Great Didactic* where COMENIUS discusses the place of the sciences in the schools. On the other hand, verification lies at the basis of the work of the Invisible College; and the motto of its successor, the Royal Society, "Nullius in Verba," reflects the virtuosi's rejection of authority unsupported by experimental evidence. The virtuosi were eager to investigate for themselves the recent discoveries of GALILEO, TORRICELLI, HARVEY and the other brilliant workers of that age. So quite naturally it is the bust of FRANCIS BACON, the exponent of the inductive method,—not that of COMENIUS—that appears in the frontispiece of SPRAT's *History of the Royal Society* in 1667, the account officially approved by the Society itself; and it is BACON's name rather than that of COMENIUS that figures repeatedly in the writings of these men as the source of their inspiration (28).

If COMENIUS's visit really had resulted in the formation of the Invisible College, why was not SAMUEL HARTLIB, COMENIUS's friend and sponsor in England, an important member; particularly since HARTLIB was well known to many of the members, as for example BOYLE, WILKINS, PELL, and PETTY? Not only is HARTLIB not mentioned in the contemporary accounts of the Royal Society and its origins, but his biographer considers it very doubtful that he was ever connected with the Society for "he was not an experimentalist and was an unlikely person to have original views" on the subjects discussed (29). DIRCKS continues: "His correspondence with its several members does not confirm the supposition that it was organized on any plan of his suggesting, and assuming the contrary, his own silence on the subject is the more remarkable, for success was not the crowning feature of the many benevolent schemes he suggested; although on the other hand, much is due to his untiring energy in keeping alive designs he had in view and inciting in others the same ambition to carry them into effect under more favorable circumstances even after his own career of usefulness should be brought to a

(27) *Ibid.*, Part I, p. 88.

(28) SPRAT, *Op. cit.*, p. 35.

(29) DIRCKS : *Op. cit.*, p. 20.

close.” (30) In a letter to Dr. WORTHINGTON soon after the first meetings for the Society’s organization (December 17, 1660), HARTLIB wrote: “at least the Author and Founders walking in the Light, we shall know from Time to Time how this proposed Affair is Managed by Them. Lord SKYTTE, a Swedish nobleman of Senatorian Rank in that Kingdom, is one; who it seems, hath devoted the spending of his Life and Estate after this Manner. His Excellency (for so he is called) sent me Word that shortly he would wait upon me, which I dare not own; but I suppose he intends to come and see me in my own Lodging. If he does so, I suppose I shall know the whole Design more fully. I received the Papers without Explication; so that I do but guess, that one of the Papers contains the Propositions which were made to his Majesty by the Lord SKITTE, and the other a Draught for the Royal Grant or Patent which is desired for the establishment of this Foundation. Thus much is certain, that there is a Meeting every Week of the Prime Virtuosi, not only in Gresham College in Term Time, but also out of it at Mr. BALL’s Chamber in the Temple. They desired his Majesty’s leave, that they might thus meet, or assemble themselves at all Times; which is certainly granted. BOYLE, Sir PAUL NEALE, Viscount BOUNCKER are some of the members. WREN is chosen Register (31). I look upon this Society as a previous Introduction of the Grand Design here represented. His Majesty is said to profess himself one of these Virtuosi.” (32) Such a letter indicates interest and knowledge, even sympathy, but certainly not consideration by the writer himself as one of the group about whom he is writing, or surely he would have written “we” instead of “they” (33).

(30) *Ibid.*, p. 20-21. Dr. JOHN FULTON in his “The Rise of the experimental Method” (*Yale Journal of Biology and Medicine*, March 1931, p. 305) has listed HARTLIB among the virtuosi meeting in 1645; but the evidence does not support this assertion of membership.

(31) At that first meeting not WREN but CROONE “though absent” was chosen register. BIRCH: *History of the Royal Society* (4 vols., London, 1756-57), vol. I, (Nov. 28, 1660); SPRAT, *Op. cit.*, p. 94.

(32) KENNET: *A Register and Chronicle Ecclesiastical and Civil, containing Matters of Fact, Delivered in the Words of the most Authentick Books, Papers and Records, Digested in Exact Order of Time* (London, 1728), p. 868.

(33) Later HARTLIB wrote to WORTHINGTON (Jan. 1, 1660-1); “Lord SKYTTE desires to come to me to confer about his Design. He is one of the Virtuosi; so is Mr. BRERETON. Mr. BOYLE, one of them, told me that for the present they

Besides not being himself one of the Royal Society fellows, HARTLIB had a dream of his own for various parts of which he sought support throughout the twenty years of his life that followed the publication in 1641 of his ideal commonwealth. In His *Description of the Famous Kingdom of Macaria* according to his biographer (34) he dreamed of a happy region where would be united "the great, the wealthy, the religious and the philosophical" and where there would be formed a "common centre for assisting and promoting all undertakings in the support of which mankind was interested." Later on he centered his attention on a college of husbandry, which was part of the general scheme. Furthermore he planned a college called "Atlantis" described in his *Memorial for the Advancement of Universal Learning*, and he offered with JOHN DURY to receive in trust any sums of money for this purpose that well affected persons and lovers of the public good were pleased to give. It seems likely that these schemes were the ones for which BOYLE offered encouragement in the following (undated) letter to HARTLIB: "I am sure that you have too much charity to want justice; and therefore on the score of your promise I am bold, not only to desire, but to expect at your hands a *Mercurius Philosophicus*, in an account of the projects and successes of that college, whereof God has made you hitherto the midwife and nurse... And since you do not disdain the meanest workman, that is but willing to lay some few stones towards the building of your college, I shall in my following epistles (If this procure them a pass) take the liberty to acquaint you with what thoughts and observations of mine I shall judge useful in reference to so glorious a design; to which I shall think it very much my happiness, if any endeavours of mine can have the honour in the least measure to contribute, not only as they owe a duty to the public (though I must confess, that of itself a very prevalent motive) but because I know you so vastly affectionate to that public, that my invention will furnish me with no fitter way, than that of my services to

are removed from Gresham College to Dr. GODDARD's Lodgings. He offers to contribute to it." Three months later he added (April 2, 1661): "There comes nothing of Lord SKYTTE's Business, and I believe the other Virtuosi will not have it that it should go forward." KENNET, *Op. cit.*, pp. 868, 870.

(34) DIRCKS: *Op. cit.*, pp. 16-18.

it, to give you real and accepted testimonies of my being, etc.” (35) And HARTLIB probably had these same plans in mind when he wrote to Boyle on August 10, 1658 complaining that WILLIAM PETTY’s proposals for a college had cost him some £ 250 a year, “by undermining that more universal design for learning upon which I have been made to hope these two years.” (36)

In an age that dreamed of a New Atlantis and of the possibility of new worlds in the moon, when thoughtful men like EVELYN and PETTY were suggesting schemes for the extension of knowledge, and when even the Commonwealth parliament was considering the advisability of reorganizing the old universities and of establishing a new one at Durham, the dreams of COMENIUS would seem to harmonize more with those of HARTLIB than with the philosophical pursuits of the virtuosi belonging to the Invisible College. Hence WALLIS’s account still stands as the authentic version of the meetings in 1645, supported as it is in many details by AUBREY and ANTHONY WOOD. As WOOD wrote, those meetings began “not as a foundation for a Society but merely for diversion sake in an innocent and virtuous manner.” (37) That HAAK who knew COMENIUS was the one to suggest the meetings seems a coincidence rather than a connection, particularly in the light of HAAK’s previous years of correspondence with the French science-lovers through MERSENNE, and in view of the fact that HARTLIB, COMENIUS’s chief sponsor in England, was not one of the virtuosi. It does not seem probable, therefore, on the basis of the existing evidence that the visit of COMENIUS to England in 1641-2 marks an “important stage in the development of the idea of a great institution for scientific research” (38).

How far in the years before the Civil War the Puritan temper found an outlet for its vigor in scientific investigation as well as in political and theological discussion is a problem requiring the review of much more evidence than it has been possible to present in this brief study. Mention is made of this theory only to

(35) BOYLE : *Op. cit.*, vol. I, pp. xlvi-xlvii.

(36) *Ibid* : vol. VI, p. 113.

(37) WOOD : *History and Antiquities of Oxford* (edited by GUTCH, 2 vols., Oxford, 1786), Vol. II, Part II, pp. 632-33.

(38) YOUNG : *Op. cit.* pp. 6-7.

suggest an influence for the advancement of scientific work in England of far more importance, perhaps, than the educational theories of COMENIUS.

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